

The elements of variation:
format, locus and acquisition of
parametric properties.

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Origins

“Even if conditions are language- or rule-particular, **there are limits to the possible diversity of grammar. ... [cross-linguistically variable] conditions can be regarded as parameters that have to be fixed** (for the language, or for particular rules, in the worst case), **in language learning.** ... It has often been supposed that conditions on application of rules must be quite general, even universal, to be significant, but that need not be the case if establishing a “parametric” condition permits us to reduce substantially the class of possible rules”

N. Chomsky, 1975, “Conditions on rules of grammar”,
republished in Chomsky 1977, 175.

Origins

(1) Ecco un incarico [che [_S non so proprio [s'a chi [_S potremmo affidare ____]]]]

'Here is a task that I really don't know to whom we could entrust'

(2) *Das ist eine Aufgabe, [die [sich wirklich nicht weiss [wem [swir ____ anvertrauen koennten]]]].

'Here is a task that I really don't know to whom we could entrust'

(3) *Ecco un incarico [che [non so proprio [s a chi [si domandino [s se [potremmo affidare ____ ____]]]]]]

'Here is a task that I really don't know to whom they wonder if we could entrust'

(4) Subjacency: ... X ... [_{BN} ... [_{BN} ... Y ...



(5) Bounding nodes for Subjacency are parametrized (Rizzi 1978)

Principles and parameters

Principles and Parameters Model (Chomsky 1981)

- UG: a system of principles and parameters;
- PG: UG with parameters set in a particular way.
- Acquisition: parameter setting

Consequences:

- A powerful technical language for doing comparative syntax;
- ... and for studying the acquisition of syntax, reduced to an operation of selection of parametric values.

The initial view on the format and locus of parameters

It is useful to distinguish between the **format** and the **locus** of parameters.

As the first parameter looked like an option specified on a principle, it was natural to start with the assumption that principles represented the **locus** for parameters in general: so, perhaps each UG principle would specify one (or a small number of) parameter(s).

This gave rise to the expectation that there would be a **small number** of parameters, because the number of UG principles is small.

Parameters as specifications on principles: the format

(12) Not much attention was paid initially to the **format** of parameters. As patterns of variation started being explored, this initial conception gave rise to a collection of statements like the following:

- the bounding nodes are... (Rizzi 1978, Sportiche 1981,...)
- null subjects are licit, (Taraldsen 1978, Rizzi 1982,...)
- *believe* type verbs select an IP (English vs. Romance: Chomsky 1981)
- P assigns structural/inherent Case (P-stranding,...Kayne 1981)
- the head precedes/follows the complement,
- V moves to I (Emonds 1978, Pollock 1989),
- V moves to C (V-2 Germanic: Den Besten 1977/1982)
- Nominative is assigned under agreement (SVO) or under government (VSO: Kooman & Sportiche)
- there are long-distance anaphors (English vs Icelandic, etc., Manzini & Wexler)
- wh-movement is overt or covert... (English vs Chinese, etc.Huang 1983)
- the language is non-configurational (K. Hale 1983)

Some problems with the model of “parameters as specifications on principles”

- The arbitrary-looking character of the list of the first parameters (if any aspect of UG can be parametrized, the notion isn't of great help to facilitate the task of the language learner).
- Some principles didn't appear to be parametrized at all (hierarchical principles of X'-theory, the Theta Criterion, Principle C,...);
- Some parameters appeared to be directly keyed to the presence of particular lexical items: e.g., long-distance anaphora is not a global grammatical property, but depends on the presence of specific LD anaphors (Icelandic *sig*, etc), specified as such in the functional lexicon.
- Other global parameters like non-configurationality seemed to be advantageously reanalyzable as conglomerates of more elementary parameters.

Parameters as specifications in the functional lexicon

A significant shift in the conception of the **locus** for parameters was to think of parameters as specified not directly on UG principles, but rather as featural specifications in the (functional) lexicon.

- (15) “The inventory of inflectional rules and of grammatical formatives in any given language is idiosyncratic and learned on the basis of input data. If all interlanguage variation is attributable to that system, the burden of learning is placed exactly on that component of grammar for which there is strong evidence of learning: the vocabulary and its idiosyncratic properties”

Borer (1984), 29

On the **format** and **locus** of parameters in current models.

A parameter is an **instruction for a certain syntactic action** expressed as a feature on an item of the functional lexicon and made operative when the item enters syntax as a head.

