Not all topics are equal
Syntactic complexity and its effect on the acquisition of left-peripheral structures*

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Syntax Square (MIT), 5 November 2024

1 Introduction: acquiring the left periphery

Three independent questions regarding the acquisition of the left periphery, and functional categories more broadly:

(1) How, and in which order, are functional categories acquired?

(2) Are there crosslinguistically *universal* developmental stages? Which stages are *language-variant*, and what conditions this variation?

(3) What is the contribution of UG in (1-2)? How much of acquisition is *biologised*?

- Functional categories? Formal features?
- ...*And* universal developmental pathways (viz. maturation below)?

Traditional split in theories of functional category acquisition.

- **Continuity**: re (1), functional categories are available from the start. Re (2), universally, early evidence for functional structure. Syntactic categories are provided by UG (3).
- **Maturation**: re (1), *gradual*, (typically) bottom-up development of functional categories, e.g., universally *late* CP. Re (2), order of acquisition of functional categories is universal (e.g., VP → TP → CP). This (bottom-up) developmental pathway, and the associated categories, are *hard-wired* by UG (3).

↪ Emphasis on theorising **developmental universals** → (parts of) learning paths are crosslinguistically universal (empirical generalisations), because UG specifies so (theoretical explanation).

? ... And **developmental variation**?

→ **Emerging tension**: we need a comprehensive, crosslinguistically applicable model of syntactic development that is *constrained* enough to account for crosslinguistically universal orders of acquisition, but *flexible* and *explicit* enough to *predict* any language-specific variation therein.

*Thank you to Cécile de Cat and Bert Vaux for discussion on an earlier version of this work; to Natascha Müller in particular for giving me access to her bilingual German-Italian corpus; to attendees of NELS 55; to Aayush Bagchi, James Morley and SyntaxLab and CamPAL audiences for comments; to Adam Ledgeway, Ana Maria Martins and Jairo Nunes for useful pointers; and to Clara Martins Castro for Brazilian Portuguese judgements. This work is generously supported by an Open-Oxford-Cambridge AHRC DTP – St John's Studentship (UKRI and St John's College).

1.1 Today

Our contributions Zooming in on ***developmental universals*** and ***developmental variation*** by studying (i) 'earliness' of CP elements, (ii) crosslinguistic variation in topic acquisition.

↪ Brings novel insights on the *biologisation issue* above, and on the empirical consequences of assuming very rigid, crosslinguistically 'fixed' developmental pathways.

The puzzle and our proposal

(1) Systematic **evidence for early CP** in the data.
(2) Crosslinguistically ***flexible***, **L1-specific** timings of acquisition of **topics** (early/late).
Unclear: How do we predict (1-2) with the above (universals-centred) toolkit?

→ **New proposed generalisation**: **formal complexity** of topics (A/A', operator/non-operator), *not* syntactic maturation, conditions their emergence.

! 'Late' topics in maturational work merely a *language-specific effect*.

→ A **neo-emergentist** perspective on acquisition **predicts** this developmental variation (Biberauer & Roberts, 2015; Biberauer, 2019).

2 Acquiring the left periphery: theoretical approaches

2.1 Maturation

Delayed acquisition of functional categories. Proposal: operationalise this delay in terms of **syntactic maturation** → biological endowment dictates a universal functional spine, *and* its order of development.

Two instantiations of this approach: *bottom-up* and *inward* maturation.

- **Bottom-up maturation**: (arguably) dominant approach so far. Top of the tree (≈ **CP**) acquired **last** (Radford, 1990; Rizzi, 1993; Friedmann et al., 2021).

→ Recent, left periphery-centred proposal: **Growing Trees Hypothesis**, two-stage development of LP, supported by Hebrew and Brazilian Portuguese data (Friedmann et al., 2021; Meira & Grolla, 2023).

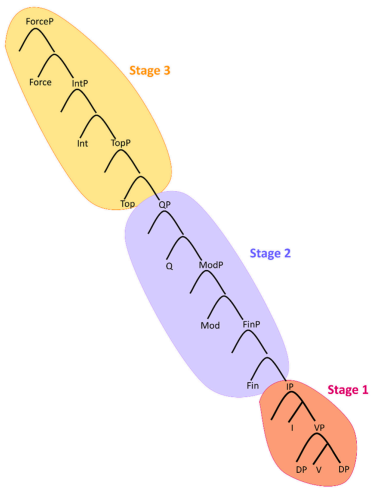


Figure 1: Stages in the Growing Trees Hypothesis (Friedmann et al., 2021: p. 12)

- **Inward maturation**: CP emerges early.
  - Galasso (2003)'s 'Empty Middle' approach: CP>Ø>VP to CP>IP>VP.
  - Heim & Wiltschko (2021)'s **Inward Growing Spine Hypothesis**: interactional and universal spine matures inwardly (Figure 2).

