# Categorial Acquisition by Differentiation

*The acquisition of the left periphery*
*and implications for categorisation*

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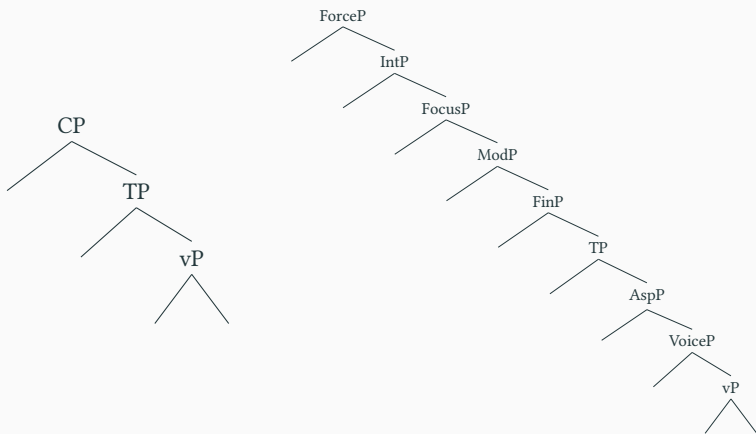🌐 nuria-bosch.github.io

BCGL 17 (CRISSP, KU Leuven)
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- This talk is about **categorisation** from an **acquisitional perspective**.

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- Acquisition of functional categories crosslinguistically – **three starting questions**:
  - (i) **Empirical** – Is there a specific order in which the functional spine is acquired crosslinguistically?
  - (ii) **Mechanistic, Dynamical** – How does syntactic categorisation proceed: is it pre-engineered (e.g., by UG) or (partly) emergent?
  - (iii) **Ontological** – Which syntactic categories are assumed throughout developmental stages? (e.g., cartographic) Are they 'adult-like' from the start?

- 'Traditional' answers to date:
  - **Continuity**: (almost) all adult-like functional structure available from the start, via UG.
    - ↪ Micro-cues model (Westergaard, 2009): sensitivity to cartographic CP early on.
  - **Maturation**: (predominantely) *bottom-up* development of a UG-given (adult-like) spine.
    - ↪ Growing Trees Hypothesis (Friedmann, Belletti, and Rizzi, 2021): cartographic CP fully accessibly late.

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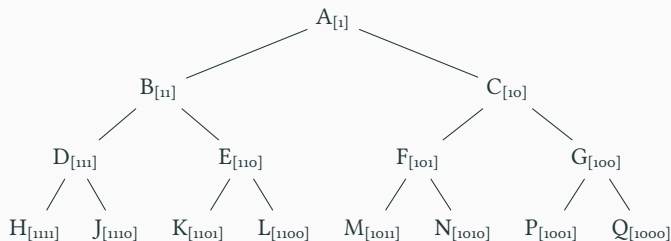
- Focus here   **Some motivations for revisiting these answers** (see Soares, 2006, for some early discussion)
  - Parsimony – cartographic structure available from the start?
  - Proposed language-specific differences in categorial inventories, e.g., Parametric Substantiation Hypothesis (e.g., Ritter and Wiltschko, 2014; Wiltschko, 2014).
  - Proposals for crosslinguistically variable degrees of elaboration of functional structure, e.g. the CP (i.a., Giorgi and Pianesi, 1997; Soares, 2006; Biberauer and Roberts, 2015; Hsu, 2017; Walkden, 2017; Larson, 2021).

- $\boxed{\textbf{Our contribution}}$ : probing the empirical productivity and versatility of different hypothesis on categorisation (CAD) and theoretical approach (neo-emergentism).

**Categorial Acquisition by Differentiation**

Syntactic categories *granularise* during development. Acquisition proceeds such that coarser-grained, featurally-simpler categories are acquired first, with later, finer-grained distinctions elaborating on developmentally-prior structure.

- **Categorial Differentiation** in abstract terms (Douglas, 2024). *Coarse* to *fine* development.

$$A_{[1]}$$

$$B_{[11]} \qquad\qquad C_{[10]}$$

$$D_{[111]} \qquad E_{[110]} \qquad\qquad F_{[101]} \qquad G_{[100]}$$

$$H_{[1111]} \quad J_{[1110]} \quad K_{[1101]} \quad L_{[1100]} \quad M_{[1011]} \quad N_{[1010]} \quad P_{[1001]} \quad Q_{[1000]}$$

↪ Observed, i.a., in conceptual development, categorisation, decision making, visual perception, biological development (i.a., Horton and Markman, 1980; Biederman, 1987; Han and Chen, 1996; Kozima, 2013; Wang, Yang, and Xu, 2017; R. Gordon and N. K. Gordon, 2019).

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    1. **Case study 1**: acquisition of the *cartographic* left periphery across 5 languages.
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  2. **Case study 2**: bilingual and monolingual acquisition of topicalisation crosslinguistically
     - ↪ 'Late' topics *not* a universal, rather *epiphenomenon* of formal complexity of topicalisation in each L1.