So, the general **format** for parameters becomes something like the following, where H is an item of the functional lexicon, and F is a morpho-syntactic feature expressing an instruction for a syntactic actions:

(1) **H has F {yes, no}**

The **locus**: the functional lexicon.

UG and parameters

UG specifies:

1. The functional lexicon H : $\{H_1, \dots H_n\}$;
2. The list of syntactic actions;
3. The list of features triggering syntactic actions F : $\{F_1, \dots F_m\}$;
4. The format “ H_i has F_j ”.

So, we have:

- Merge parameters;
- Move parameters (Search, Internal Merge);
- Spell-out parameters;

The child assigns the appropriate subset of F to each functional item on the basis of experience.

A typology of parameters: merge parameters

1. Merge parameters:

- Categorical selection parameters: H c-selects XP (where XP departs from the canonical structural realisation of the s-selected entity: Grimshaw 1979, Pesetsky 1983, etc.). E.g., v_{epist} in certain languages (*believe* in English vs *credere* in Italian); causative verbs, perception verbs taking “pseudo relatives”, etc.
- “Cartographic” parameters: Cross-linguistically variable orders in the functional hierarchies: NegP in the CP zone, or in the high, intermediate or low IP zone (Zanuttini 1998, Cinque 1999, Moscati 2010); types of Agreement heads (Shlonsky 1987, Cinque 1999, Belletti 2001); types of subject positions (Cardinaletti 2004, Moro 1997, Shlonsky 1989), Topic single or recursive, Focus in the high and/or low periphery, specialized to new information or contrast (Rizzi 1997, 2004, Belletti 2001, 2004).
- Ordering parameters. Harmonic and disharmonic systems (apparently with inviolable restrictions: Biberauer, Holmberg, Roberts 2008 FOFC and related markedness assumptions). (NB: these are movement parameters in the system of Kayne 1994).

A typology of parameters

2. Move parameters:

- H attracts X[+F]: V to I; I to C; VSO order; N to D, N to V incorporation (Baker 1988), P to V incorporation, cliticisation,...
- H attracts XP[+F]:
 - to satisfy Case-agreement properties,
 - to satisfy criterial properties,
 - to rearrange elements phase-internally (snowballing, etc: Cinque 2005, nanosyntax approaches as in Starke 2011.), etc.

3. Spell-out parameters:

- H is null: functional heads of the IP, CP, DP systems,....
- H licenses a null Spec. Topic Drop, Null Subject, Null Object, various kinds of ellipsis (reducible to a movement parameter in Kayne's 2005 approach),...

On the numerosity of parameters

In this conception, the size of the set of parameters is determined by the size of the functional lexicon.

So, parameters are much more numerous than in the original model.

Even more so if cartographic studies are right in assuming a very rich functional structure: Rizzi 1997, ed. 2004, Cinque 1999, ed. 2002, Belletti ed. 2004, Cinque & Rizzi 2010, etc.).

NB: About 170 grammaticalization targets identified by Heine and Kuteva (2002) give a very conservative estimate of the size of the functional lexicon.

Is this a problem?

Critique 1: Many parameters = an unrestricted space of variation

Critique 1: The term “parameter” suggests a highly restrictive space of variation. But a system with many parameters is a kind of *reductio ad absurdum* of the very idea of parametric syntax. So, the current conception is sometimes seen as an undeclared retreat to the EST conception of grammars as systems of language-specific rules (Newmeyer 2005).

Reply 1: Here the distinction between the **locus** and the **format** of parameters becomes crucial: under the current conception, the loci of parameters are numerous and diverse, but the format is extremely restrictive, as determined by the restrictiveness of minimalist syntax. So, the parametric space is radically more restricted than the space of possible language-specific rules in EST models (which in fact permitted an infinite number of rule systems).

Critique 2: local parameters = shallow deductive structure


Critique 2: if all parameters are local, they will have only local consequences, hence the theory of variation will have a very shallow deductive structure.