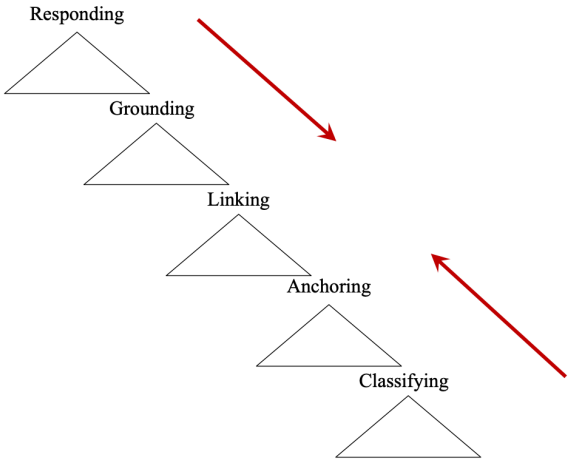


Figure 2: Inward Growing Spine Hypothesis (from Wiltschko, 2023, BCGL 16 invited talk)

- Another, overlapping approach – Tsimpli (2005): maturation in terms of **interpretable** vs **uninterpretable** features, the latter (e.g., uninterpretable tense and discourse $[F]$s) being maturationally delayed.

Overall: theoretical emphasis on **universality**: hard-coded universal acquisition orderings.

2.2 Continuity

Children's initial state $\simeq$ adult's functional inventory. The extent to which this overlap is an isomorphism varies:

- Strong Continuity (i.a., Poeppel & Wexler, 1993; Boser et al., 1992; Hyams, 1992)
- Weak Continuity (Underspecification of features, Lexical Learning, etc.) (i.a., Hyams, 1996; Clahsen et al., 1994).
- Westergaard (2009)'s micro-cues approach: sensitivity to cartographic structures early on.

Overall: theoretical emphasis on **universality** (again): functional structure universally available from the start[1].

2.3 Interim summary: on the need for a theory of (language-specific) developmental variation

- **Analytical focus** of maturational and continuity approaches: **developmental universals**.
- Predicting **crosslinguistic variation** in acquisition orderings?
  - No explicit proposals for possible 'corners' of variation in Friedmann et al. (2021) and precedents.
  - Underspecification of features (e.g., Hyams, 1996; Schütze, 2010): which features are more/less likely to be underspecified?
  - Lexical Learning (Clahsen et al., 1994, 1996): which structures/lexical items have to be learned before we can consider CP acquired?

[1] Possible underspecification of features notwithstanding.

  - Continuity: complex task remains acquiring an L1-specific grammar (Lust, 1999, 2012), how does the child do it?

→ **Two-factors-centred approaches** (UG and input): No explicit theory about which general cognitive strategies the child harnesses in the task of learning an L1-specific and UG-guided grammar.

→ **Maturational and continuity approaches leave room for some variation, but *do not theorise it*.**

- **Our data today**: systematic corners of developmental variation in the acquisition of topicalisation crosslinguistically.
- **Needed**: a theory that explicitly predicts both developmental universals and variation observed.

→ We argue for the explanatory potential of **neo-emergentism** in this domain (§4-5).

3 Two corpus studies on Germanic-Romance bilinguals

3.1 Methodology

Study with **seven bilingual children**. **Two** of them reported here:

- **Heleen, Italian/Dutch** (Amsterdam corpus); **Simon, Spanish/German** (PhonBLA corpus).
- Both *strongly balanced* (per criteria in Hager & Müller, 2015).

Table 1: Children studied and summary information (Hulk, 1997; Lleó et al., 2003; Müller et al., 2006)

Corpus	Child	Language	Files analysed	Age range	MLUw range	Total utterances
Amsterdam	HEL	Italian	23	1;09-4;06	1.63-5.38	4914
		Dutch	29	1;09-4;06	1.67-5.59	6696
PhonBLA	SIM	Spanish	42	1;02-5;10	1.0-5.0	3533
		German	39	1;01-5;10	1.0-4.26	4033
Müller et al.	AUR	Italian	42	1;09-3;05	1.13-4.34	5015
		German	42	1;09-4;00	1.03-4.39	4628
	CAR	Italian	38	1;08-3;07	1.13-4.6	5544
		German	28	1;08-3;01	1.0-4.4	3795
	LUC	Italian	52	1;06-4;00	1.0-3.83	3793
		German	52	1;06-4;00	1.0-4.30	8077
	LUK	Italian	29	1;07-3;03	1.0-4.4	4358
		German	26	1;07-3;01	1.0-4.2	5193
	MAR	Italian	53	1;06-4;00	1.15-4.68	7781
		German	40	1;06-3;05	1.0-4.09	4012

Study 1 Left-peripheral structures quantified

V-to-C (Germanic only) • Wh-Qs • Y/N-Qs (Germanic) • Top/Foc • Illocutionary complementisers (Romance) • Finite embedding

↪ When is CP knowledge apparent in the data? Is there L1-variation or universality in the acquisition of some CP-structures?