- We show: (i) this perspective uncovers productive generalisations, consistent with CAD; crucially, (ii) CAD provides a better empirical fit than existing approaches.

## The plan for today

1. Theoretical background

2. Differentiation as an acquisitional hypothesis

3. Two case studies

3.1   Case study 1: the acquisition of the (cartographic) CP

3.2   Case study 2: acquisition of topicalisation crosslinguistically

4. Implications and outlook

# Theoretical background

- **Maturation** of functional categories

  - (Arguably) **dominant** approach so far: **bottom-up** approach.
  - The top of the tree ($\approx$ **CP**) acquired **last** (Radford, 1990; Rizzi, 1993; Friedmann, Belletti, and Rizzi, 2021; Diercks et al., 2023).
  - Growing Trees Hypothesis (most recent, left periphery-centred proposal): two-stage development of LP.
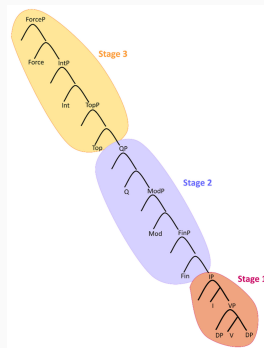


**Figure 1:** Stages in the Growing Trees Hypothesis (Friedmann, Belletti, and Rizzi, 2021, p. 12)

- **Maturation** of functional categories

  - More recently revived idea: **inward** approach. **CP** emerges **early**! (i.a., Galasso, 2003; Tsimpli, 2005; Heim and Wiltschko, 2021).
  - Galasso (2003)'s 'Empty Middle' approach: CP>Ø>VP to CP>IP>VP.
  - Heim and Wiltschko (2021)'s Inward Growing Spine: spine matures inwardly.
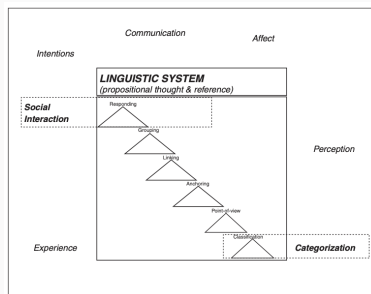


**Figure 2:** Bridge Model (Hinzen and Wiltschko, 2023)
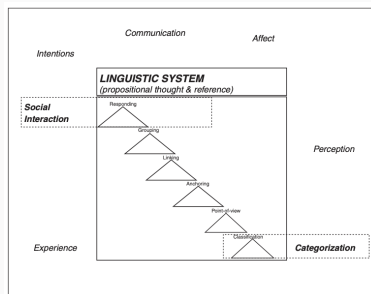
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**Figure 2:** Bridge Model (Hinzen and Wiltschko, 2023)

**Pre-wired (bottom-up or inwardly) development, fixed granularity**

- **Continuity**: children's initial state ≈ adult's functional inventory.
  - Of various strengths:
  - Strong Continuity (i.a., Poeppel and Wexler, 1993; Boser et al., 1992; Hyams, 1992)
  - Weak Continuity (Underspecification of features, Lexical Learning, etc.) (i.a., Hyams, 1996; Clahsen, Eisenbeiss, and Vainikka, 1994).
  - Westergaard (2009)'s <u>micro-cues</u> approach: sensitivity to cartographic structures early on.

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  **Same (adult-like) granularity throughout development**

- Hence, **commonalities** in (most) approaches to date:
  - *Implicit* theoretical commitment: **fixed granularity**.
    - ! Cartography advocates *fixed* and *fine-grained* functional sequences.
    - ! Range of work advocating different degrees of elaboration of the left periphery crosslinguistically.
    - → **Unaddressed Q:** Is the granularity of categorial systems fixed in development?

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  - *Implicit* theoretical commitment: **fixed granularity**.
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    - ! Range of work advocating different degrees of elaboration of the left periphery crosslinguistically.
    - → **Unaddressed Q:** Is the granularity of categorial systems fixed in development?
  - *Implicit* analytical focus: **developmentally universal patterns**.
    - **Maturation**: theoretical emphasis on universality – hard-coded acquisition orderings.
    - **Continuity** universality (again) – functional structure universally available from the start.
    - → **Unaddressed Q:** Which systematic patterns of developmental variation exist, and what conditions them?

$\rightarrow$ This talk: zooming in on these **two assumptions** of current approaches, with **two case studies**.

1. **Case study 1 – fixed or flexible granularity?**
   - Is the CP acquired early or late?
   - When do children show evidence that would motivate assuming an articulated CP domain in their grammars?

2. **Case study 2 – developmental variation in topicalisation**
   - How do we predict it with a universals-centred toolkit?
   - Implications for early/late CP maturation.

# Differentiation as an acquisitional hypothesis

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Syntactic categories *granularise* during development. Acquisition proceeds such that coarser-grained, featurally-simpler categories are acquired first, with later, finer-grained distinctions elaborating on developmentally-prior structure.