Reply 2: No, parametric property are always local, but if they are expressed in proximity of crucial ganglia or crossroads of syntactic structure, then they will interact with principles in complex ways and determine systemic consequences

Consider, e.g., the evidence steadily accumulated over the last 30 years that the *wh* subject is not extracted from the highest subject position in Italian (ne-cliticization, Q-scope, Agr- and subj clitic patterns, Case properties, Q-float, etc.), thus validating the following analysis:

Subject extraction in Italian

(1) Chi credi [che [*pro* Subj verrà ____]]



(2) Rizzi & Shlonsky 2007:

- The Subject Criterion (→ EPP)
- Criterial Freezing (→ main ECP effects)
- The Null Subject parameter

(3) NSP → Expl *pro* → formal satisfaction of Subject Criterion (EPP) → the thematic subject can “skip” the criterial position, thus avoiding a violation of Criterial Freezing → it can be extracted from a lower position (NOT from the lower focus position (Belletti 2004) of “free” subject inversion).

So: local parameters can have systemic consequences through complex deductive chains.

Critique 3: many local parameters = weak or null predictive power on cross-linguistic patterns of variation

Reply 3: No, if possible interacting factors are controlled for.

In fact, the predictive power of the system emerges in full in two situations:

- In macro-comparative studies, when one deals with relatively isolable subsystems, e.g., in Cinque's (2005) work on the order of elements in DP's (Greenberg 1963's Universal 20: various orders of Dem Num A N are strictly excluded with N final: *Num Dem A N, *Num A Dem N ,...).
- Through the microcomparison of historically very close grammatical systems, e.g., in the cases provided by dialectological studies (or register studies), the closest approximation to a controlled experiment in comparative syntax (Kayne 2000).

Macro- and micro-comparative studies

- microcomparative studies give us a window on the fine details of variation and make the identification of irreducible parameters a more feasible enterprise, and
- Macrocomparative studies give us the grand picture of cross-linguistic variation.

... so we need both!

Appendix:

Two hypotheses on the acquisition of cross-linguistically variable properties.

- The “UG” hypothesis: the child has abstract grammatical representations early on, expressed in terms of principles and parameters . Parameter fixation is rapid and on the basis of limited evidence (e.g., Wexler 1997).
- The “constructivist” hypothesis: initially the child stores in memory individual items with the associated syntactic environments. Only at later stages does the child generalize through analogy from memorized fragments to abstract notions such as general word order properties, etc. (e.g., Tomasello 2000).

Results from corpus studies

- Corpus studies show that, already in the two-word stage, the child produces structures that express the basic word order of the language:

VO in child English, French, etc.

OV in child Japanese, Turkish, etc.

Two hypotheses on the acquisition of word order properties

“UG” approach: early production manifests early parameter fixation, and early abstract grammatical knowledge.

“Constructivist” approach: the child memorizes fragments she hears and repeats them. No abstract knowledge initially. Abstract knowledge arises later through analogical generalisation.

The two approaches make crucially different predictions **on the child’s capacity to generalize her knowledge to new items and structures around the two –word stage.**

J. Franck, S. Millotte, A. Posada, L. Rizzi (2011) Abstract knowledge of word order by 19 months: An eye-tracking study.
In press in Applied psycholinguistics.

In order to tease apart “UG” and the “constructivist” approaches in comprehension, we conducted an experiment combining:

- The “preferential looking” paradigm;
- Pseudo-verbs (jabberwocky) .
- The “weird word order” paradigm (grammatical N V N and ungrammatical N N V in French)

Linguistic stimuli

In the experiment, the 19 months old child acquiring French hears both grammatical N V N sentences with pseudoverbs:

(1) Le lion poune le cheval
'The lion punes the horse'

and ungrammatical N N V sentences with pseudoverbs:

(2) * L'âne le chien dase
'The donkey the dog dases'

Condition	Audio sentence	Video 1 Transitive action	Video 2 Intransitive action
NVN	<p>Le lion pousse le cheval</p> <p><i>The lion is pushing the horse</i></p>		
NNV	<p>L'âne le chien dase</p> <p><i>The donkey the dog is dasing</i></p>		

J. Franck, S. Millotte, A. Posada, L. Rizzi (2011) Abstract
knowledge of word order by 19 months: An eye-tracking study.

Participants:

18 infants aged 19 months (age range: 1;7-1;8) with native
French mothers

6 experimental sentences:

- 3 grammatical (NVN) with pseudo-V 'pouner'
- 3 ungrammatical (NNV) with pseudo-V 'daser'

Each sentence illustrated by 2 simultaneous videos:
transitive action & intransitive/reflexive action