Study 2 analysis of production of clitics relative to CLLD; this included object clitics and also clitics mandated by reflexive or impersonal verbs.

↪ To probe the extent to which the timing of emergence of topicalisation, notably CLLD, in Romance is closely linked with the emergence of cliticisation: emergence of CLLD directly tied to acquisition of cliticisation, or partly independent developments?

3.2 Results

We describe first the results of their Romance languages, and then their Germanic languages, before contrasting them at the end.

3.2.1 Study 1: left-peripheral structures

Romance

Production of CP-structures across Heleen and Simon's Romance languages is summarised below.

Table 2: Production of CP-structures in Heleen's Italian

Age	MLU	Wh-Q	Top/Foc	Illoc	Embed
1;09.09	1.68				
1;09.28	1.63	✓			
2;00.01	1.92	✓			
2;00.23	1.9				
2;01.21	2.06	✓			
2;02.17	2.9	✓			
2;04.14	2.9	✓	✓		
2;05.00	3.2	✓	✓		✓
2;05.07	2.23	✓			
2;07.08	3.41	✓	✓		✓
2;09.15	2.1	✓			✓
2;11.03	4.01		✓	✓	✓
3;01.00	3.11	✓			✓
3;01.15	3.79	✓	✓		
3;02.10	3.25	✓	✓		✓
3;03.08	2.94	✓	✓		✓
3;03.29	4.24	✓	✓		✓
3;06.02	5.38		✓	✓	✓
4;00.27	3.34	✓	✓	✓	✓
4;01.25	3.48	✓	✓		✓
4;04.00	3.02	✓	✓	✓	✓
4;05.01	4.69	✓	✓	✓	✓
4;06.00	4.5	✓	✓	✓	✓

Table 3: Production of CP-structures in Simon's Spanish (shortened)

Age	MLU	Wh-Q	Top/Foc	Illoc	Embed
1;08.08	1.04				
1;08.22	1.06				
1;09.09	1.68				
1;09.28	1.63				
1;10.17	1.13				
1;10.22	1.4				
1;11.09	1.08	✓			
1;11.26	1.22				
2;00.10	1.27				
2;03.04	1.83				
2;03.17	1.85				
2;04.01	2.03				
2;05.24	2.95			✓	
2;05.26	2.17	✓		✓	
2;06.09	2.45	✓			
2;06.23	1.95	✓		✓	
2;07.09	2.29				
2;07.23	2.05				
2:08.06	2.41		✓		
2;08.20	2.84	✓	✓	✓	
2;10.02	2.48	✓	✓		
3;00.10	2.62			✓	
3;00.24	3.18	✓			✓
3;01.24	2.78	✓	✓	✓	✓
3;03.12	3.53	✓	✓		✓
3;04.16	3.55	✓		✓	✓
3;05.25	3.33	✓	✓		✓
4;01.03	5.0				✓
4;03.04	2.0				
4;08.14	3.0				

Unpacking these results, qualitatively and quantitatively:

☞ **Very early structures**: wh-questions and illocutionary complementisers.

- First structures produced: **wh-questions**, used frequently and with various wh-words/verbs from 1;09 in Heleen and around 2;05 for Simon.

(4) a. Italian, Heleen (1;09.28, MLUw 1.63)

Ecco Maria cosa hai fatto?
here Maria what AUX.HAVE.2SG do.PTCP

'Here (you have it), Maria, what have you done?'

b. Heleen (2;01.21, MLUw 2.06)

Dov' è l'attro?
where be.3SG the-other

'Where's the other one?'

c. Heleen (2;02.17, MLUw 2.9)

Come si chiama tuo gatto?
how CL.REFL= be.called.3SG your cat

'What your cat's name?'

(5) a. Simon (2;05.26, MLUw 2.17)

Qué es esto?
what be.3SG this

'What is this?'

b. Simon (2;05.26, MLUw 2.17)

Qué hay aquí?
what there.be.3SG here

'What's here'

c. Simon (2;05.26, MLUw 2.17)

Dónde está mi locomotora?
where be.3SG my train

'Where's my train?'

- At this same point (2;05), we also observe emergence of **illocutionary complementisers** in Simon → aligns with (preliminary) generalisation in Bosch (2023b).

(6) a. Spanish, Simon (2;05.24, MLUw 2.95)

Que llueve
that.EXCL rain.3SG

'It's raining!'

b. Simon (2;05.24, MLUw 2.95)

Que sube, sube, sube
that.EXCL go.up.3SG go.up.3SG go.up.3SG

'It's going up, up and up!'

c. Simon (2;05.26, MLUw 2.17)

Que se ha acabado, era de noche
that.CONJ CL.REFL= AUX.HAVE.3SG finish.PTCP be.PST.3SG of night

'It has finished, it was late at night.'

👉 Late topics

- **Ambiguous** left-dislocations, possibly **focalisations**, start emerging for Simon before clear topics (Heleen produces topics/foci later).