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- *Strong* **hypothesis**: expands on existing work arguing for granularity-aware linguistic analyses (i.a., Thráinsson, 1996; Bobaljik and Thráinsson, 1998; Giorgi and Pianesi, 1997; Dresher, 2009; Jaspers, 2012; Biberauer and Roberts, 2015; Song, 2019; Cournane and Klævik-Pettersen, 2023).

- But **takes it one step further**, arguing this **reflects *language acquisition*** (following Biberauer and Roberts, 2015; see also Soares, 2006).

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- But **takes it one step further**, arguing this **reflects *language acquisition*** (following Biberauer and Roberts, 2015; see also Soares, 2006).

- If true, we expect:
    - Coarser-grained categorial distinctions acquired *earlier* than finer-grained ones.

## Differentiation as an acquisitional hypothesis

- We draw on **neo-emergentist** generative approaches (see Biberauer, *et seq.*, 2011; Biberauer and Roberts, 2015).

↪ **Minimax nature** of acquirers → conservative when positing [$F$]s (**Feature Economy**); liberal in generalising already-existing ones (**Input Generalisation**).

(1)   The NO>ALL>SOME learning path

[$F$] present?

NO          YES: <u>All</u> heads?

YES   NO: Which <u>subset</u> of heads?

(Postulate a new [$F$])
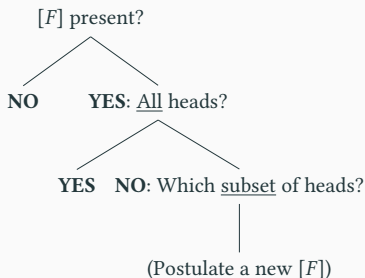
- **Case study 1** : Granularity/differentiation in *formal feature postulation*: emergent <mark>categorial</mark> hierarchy in Biberauer and Roberts (2015).
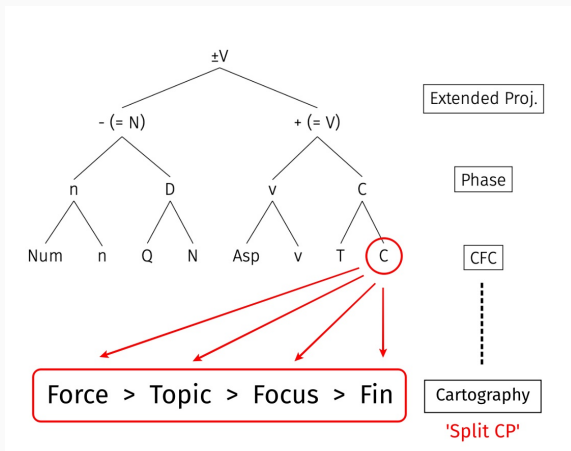
- **Case study 2** : Granularity/differentiation in *formal feature postulation*: emergent **parametric** hierarchies in Biberauer and Roberts (2015).

(2) Schematisation of emergent parameter hierarchies

# Two case studies

## Case study 1: the acquisition of the (cartographic) CP

- **Case-study 1** (Bosch, 2023a): emergence of **CP-structures** *vs* structures indicating command of a further articulated, **cartographic**-type CP ('**Split CP**' structures). **10 monolinguals, 5 languages**.

- **CP diagnostics**:
    1. Wh-questions
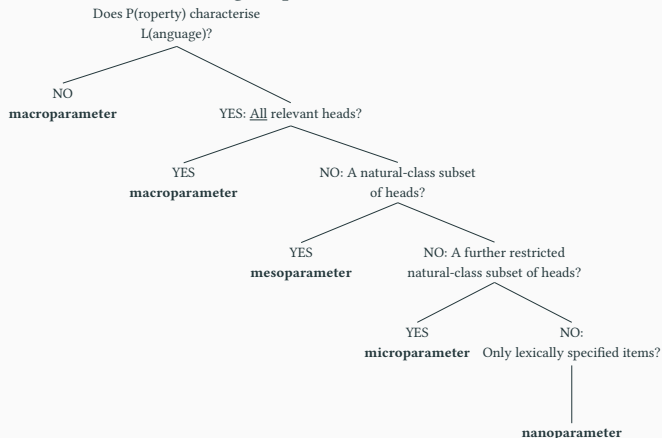    2. Yes/no questions (Germanic only)
    3. V-to-C movement (Germanic only)
    4. Topics/Foci
    5. Illocutionary (main clause) complementisers (Romance only)
    6. Finite embedding

- **Split CP diagnostics** (Romance):
    1. Top > Wh
    2. Top > Top/Foc
    3. Complementiser > Wh/Top
    4. Quotative *que* 'that' > Wh (Ibero-Romance only)
    5. Topic > interrogative que 'that' (Catalan only)
    6. *Sí que/sì che* 'yes that' and *que sí que* 'that yes that' structures (for the latter, Ibero-Romance only)

- **Rationale**: *Categorial granularity as an object of study*, not a *theoretical prior*.
  - Grant that various degrees of granularity may be needed to capture crosslinguistic typology of CP.
  - No specific granularity *assumed a priori* → 'Let the data decide'.
  - Inquires into 'earliness' of functional domains, but *also* their *granularity* throughout development.

