Language history and parameter setting

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1. The Parametric Comparison Method (PCM)

2. Linguistic Theory and the calculations of language distances

3. Phylogenetic Trees

4. The implication for Parameter Theory and Parameter Setting
The Parametric Comparison Method (PCM)

Guardiano and Longobardi (2005), Longobardi and Guardiano (2009)
1. The Parametric Comparison Method (PCM)

- **Parameter** values can be used as *comparanda* for **historical reconstruction**
- **Syntactic diversity** can be **quantified as a distance measure**
- **Computational taxonomies** purely based on syntax can be generated and validated

Longobardi (2003), Guardiano and Longobardi (2005), Longobardi and Guardiano (2009)
1. The Parametric Comparison Method (PCM)

The PCM has been successfully used to explore:

- The Historical classification of Indo-European languages
- The Historical classification of 28 languages spoken in Eurasia
- The analysis of syntactic microvariation in Southern Italy

Longobardi et al. (2013), Guardiano et al. (2016), Longobardi et al. forthcoming
A crosslinguistic syntactic difference is a binary parameter if and only if it entails:

❖ The presence of obligatorily formal expression for a semantic or morphological distinction (the obligatory valuing of an interpretable or uninterpretable feature)

❖ The variable form of a category depending on a syntactic context (Selection and Feature Agreement)

❖ The position of a category (Overt Movement)

Guardiano and Longobardi (2016)
Our data encode properties of the DP, such as:

- The status of features associated with D, e.g. *person, number, gender and definiteness*
- Syntactic properties of adjectives, relative clauses, genitival arguments and possessives, demonstratives
- Type and scope of N-movement

Guardiano and Longobardi (2016)
Linguistic Theory and the calculations of language distances
2. Linguistic Theory and the calculations of language distances

A formal model: Principles and Parameters Theory

“The P&P model is in part a bold speculation rather than a specific hypothesis. Nevertheless, its basic assumptions seem reasonable…. and they do suggest a natural way to resolve the tension between descriptive and explanatory adequacy’

Chomsky (1995)
In order to quantify syntactic distances, one can simply count differences in setting:

\[
\begin{align*}
    d(A,B) &= \frac{2}{3} \\
    d(B,C) &= \frac{1}{3} \\
    D(A,C) &= \frac{1}{3}
\end{align*}
\]

This is a \textit{Hamming} distance

Longobardi and Guardiano (2003) and Guardiano and Longobardi (2005)
2. Linguistic Theory and the calculations of language distances

A problem: implications (e.g. grammaticalization of functional projections)

\[ d(A,B) = \frac{1}{2}, \text{ not } \frac{2}{3} \]
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\[ D(A,C) = \frac{1}{3} \]

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Longobardi and Guardiano (2003) and Guardiano and Longobardi (2005)
‘[...] the notion of parametric dependencies runs into empirical problems that should cast doubt on the feasibility of parametric approaches to UG.’

Boeckx and Leivada (2013), Longobardi et al. (2015)
The Borer–Chomsky conjecture

“All parameters of variation are attributable to differences in the features of particular items (e.g., the functional heads) in the lexicon.”

2. Linguistic Theory and the calculations of language distances

Parameter Schemata

- Is F, F a feature, grammaticalized?
- Does F, F a grammaticalized feature, Agree with X, X a category (i.e. does F probe X)?
- Is F, F a grammaticalized feature, spread on X, X a category?
- Is F, F a grammaticalized feature, “strong” (i.e. does F overtly attract X, probe X with an EPP feature)?
- Does a functional category (a set of lexically co-occurring grammaticalized features) X have a phonological matrix Φ?
- Is F, F a grammaticalized feature, checked by the minimal accessible category of type X (or is pied-piping possible)?

Longobardi (2005)
2. Linguistic Theory and the calculations of language distances

In order to quantify syntactic distances, one should only consider the number of lexical features:

\[
d(A,B) = \frac{2}{2} \\
d(B,C) = \frac{1}{1} \\
D(A,C) = \frac{1}{2}
\]

This is a Jaccard distance (identities in ‘-’ are not counted)

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Phylogenetic trees

Longobardi and Guardiano (2009), Longobardi et al. (2013)
3. Phylogenetic trees
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<th>Jap</th>
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<td>FGP, gr. person</td>
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<td>FGN, gr. number</td>
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<td>NCL, clitic poss.</td>
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3. Phylogenetic trees

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<td>SGE, sem. gender</td>
<td>?</td>
<td>-</td>
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<td>ROF, Rel over N</td>
<td>?</td>
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<td>+</td>
<td>?</td>
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<td>PSC, Card. F. spread</td>
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The implication for Parameter Theory and Parameter Setting
4. The implication for Parameter Theory and Parameter Setting

- A first step towards simplification of parameter setting was the formulation of an ‘implicational structure’, for which parameters whose value can be deduced (‘0’) were removed from the computation, since they are not part of the mental representation of the language.

- Here we make a further step by claiming that also parameters which are set on (‘-’) are not always relevant, because they represent the ‘absence’ of a feature. They are only relevant when we count differences in the number of features, not identities.

- The only thing which is truly shared by languages are ‘+’ values, which represent the presence of a feature.
4. The implication for Parameter Theory and Parameter Setting

- The fact that this system provides more plausible phylogenetic results is a proof of the representation of grammars as lists of syntactic features.
THANKS!

Any questions?

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