(7) a. Spanish, Simon (2;08.06, MLUw 2.41)

Y este pinta tú.
and this paint.IMP you

'This one, paint it.'

b. Simon (2;08.06, MLUw 2.41)

Este 0he pintado rosa.
this AUX.HAVE.1SG paint.PTCP pink

'This one, I (have) painted it pink.'

c. Simon (2;08.20, MLUw 2.84)

De navidad quiero.
of Christmas want.1SG

'I want some OF CHRISTMAS.'

- **Unambiguous topics**, in the form of **CLLD**, emerge systematically **late**: 2;07 for Heleen and 3;03 for Simon.

(8) a. Italian, Heleen (2;07.08, MLUw 3.41)

A me mi piace questo qua.
to me CL.IO= like.3SG this here

'I like this one here.'

b. Heleen (2;11.03, MLUw 4.01)

Questo lo devi portare.
this CL.DO= must.2SG bring.INF

'This one, you have to bring it.'

c. Spanish, Simon (3;03.12, MLUw 3.53)

Eso no lo sé.
this not CL.DO= know.1SG

'This one, I don't know it.'

- CLLD appears to be genuinely late in this data: it appear *after* other 'yardsticks' for late phenomena in both children, notably finite embedding markers, and also co-occurring topics and wh-elements (see Bosch, 2023a).
- Finite embedding markers appear at 2;05 for Heleen's Italian and 3;00 for Simon's Spanish.

Table 4: Emergence of CP-structures in their Romance languages and all quantitative data obtained

	Wh-Q	**Top/Foc**	**CLLD**	**Illoc**	**Embed**	
Heleen	1;09.28	2;05.00	2;07.08	2;11.03	2;05.00	**Emergence**
Simon	2;05.24	2:08.06	3;03.12	2;05.24	3;00.10	
Heleen	102 (55)	37	11	8	133	**Quantitative data**
Simon	30 (18)	10	3	19	14	

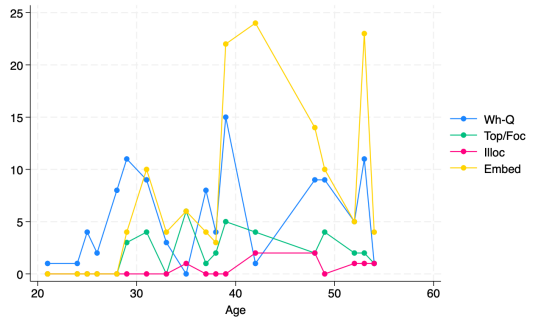


Figure 3: Development of CP-structures in Heleen's Italian

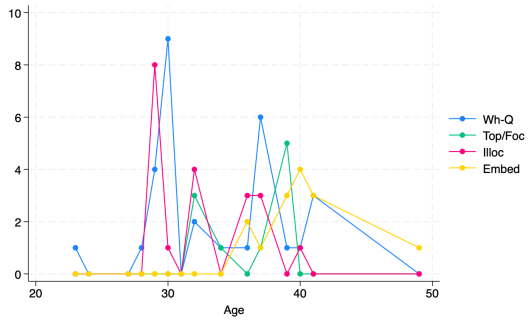


Figure 4: Development of CP-structures in Simon's Spanish

German

Table 5: Production of CP-structures in Heleen's Dutch

Age	MLU	V2	Wh	Y/N	Topic	Embed
1;09.11	1.66	✓	✓	✓		
1;10.07	1.75	✓	✓	✓		
1;11.00	1.99	✓	✓	✓	✓	
2;00.21	1.67	✓	✓	✓	✓	
2;01.20	1.83	✓	✓	✓	✓	
2;02.18	2.46	✓	✓	✓	✓	✓
2;03.23	2.63	✓	✓	✓	✓	✓
2;05.10	2.76	✓	✓	✓	✓	✓
2;06.07	2.58	✓	✓	✓	✓	✓
2;07.09	4.03	✓	✓	✓	✓	✓
2;08.20	3.39	✓	✓	✓	✓	✓
2;10.06	3.62	✓	✓	✓	✓	✓
2;11.04	4.04	✓	✓	✓	✓	✓
3;00.21	3.43	✓	✓	✓	✓	✓
3;01.14	3.45	✓	✓	✓	✓	
3;02.09	4.09	✓	✓	✓	✓	✓
3;02.29	2.62	✓	✓	✓	✓	
3;03.28	3.82	✓	✓	✓	✓	✓
3;05.02	4.49	✓	✓	✓	✓	✓
3;06.05	4.83	✓	✓	✓	✓	✓
3;07.02	4.33	✓	✓	✓	✓	✓
3;09.01	3.61	✓	✓	✓	✓	✓
3;09.22	4.67	✓	✓	✓	✓	✓
4;00.27	3.93	✓	✓	✓	✓	✓
4;01.25	3.9	✓	✓	✓	✓	✓
4;04.00	3.55	✓	✓	✓	✓	✓
4;05.02	4.72	✓	✓	✓	✓	✓
4;06.00	4.12	✓	✓	✓	✓	✓
4;06.01	5.59	✓	✓	✓	✓	✓