- **Results**: *three Generalisations.* The first two: CP-structures (of various kinds) emerge early crosslinguistically.

> **Generalisation 1: Early Acquisition of CP**
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> CP structures emerge early on in the developmental data.

- **Results**: *three Generalisations.* The first two: CP-structures (of various kinds) emerge early crosslinguistically.

**Generalisation 1: Early Acquisition of CP**

CP structures emerge early on in the developmental data.

**Generalisation 2: Structural Height and Acquisition Mismatch**

There is a dissociation between structural height and order of emergence. Acquisition does not proceed successively upwards; some syntactically very high elements emerge early.

| Age | MLUw | Wh-Q | Top/Foc | Illoc | Embed | Split CP |
|---|---|---|---|---|---|---|
| 1;07.20 | 1.03 | | | | | |
| 1;09.07 | 1.09 | | | | | |
| 1;10.22 | 1.15 | | | ✓ | | |
| 1;11.12 | 1.15 | | | ✓ | | |
| 2;02.05 | 1.35 | | | ✓ | | |
| 2;02.13 | 1.3 | ✓ | | | | |
| 2;04.11 | 1.44 | ✓ | | | | |
| 2;05.08 | 1.64 | | | | | |
| 2;06.25 | 1.76 | ✓ | | | | |
| 2;07.20 | 1.78 | ✓ | | ✓ | | |
| 2;08.30 | 1.88 | ✓ | ✓ | ✓ | | |
| 2;11.17 | 1.98 | ✓ | ✓ | ✓ | | |
| 3;00.02 | 2.42 | ✓ | ✓ | ✓ | ✓ | |
| 3;03.21 | 3.47 | ✓ | ✓ | ✓ | ✓ | ✓ |
| 3;05.13 | 2.54 | ✓ | ✓ | ✓ | ✓ | ✓ |
| 3;10.00 | 2.97 | ✓ | ✓ | ✓ | ✓ | ✓ |
| 3;10.01 | 2.91 | ✓ | ✓ | ✓ | ✓ | ✓ |
| 3;11.12 | 3.0 | ✓ | ✓ | ✓ | ✓ | ✓ |
| 4;00.10 | 3.18 | ✓ | ✓ | ✓ | ✓ | ✓ |

**Table 1:** Production of structures by Laura (Catalan)

| Age | MLUw | V2 | Wh-Q | Y/N-Q | Top/Foc | Embed | Split CP |
|---|---|---|---|---|---|---|---|
| 1;06.16 | 1.12 | | | | | | |
| 1;07.21 | 1.17 | | Wh-less | | | | |
| 1;08.28 | 1.07 | | Wh-less | | | | |
| 1;09.10 | 1.17 | | Wh-less | | | | |
| 1;10.05 | 1.09 | ✓ | | | | | |
| 1;10.13 | 1.17 | | | | | | |
| 1;11.01 | 1.25 | | | | | | |
| 1;11.15 | 1.37 | | Wh-less | | | | |
| 2;00.17 | 1.88 | ✓ | | ✓ | ✓ | | |
| 2;01.10 | 1.88 | ✓ | | ✓ | ✓ | | |
| 2;02.18 | 2.11 | ✓ | | ✓ | | | |
| 2;03.26 | 2.05 | ✓ | | ✓ | | | |
| 2;04.02 | 2.53 | ✓ | | ✓ | ✓ | | |
| 2;04.09 | 2.34 | ✓ | | ✓ | | | |
| 2;04.27 | 2.46 | ✓ | | ✓ | | | |
| 2;05.09 | 2.47 | ✓ | | ✓ | | | |
| 2;05.22 | 2.59 | ✓ | | ✓ | | | |
| 2;06.04 | 2.74 | ✓ | | ✓ | | | |
| 2;06.11 | 2.45 | ✓ | | ✓ | | | |
| 2;06.18 | 2.8 | ✓ | Wh-less | ✓ | ✓ | | |
| 2;07.16 | 2.51 | ✓ | | ✓ | ✓ | | |
| 2;08.06 | 2.66 | ✓ | | ✓ | ✓ | | |
| 2;08.19 | 2.97 | ✓ | | ✓ | ✓ | | |
| 2;09.02 | 2.59 | ✓ | | ✓ | ✓ | | |
| 2;09.07 | 3.15 | ✓ | | ✓ | ✓ | | |
| 2;10.18 | 2.88 | ✓ | | ✓ | ✓ | | |
| 2;11.03 | 2.87 | ✓ | | ✓ | ✓ | | |
| 2;11.27 | 3.64 | ✓ | | ✓ | ✓ | | |
| 3;00.19 | 3.52 | ✓ | | ✓ | ✓ | ✓ | ✓ |
| 3;01.17 | 3.06 | ✓ | | ✓ | ✓ | ✓ | ✓ |
| 3;02.15 | 3.82 | ✓ | | ✓ | ✓ | | |
| 3;03.21 | 3.05 | ✓ | | ✓ | ✓ | ✓ | ✓ |
| 3;04.15 | 3.15 | ✓ | | ✓ | ✓ | ✓ | ✓ |
| 3;05.30 | 2.89 | ✓ | | ✓ | ✓ | ✓ | ✓ |
| 3;07.25 | 3.24 | ✓ | | ✓ | ✓ | | |
| 3;10.07 | 3.71 | ✓ | | ✓ | ✓ | | ✓ |
| 3;11.04 | 4.07 | ✓ | | ✓ | ✓ | | |
| 4;00.11 | 3.81 | ✓ | | ✓ | ✓ | | |
| 4;00.30 | 4.08 | ✓ | | ✓ | ✓ | | ✓ |
| 4;01.11 | 4.66 | ✓ | | ✓ | ✓ | | |
| 4;03.04 | 5.37 | ✓ | | ✓ | ✓ | | ✓ |
| 4;04.28 | 4.28 | ✓ | | ✓ | ✓ | | |
| 4;05.29 | 4.7 | ✓ | | ✓ | ✓ | ✓ | |
| 4;06.12 | 5.06 | ✓ | | ✓ | ✓ | ✓ | ✓ |
| 4;07.25 | 4.62 | ✓ | | ✓ | ✓ | ✓ | ✓ |
| 4;08.03 | 5.03 | ✓ | | ✓ | ✓ | ✓ | ✓ |
| 4;09.13 | 6.07 | ✓ | | ✓ | ✓ | ✓ | ✓ |
| 4;09.29 | 5.2 | ✓ | | ✓ | ✓ | ✓ | ✓ |
| 4;11.15 | 4.01 | ✓ | | ✓ | ✓ | ✓ | ✓ |
| 5;02.13 | 4.92 | ✓ | | ✓ | ✓ | ✓ | ✓ |