Predictions

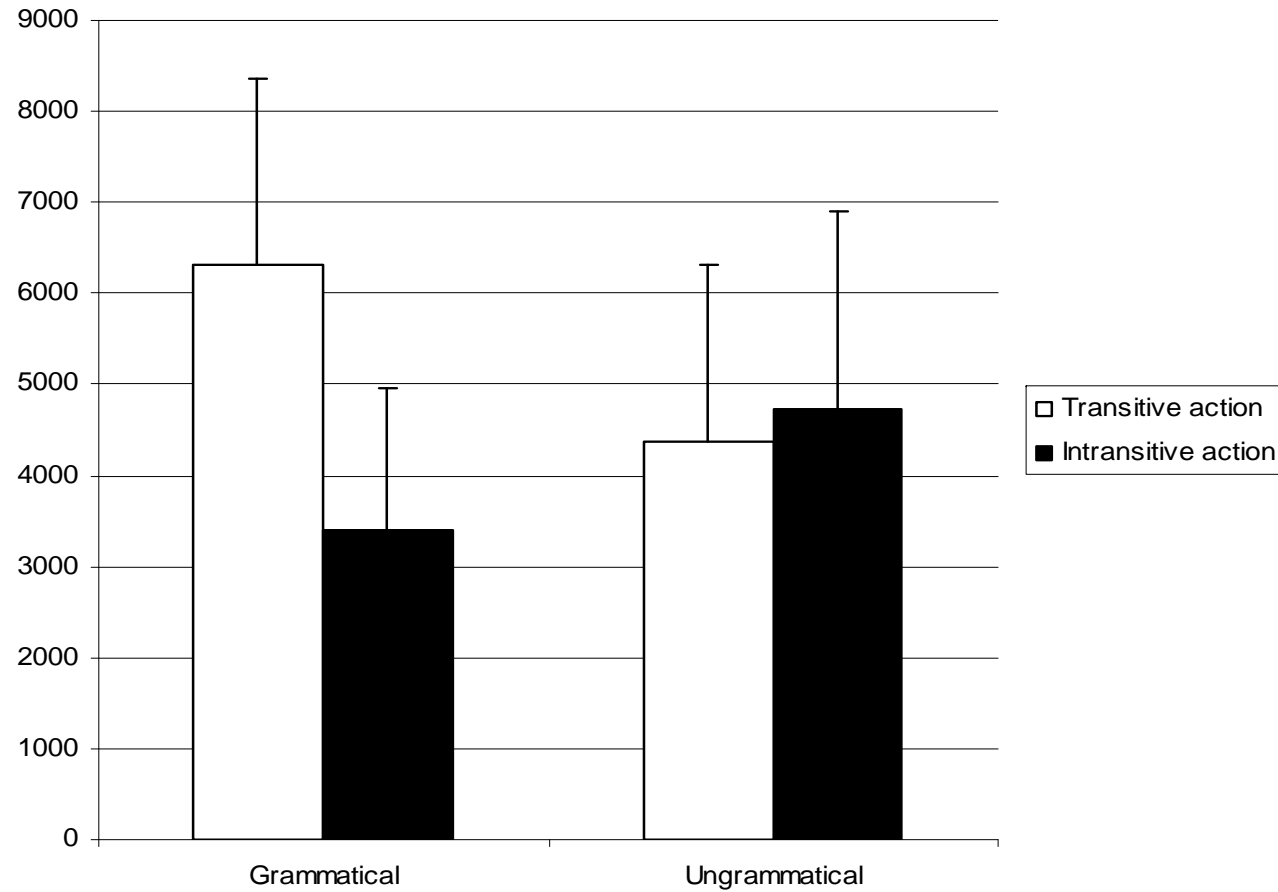
“UG” approach: the child has the abstract knowledge that the language is SVO; so, she immediately interprets the N V N sentence with a novel verb as a transitive action, and it is expected that she will look more at the transitive video.

The N N V sentence is not amenable to any abstract grammatical structure, hence no preference is expected here.

“Constructivist” approach: the child does not have any abstract word order knowledge, so no preference is expected in either case.

Results

J. Franck, S. Millotte, A. Posada, L. Rizzi (2011) Abstract knowledge of word order by 19 months: An eye-tracking study.



Conclusions

Infants at 19 months exposed to French sharply differentiate N V N and N N V structures with new verbs, so they appear to have abstract knowledge that the language they are exposed to is SVO.

This is not expected under the “constructivist” approach, which assumes concrete, item-based knowledge at this stage.

The evidence thus supports the “UG” approach, which assumes early abstract knowledge in the form of a UG parameter fixed early on.

Thank you