Table 6: Production of CP-structures in Simon's German (shortened)

Age	MLU	V2	Wh	Y/N	Topic	Embed
2;01.03	1.46					
2;02.11	1.43					
2;02.25	1.82					
2;03.11	2.02	✓	✓		✓	
2;03.25	2;29	✓		✓		
2;04.22	-					
2;06.04	2.01	✓			✓	
2;07.01	3.18	✓	✓	✓	✓	✓
2;08.15	2.26	✓		✓	✓	
2;09.17	2.82	✓	✓	✓	✓	
2;09.28	3.05	✓	✓	✓	✓	
2;11.18	2.0					
3;00.04	3.56	✓	✓	✓	✓	
3;00.18	3.26	✓	✓	✓	✓	
3;01.03	3.52	✓	✓	✓	✓	✓
3;02.01	3.09	✓	✓	✓	✓	✓
3;05.07	4.12	✓	✓	✓	✓	✓
3;06.25	3.79	✓	✓	✓	✓	✓
3;10.04	-					
4;01.16	4.26	✓	✓	✓	✓	✓
4;09.25	4.05	✓	✓	✓	✓	✓
5;03.17	3.69	✓	✓	✓	✓	✓
5;10.01	4.08	✓	✓	✓	✓	✓

Unpacking the results again:

☞ **Early emergence of almost all CP structures**

- Knowledge of the **V2 system** in Germanic: distributional distinction between finite *vs* non-finite verbs (1;09, Heleen; 2;02, Simon).

(9) a. Dutch, Heleen (1;09.11, MLUw 1.66)

Tomaat geven, papa mij.
tomato give.INF dad me

'Tomato give dad me.'

b. Heleen (1;09.11, MLUw 1.66)

Ik wil deze hebbe, pakken.
I want.1SG this have.INF grab.INF

'I want to have this one, to grab it.'

c. Heleen (1;10.07, MLUw 1.75)

En Heleen heeft blote voeten.
and Heleen have.3SG bare feet

'And Heleen has bare feet.'

d. Heleen (1;10.07, MLUw 1.75)

Kom eens met [?] Heleen.
come.IMP once with Heleen

'Come here with Heleen.'

(10) a. German, Simon (2;03.11, MLUw 2.02)

Karussell fahren.
carrousel drive.INF

'Ride (a) carrousel.'

b. Simon (2;03.11, MLUw 2.02)

Kommt da Dampflokomotive.
come.3SG there steam.train

'There comes the steam train.'

c. Simon (2;03.11, MLUw 2.02)

Ja, weiß ich.
yes know.1SG I

'Yes, I know (that).'

d. Simon (2;03.11, MLUw 2.02)

Ich komme gleich wieder.
I come.3SG right again

'I will be right back.'

- Almost simultaneously with V2: the **entire range of CP-structures emerges**, bar subordination. **Wh-questions**, **yes/no questions** and **topics**.

(11) a. Dutch, Heleen (1;09.11, MLUw 1.66)

Hoe bedoel je?
how mean.2SG you

'What do you mean?'

b. Heleen (1;10.07, MLUw 1.75)

Wil Lalla ook latte@s?
want.3SG Lalla also lattes

'Does Lalla also want lattes?'

c. Heleen (1;11.00, MLUw 1.99)

Lamp wille niet pakken.
lamp want.1SG not grab.INF

'The lamp, (I) don't want to grab it.'

d. Heleen (2;01.20, MLUw 1.83)

Dan zegt [: zeg] ik au!
then say.3SG say.1SG I au

'Then I say au!'

(12) a. German, Simon (2;03.11, MLUw 2.02)

Wie heißt das Schiff ?
how be.called.3SG the boat

'How is the boat called?'

b. Simon (2;03.25, MLUw 2.29)

Geht das?
go.3SG it

'Does it work?'

c. Simon (2;03.11, MLUw 2.63)

Da fahren Autos.
then drive.3PL cars

'There cars drive.'

d. Simon (2;03.11, MLUw 2.63)

Und da ist Alexander.
and there be.3SG Alexander

'And there is Alexander.'