**Table 2:** Production of structures by Sarah (Dutch)

- **Results**: CP-structures are produced early.

**Table 3:** CP-structures produced at Stages 1 + 2 and its length

| | V2 | Wh-Q | Y/N-Q | Top/Foc | Illoc | Embed | Length |
|---|---|---|---|---|---|---|---|
| Laura | | 15 | | 4 | 42 | 4 | 1;10.22-3;03.21 (MLUw 1.15-2.54) |
| Gisela | | 1 | | 0 | 6 | 0 | 2;04.25-2;08.00 (MLUw 1.58-2.61) |
| Martina | | 21 | | 4 | 7 | 8 | 1;08.02-2;04.13 (MLUw 1.57-2.69) |
| Rosa | | 133 | | 12 | 3 | 8 | 1;07.13-2;10.14 (MLUw 1.27-2.5) |
| Irene | | 18 | | 3 | 10 | 4 | 1;04.16-1;11.13 (MLUw 1.32-2.95) |
| Koki | | 32 | | 7 | 2 | 4 | 1;07.20-2;04.18 (MLUw 1.96-2.69) |
| Kerstin | ✓ | 16 | 21 | 27 | | 1 | 1;10.03-2;09.11 (MLUw 1.28-2.32) |
| Simone | ✓ | 166 | 3 | 105 | | 24 | 1;10.03-2;06.23 (MLUw 1.54-2.78) |
| Josse | ✓ | 62 | 37 | 68 | | 1 | 2;00.07-2;11.09 (MLUw 1.2-3.57) |
| Sarah | ✓ | 124 | 104 | 116 | | 0 | 1;10.05-3;00.19 (MLUw 1.09-3.52) |

- **Results**: This includes *left-peripherally very high* elements → illocutionary complementisers and topics.

**Table 4:** Emergence of topicalisation *vs* embedding markers

- Simultaneous emergence of embedding markers and **topicalisation** in Friedmann, Belletti, and Rizzi (2021) (their Stage 3) is, in several instances, not replicated.

|         | Topicalisation | Embedding            |
|---------|----------------|----------------------|
| Laura   | 2;08.03        | 3;00.02              |
|         | 1.88 MLUw      | 2.42 MLUw            |
| Gisela  | 2;08.00        | 2;08.00 (**same file**) |
|         | 2.61 MLUw      | 2.61 MLUw            |
| Martina | 1;08.17        | 1;11.20              |
|         | 1.56 MLUw      | 1.99 MLUw            |
| Rosa    | 2;04.29        | 2;06.29              |
|         | 1.77 MLUw      | 2.6 MLUw             |
| Irene   | 1;08.09b       | 1;09.10              |
|         | 2.24 MLUw      | 3.28 MLUw            |
| Koki    | 1;11.25        | 1;11.25 (**same file**) |
|         | 2.47 MLUw      | 2.47 MLUw            |
| Kerstin | 2;00.05        | 2;07.23              |
|         | 1.76 MLUw      | 2.13 MLUw            |
| Simone  | 1;10.20        | 2;04.20              |
|         | 1.62 MLUw      | 1.96 MLUw            |
| Josse   | 2;03.28        | 2;09.02              |
|         | 1.94 MLUw      | 2.42 MLUw            |
| Sarah   | 2;00.17        | 3;00.19              |
|         | 1.68 MLUw      | 3.52 MLUw            |
| **Average** | 1.93 MLUw  | 2.54 MLUw            |

## Case study 1: the acquisition of the (cartographic) CP

- **Illocutionary complementisers** also emerge from the earliest files for many children (Bosch, 2023b).