Table 7: Emergence of CP-structures in their Germanic languages and quantitative data obtained

	V2	Wh-Q	Y/N-Q	Top/Foc	Embed	
Heleen	1;09.11	1;09.11	1;09.11	1;11.00	2;02.18	**Emergence**
Simon	2;02.11	2;03.11	2;03.25	2;03.11	3;01.03	
Heleen	✓	176 (91)	147	574	103	**Quantitative data**
Simon	✓	59 (35)	66	306	37	

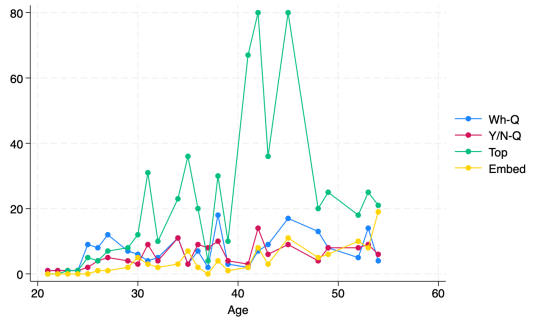


Figure 5: Development of CP-structures in Heleen's Dutch

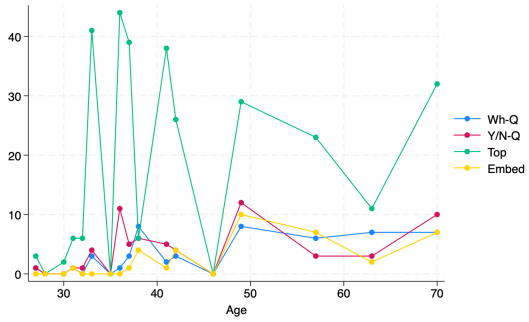


Figure 6: Development of CP-structures in Simon's German

Overall:

- **CP** is **acquired early** in some form, with **shared** but also **crosslinguistically varied patterns**.
- The emergence of CP-structures furthermore **does not appear to depend on structural height** in a cartographic left periphery (cf. Friedmann et al., 2021) → viz. topics, illocutionary complementisers, and Germanic structures like Y/N-Qs (see, i.a., Rizzi, 1997; Corr, 2016: for data and cartographic analyses).
- Crosslinguistic orders of acquisition of left-peripheral structures are **more flexible** than often acknowledged.

Early CP development is particularly apparent in their Germanic languages, but is also visible in Romance via wh-questions, especially, and also illocutionary complementisers.

Table 8: 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

A further condensed break-down of Table 8 summarising the stages and acquisition orderings observed is given in Table 9:

Table 9: Relative order of emergence of diagnostics studied

Child	Order of emergence
HEL Italian	Wh-Q > Top/Foc, Embed > CLLD > Illoc
HEL Dutch	V2, Wh-Q, YN-Q > Top > Embed
SIM Spanish	Wh-Q > Illoc > Top/Foc > Embed > CLLD
SIM German	V2 > Wh-Q, YN-Q, Top > Embed
AUR Italian	Illoc > Wh-Q, Top/Foc, CLLD > Embed
AUR German	V2, YN-Q, Top > Wh-Q > Embed
CAR Italian	Wh-Q > Illoc > Top/Foc, CLLD > Embed
CAR German	V2, Wh-Q, YN-Q > Top > Embed
LUC Italian	Wh-Q > Top/Foc, Embed > CLLD > Illoc
LUC German	V2, Wh-Q, YN-Q > Top > Embed
LUK Italian	Top/Foc > Wh-Q > CLLD > Embed > Illoc
LUK German	V2 > Top > Wh-Q, YN-Q > Embed
MAR Italian	Top/Foc > Wh-Q > Embed > Illoc > CLLD
MAR German	V2, Wh-Q, YN-Q > Top > Embed

3.2.2 Study 2: the development of clitics

Apparent 'discrepancy' in acquisition of topics in Germanic *vs* Romance: does this represent an inherent difficulty with *Romance* topics? Study 2 asks: **is the development of clitics reponsible for this delay?**

→ **No, at least not entirely**. Clitics can emerge well before CLLD (see Marinis, 2000; Tsimpli, 2005; Babyonyshev & Marin, 2006: for other supporting data); **delay with CLLD thus *inheres* in CLLD**.

- Case particularly strong for Simon's development (see below).

Table 10: Emergence of topics/foci, clitics, CLLD and Top > Wh structures

	Top/Foc	Reflexive clitics	Object clitics	CLLD	Top > Wh
HEL Italian	2;05.00 file 8	1;09.09 file 1	2;00.01 file 3	2;07.08 file 10	2;05.00 file 8
SIM Spanish	2;08.06 file 27	1;11.09 file 15	2;03.17 file 19	3;03.12 file 33	3;00.10 file 30
AUR Italian	2;04.10 file 10	2;07.16 file 15	2;01.23 file 9	2;04.10 file 10	2;04.10 file 10
CAR Italian	2;06.09 file 15	1;10.08 file 3	2;04.21 file 14	2;06.09 file 15	2;08.00 file 18
LUC Italian	2;03.24 file 18	2;04.16 file 20	2;03.24 file 18	2;10.10 file 29	2;08.08 file 28
LUK Italian	2;01.03 file 9	2;06.18 file 16	2;04.09 file 12	2;06.18 file 16	2;08.26 file 20
MAR Italian	2;00.16 file 10	2;00.16 file 10	2;00.16 file 10	3;05.11 file 40	2;06.10 file 20