    (3)  a. Ai, **que** crema!
         ouch that.EXCL burn.3SG
         'Ouch, it's burning!' (Laura, MLUw 1.35)

        b. **Que** cau!
           that.EXCL fall.3SG
           'It's falling!' (Laura, MLUw 1.3)

- → **Broader generalisation**, attested across a wider sample of 10 Catalan and Spanish children - Bosch (2023b).

! **However**: CP-structures *early*, but Split CP structures systematically *late*.

**Table 5:** Emergence of CP- *vs* Split CP-structures

|  | CP-structures | Split CP-structures |
|---|---|---|
| Laura | 1;10.22 | 3;03.21 |
|  | 1.15 MLUw | 2.54 MLUw |
| Gisela | 2;04.25 | 2;08.00 |
|  | 1.58 MLUw | 2.61 MLUw |
| Martina | 1;08.02 | 2;04.13 |
|  | 1.57 MLUw | 2.69 MLUw |
| Rosa | 1;07.13 | 2;10.14 |
|  | 1.27 MLUw | 2.5 MLUw |
| Irene | 1;04.16 | 1;11.13 |
|  | 1.32 MLUw | 2.95 MLUw |
| Koki | 1;07.20 | 2;04.18 |
|  | 1.96 MLUw | 2.69 MLUw |
| Kerstin | 1;10.03 | 2;09.11 |
|  | 1.28 MLUw | 2.32 MLUw |
| Simone | 1;09.11 | 2;06.23 |
|  | 1.54 MLUw | 2.78 MLUw |
| Josse | 2;00.07 | 2;11.09 |
|  | 1.2 MLUw | 3.57 MLUw |
| Sarah | 1;10.05 | 3;00.19 |
|  | 1.09 MLUw | 3.52 MLUw |

## Case study 1: the acquisition of the (cartographic) CP

! **However**: Emergence is not just late, but ***sudden and 'explosive'*** in the production data ($z$ = 2.949874, $p$ = 0.003).

**Table 6:** Production of Split CP-structures before and after MLUw $\sim$ 2.5

|  | **Before MLUw $\sim$ 2.5** | **After MLUw $\sim$ 2.5** | % |
|---|---|---|---|
| Laura | 1 | 20 | 4.8-95.2% |
| Gisela | 0 | 9 | 0-100% |
| Martina | 0 | 5 | 0-100% |
| Rosa | 1 | 31 | 3.1-96.9% |
| Irene | 0 | 85 | 0-100% |
| Koki | 0 | 41 | 0-100 % |
| Kerstin | 3 | 4 | 42.9-57.1% |
| Simone | 2 | 7 | 22.2-77.8% |
| Josse | 1 | 19 | 5-95% |
| Sarah | 2 | 51 | 3.8-96.2% |
| **Total** | 10 | 272 | 3.5-96.5% |

! **However**: Emergence is not just late, but ***sudden and 'explosive'*** in the production data ($z = 2.949874$, $p = 0.003$).
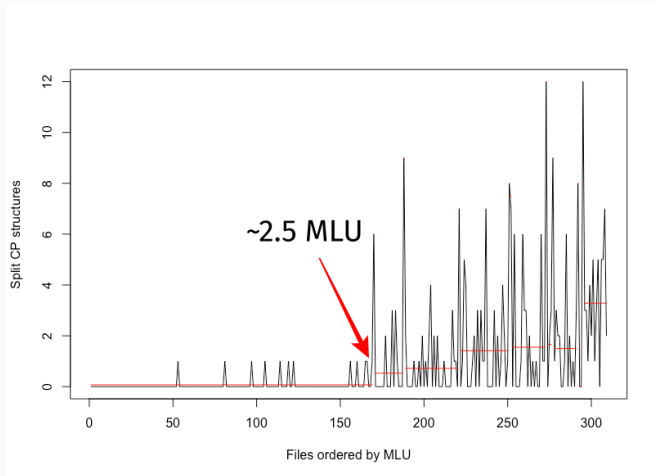
→ Production data tells us that children harness cartographic-type knowledge significantly late and abruptly.

→ **Our preliminary interpretation: cartography is 'learned', not innate.**

**Generalisation 3: Cartography is Emergent**

Evidence for cartographic-type structure within CP systematically and abruptly emerges at a later developmental stage, elaborating on developmentally-prior structure (a 'basic' CP).

$\boxed{\text{Summary}}$

$\rightarrow$ Early CP-structures, including structurally very high ones.

! BUT, no evidence to assume articulated CP structure until a much later stage.

**Summary**

→ Early CP-structures, including structurally very high ones.

! BUT, no evidence to assume articulated CP structure until a much later stage.

**Upshot**

! ✗ Contradicts bottom-up maturation; ✓ supports continuity, inward maturation and neo-emergentism.

! Development *cannot* be recapitulating a cartographic spine → 'coarse' to 'fine' development in production.