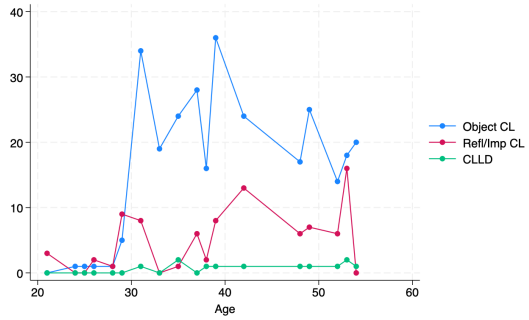


Figure 7: Development of object and reflexive/impersonal clitics and CLLD in Heleen's Italian

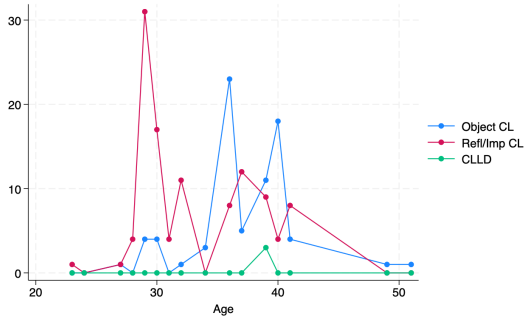


Figure 8: Development of object and reflexive/impersonal clitics and CLLD in Simon's Spanish

4 Discussion and proposed analysis

Data presented supports **two (existing) generalisations** (from Bosch, 2023a; Bosch & Biberauer, 2024) and **corroborates existing data showing topic-acquisition discrepancies** in Germanic *vs* Romance[2] (the latter to be expanded with comparative data into a broader generalisation in §5).

Empirical generalisations

Early Acquisition of CP. (Some) CP-structures emerge early on in the developmental data.

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.

L1-dependent Topic Development (first version; *not* new). Topics are not acquired universally late crosslinguistically. Germanic topics have a clear advantage over Romance topics.

Why the data is consequential for theoretical approaches to acquisition

- **Bottom-up maturation**

  ! **Problem**: early CP-structures (of any kind) unexpected in earlier bottom-up maturational approaches (e.g., Radford, 1990).

[2]See, i.a., Boser et al. (1992); Poeppel & Wexler (1993); Guasti (1993); Tsimpli (2005); Westergaard (2009); van Kampen (2010); Grinstead (2004).

! **Problem**: early topics and other structurally high elements (illocutionary complementisers) unexpected in Friedmann et al. (2021).

! **Problem**: *systematic* patterns of crosslinguistic developmental variation (see, particularly, §5) are (i) incompatible, and (ii) unaddressed.

- **Continuity** (e.g., Boser et al., 1992; Poeppel & Wexler, 1993) and **Inward maturation** (e.g., Heim & Wiltschko, 2021)
  - Supported by early evidence for CP, BUT:
  - ! **Problem**: no explicit theory of developmental variation; hence, *without further elaboration*, systematicities w.r.t topic-development crosslinguistically are *accidental*.
  - → Must be expanded/supplemented, or another theory altogether may be preferable.

→ **Our proposal** (further corroborated in §5): *leveraging neo-emergentist approaches to acquisition/variation*.

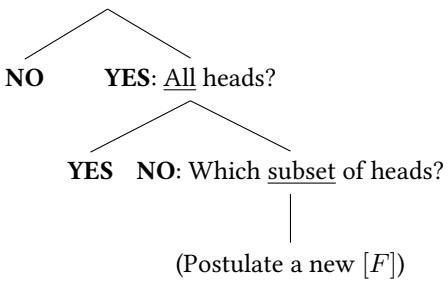
4.1 A and A' signatures of topics and a neo-emergentist analysis

→ Neo-emergentism provides a theory that predicts *both* developmental universals and systematic developmental variation.

Neo-emergentism in a nutshell

- *Emergentist generative approach* (Biberauer, 2011; Biberauer & Roberts, 2015; Biberauer, 2019): **minimal UG**, no innate categories.
- Development accounted for by the interaction of the **three factors** (Chomsky, 2005; Biberauer, 2019) → UG, intake and principles of data analysis/general cognition (e.g., Maximise Minimal Means).
- **Maximise Minimal Means** (Biberauer, 2019): one general-cognitive bias, two (of several) language-specific manifestations.
  1. **Feature Economy** (FE; generalised from Roberts & Roussou, 2003)
     Postulate as few $[F]$s as possible to account for the PLD.
  2. **Input Generalisation** (IG; adapted from Roberts, 2007; termed *Feature* Generalisation in Biberauer, 2020)
     Maximise available $[F]$s.
- **Minimax nature** → be conservative when positing $[F]$s, but liberal in generalising already-existing ones – NO>ALL>SOME learning path.

(13) The NO>ALL>SOME learning path



↪ Macro-parametric properties of a language (= featurally-simpler ones) access *before* micro-parametric ones.

- This predicts the two broad patterns observed w.r.t. universals and variation.