? How do we address Generalisations 1-3 in a 'fixed granularity' approach?

# Case study 1: the acquisition of the (cartographic) CP

**Summary**

→ Early CP-structures, including structurally very high ones.

! BUT, no evidence to assume articulated CP structure until a much later stage.

**Upshot**

! ✗ Contradicts bottom-up maturation; ✓ supports continuity, inward maturation and neo-emergentism.

! Development *cannot* be recapitulating a cartographic spine → 'coarse' to 'fine' development in production.

? How do we address Generalisations 1-3 in a 'fixed granularity' approach?

↪ **CAD gives a plausible, independently-proposed explanation for the data.**

- **Case study 2**: acquisition of **topicalisation crosslinguistically**.
    - → Corpus data on **7 Germanic-Romance bilinguals**, learning Italian-Dutch, German-Spanish or German-Italian.
    - → **Monolingual data** from **10+** typologically diverse **languages**.

**Rationale**: zooming in on theoretical significance of *developmental variation*.

→ **Our data now** : systematic corners of *developmental variation* in the acquisition of **topicalisation** crosslinguistically.

→ **Needed**: a theory explicitly predicting developmental universals *and* variation observed.

**Rationale**: zooming in on theoretical significance of *developmental variation*.

→ Our data now : systematic corners of *developmental variation* in the acquisition of **topicalisation** crosslinguistically.

→ **Needed**: a theory explicitly predicting developmental universals *and* variation observed.

↪ **CAD** makes correct predictions for the crosslinguistic acquisition of *parametric distinctions* in this domain.

- **Corpus study on Germanic-Romance bilinguals** → early CP-structures. BUT, 'late' topics not a universal, L1-dependent pathways. Germanic topics have a clear advantage.

**Table 7:** Emergence of all CP-structures for the seven children

|  | V2 | Wh-Q | Y/N-Q | Top/Foc | CLLD | Illoc | Embed |
|---|---|---|---|---|---|---|---|
| HEL Italian |  | 1;09.28 |  | 2;05.00 | 2;07.08 | 2;11.03 | 2;05.00 |
| HEL Dutch | 1;09.11 | 1;09.11 | 1;09.11 | 1;11.00 |  |  | 2;02.18 |
| SIM Spanish |  | 2;05.24 |  | 2;08.06 | 3;03.12 | 2;05.24 | 3;00.10 |
| SIM German | 2;02.11 | 2;03.11 | 2;03.25 | 2;03.11 |  |  | 3;01.03 |
| AUR Italian |  | 2;04.10 |  | 2;04.10 | 2;04.10 | 2;01.23 | 2;06.04 |
| AUR German | 2;10.11 | 3;05.16 | 2;10.10 | 2;10.10 |  |  | 2;11.18 |
| CAR Italian |  | 1;08.28 |  | 2;06.09 | 2;06.09 | 2;02.04 | 2;06.29 |
| CAR German | 1;10.08 | 1;10.08 | 1;10.08 | 1;11.12 |  |  | 2;08.21 |
| LUC Italian |  | 2;04.16 |  | 2;03.24 | 2;10.10 | 3;00.05 | 2;06.01 |
| LUC German | 2;01.18 | 2;05.16 | 2;05.15 | 2;02.22 |  |  | 2;06.13 |
| LUK Italian |  | 2;03.06 |  | 2;05.06 | 2;06.18 | 2;07.15 | 2;07.15 |
| LUK German | 2;03.06 | 2;03.06 | 2;03.06 | 2;04.23 |  |  | 2;05.06 |
| MAR Italian |  | 2;00.16 |  | 2;00.16 | 3;05.11 | 2;05.26 | 2;04.27 |
| MAR German | 2;00.16 | 1;11.21 | 2;04.16 | 2;04.16 |  |  | 3;01.27 |

- Why? We posit a **novel correlation** with **parametric complexity**, esp. **[A/A'] and operator/non-operator** properties (i.a., Koster, 1978; Cinque, 1999; Urk, 2015).

- **Germanic**: generalized, pure A', **operator** V-to-C; few (no?) formal distinctions in its left periphery → **acquired early**.

- **Romance**: mixed A/A' properties, **non-operator** → requires **higher description length**, an additional featural distinction between kinds of [A'] (see also Bhatt and Keine, 2023; Chierchia, to appear) → **acquired late**.

↪ **Does this generalize crosslinguistically? ... Yes!**

**Table 8:** A'- vs. A-movement (Urk, 2015, p. 23)

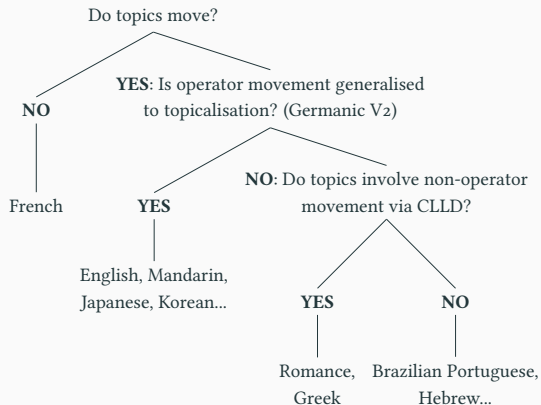| A-properties | Ā-properties |
|---|---|
| Local, restricted to nominals | Long-distance, not restricted to nominals |
| No reconstruction for Condition C | Reconstruction for Condition C |
| No Weak Cross-over, new antecedents for anaphors | Weak Cross-over, no new antecedents for anaphors |
| No parasitic gap licensing | Parasitic gap licensing |

- Why? I propose topics that require *parametrically* finer-grained distinctions acquired later → **borne out crosslinguistically** (see Bosch and Biberauer, 2024, for full details).

**Table 9:** Topicalisation strategies, their acquisition and their formal complexity

| Language | Acquisition | Formal characteristics of topicalisation | Parametric complexity |
|---|---|---|---|
| French | Very early | Adjoined or base-generated | Macroparametric |
| Germanic V2 | Very early | Generalised V2 diacritic | Mesoparametric |
| Mandarin Japanese Korean | (Possibly) early | Operator movement or base-generation | Mesoparameter |
| European Portuguese (non-CLLD) | Early | Operator movement | Mesoparametric |
| Spanish Italian Catalan | Late | Non-operator movement with CLLD | Microparameteric |
| Greek | Late | Non-operator movement with CLLD | Microparameter |
| Hebrew Brazilian Portuguese | Late | Non-operator movement without CLLD | Microparametric |

(4)   Parametric complexity in topicalisation structures

Do topics move?

NO

**YES**: Is operator movement generalised
to topicalisation? (Germanic V2)

French

**YES**

**NO**: Do topics involve non-operator
movement via CLLD?

English, Mandarin,
Japanese, Korean...

**YES**          **NO**

Romance,   Brazilian Portuguese,
Greek          Hebrew...

→ **Acquisition timings follow from the parametric complexity
('granularity') of each topicalisation strategy**

(5)

```
                    [A']
                   /  |  \
              [Op]  [Top]  ...
             / | \
        [wh] [Rel] [Foc]
```
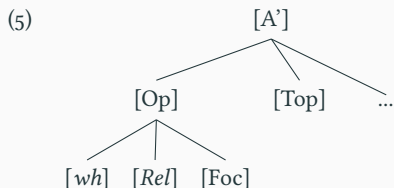
(Aravind, 2017, p. 335)

$\rightarrow$ **Acquisition timings follow from the parametric complexity ('granularity') of each topicalisation strategy**

- Data corroborates earlier generalizations (i) **Early Acquisition of CP**, (ii) **Structural Height and Acquisition Mismatch** (Bosch, 2023a; Bosch and Biberauer, 2024a).

- *Plus* brings forth a novel one...

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**L1-dependent Topic Development**

Topics are not acquired universally late crosslinguistically. The timing of acquisition of topics systematically correlates with the *formal, parametric complexity* of the topicalisation strategies in each L1: formally, featurally simpler topics (adjoined, operator, etc.) are acquired earlier than more complex topics (e.g., non-operator).

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**Upshot**

↪ Topics often assumed to mature *universally* 'late' (i.a., Radford, 1990; Rizzi, 1993; Friedmann, Belletti, and Rizzi, 2021; Meira and Grolla, 2023).

! **However, investigating the granularity and complexity of late topics reported for various L1s tells us this *isn't a universal*.**

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! **However, investigating the granularity and complexity of late topics reported for various L1s tells us this *isn't a universal*.**

↪ Two highly consequential results:

! Early CP-structures (topics, i.a.) observed, again.

! 'Late' topics in maturational work ==*epiphenomena*== of L1s studied, *not* result of universal maturational constraints on CP.

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! 'Late' topics in maturational work *epiphenomena* of L1s studied, *not* result of universal maturational constraints on CP.

↪ **Characterisable in terms of differentiation of A'-features.**

# Implications and outlook

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- Two potential weaknesses of theoretical approaches to L1 categorisation: (i) **fixed granularity** commitment, (ii) (almost exclusive) emphasis on **universals**.

$\rightarrow$ Dropping these commitments leads to a range of productive results.

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- Two potential weaknesses of theoretical approaches to L1 categorisation: (i) **fixed granularity** commitment, (ii) (almost exclusive) emphasis on **universals**.

→ Dropping these commitments leads to a range of productive results.

→ We outlined a strong **working hypothesis (CAD)**, synthesising previous work. Two syntactic case studies to endorse it:

  - **Case study 1**: granularity-aware data analysis tells us cartographic structure may be late-acquired.
  - **Case study 2**: granularity-aware data analysis makes a fresh cut among data on the acquisition of topics crosslinguistically.

↪ Some implications:

  - Novel ways of approaching developmental data.
  - Significant ramifications for categorisation in L1 acquisition and its ontological bases.
  - Crosslinguistic typology of (left peripheral) categories.
  - Implications for diachrony (see relevant work in Cournane and Klævik-Pettersen, 2023).

# Thank you!

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