  - **Early CP**: 'coarser-grained' categories acquired first, e.g., 'phasal' categories, Core Functional Categories (Biberauer & Roberts, 2015) → early CP, *developmental universals*.
  - **L1-specific Topic Development**: MMM-driven system and sensitivity to initial conditions → *L1-specific developmental variation* correlating with the *parametric form or 'size'* of a given structure/operation in the relevant L1.

- **Which 'parametric' form?** Topics show distinct A/A' featural properties crosslinguistically.

A and A' properties in Germanic and Romance topicalisation

Table 11: Ā- vs. A-movement (van Urk, 2015: 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

- **Germanic:** XP-movement of topic in V2, treated as *pure A', operator movement* on a par with wh-questions/foci, like English topicalisation (Koster, 1978; Haegeman, 1996, 2012), because it displays *A'-movement* properties

  → **'A'-properties'**: (i) no anaphoric binding, (ii) obligatory reconstruction for Condition C, (iii) it is subject to locality restrictions, and (iv) it licenses parasitic gaps (for exemplification, see Grewendorf, 2005).

- **Romance:** CLLD shows a *mix of A and A' properties*, (traditionally) treated *non-operator, non-quantificational A'-movement* (e.g., Cinque, 1999), unlike focus movement (see also Bhatt & Keine, 2023; Chierchia, to appear).

  → **'A'-properties'** Sensitivity to strong islands.

  → **'A-properties' and base-generation properties**: (i) lack of WCO effects, (ii) inability to license parasitic gaps, (iii) insensitivity to weak islands.

- **How this gets the patterns:**

  - Topicalisation as two distinctly-manifested movement dependencies in Germanic and Romance → **CLLD requires a two-way distinction** between *operator* and *non-operator* topics in the system (or 'pure' A' *vs* 'mixed' A/A' topics), which is not made in other languages → **featurally more complex system in Romance**.

    → Per above, **'minimal description length' preferred** (i.e., minimal feature postulation), so **finer-grained featural distinction are acquisitionally harder**.

Note:

- Continuity and Inward Growing proposals are compatible with this explanation, similarly also approaches advocating for a UG-given functional *template* (e.g., Ramchand & Svenonius, 2014; Wiltschko, 2014).

- Our case for neo-emergentism is then *broader*: neo-emergentism can be used to account for the entire data patterns (our approach here), or, alternatively, it should be leveraged as a way to supplement other existing approaches.

- Our emphasis here is **on the need for a theory of development that explicitly predicts the crosslinguistic variation observed the way neo-emergentism does**.

5 Extension to crosslinguistic monolingual data

What we have shown so far:

- There is evidence for early CP-structures across the children/languages studied (this extends to the other 5 children not presented in this paper, which remain ongoing work).
- A significant contrast in individual bilingual children: Germanic topics are early acquired, Romance topics (CLLD) are late acquired → plausibly due to typological differences in topicalisation in these L1s, namely operator *vs* non-operator properties of topics (§4).

→ Question: how do other languages pattern?

This section: this analysis plausibly **extends to a significant number of typologically-diverse languages**, beyond Germanic and Romance.
Analysis of monolingual acquisition data from 10+ languages: French, European Portuguese, Mandarin Chinese, Japanese, Korean, Catalan, Greek, Hebrew, Brazilian Portuguese and, briefly, English[3].

→ **The key upshot: 'late' topics reported in maturational work turn out to be *epiphenomena* of L1s studied**, *not* a result of maturational constraints on the left periphery.

→ **Novel (refined) generalisation about crosslinguistic topic-development**

We consider first languages where topics have been argued to be **base-generated** or **adjoined**, and then move to those with **operator movement**:

- **French**
  - French dislocation displays **absence of movement effects** (de Cat, 2007b): no parasitic gap licensing, lack of Condition C effects, island insensitivity.
  - Adjunction account in de Cat (2007b). Base-generation account in Wolfe (2021) → no movement-triggering $[F]$.
  - de Cat (2000, 2007a) shows **very early acquisition** of French dislocation.

(14) a. Max 2;0.14 (MLUw 1.83)
lui@d, ça va là
him it goes there
'That one goes there.'

b. Anne, 1;10.12 (MLUw 1.84)
Mimi, elle va toutoutou@s toutoutoutou@s
mimi she goes tootootoo tootootoo
'Mimi goes tootoot.' (Imitating a train)

c. Tom 2;1.11 (MLUw 2.28)
0 est pas une fille, isabelle
is not a girl Isabelle
'Isabelle's not a girl.'

(de Cat, 2002: 259, 260, 265)

↪ **Adjunction** independently known to **play important role early on** in acquisition (Lebeaux, 1988; de Villiers, 1991; Hoekstra & Jordens, 1996; Roeper, 1992; Biberauer, 2018).

[3] If you know of data on topic acquisition in other languages, please let us know! ☺

- This is as expected under our account → no need for $[F]$-posulation for French topics, implying system with lower Kolmogorov complexity, whence early acquisition anticipated.

- **European Portuguese**
  - EP permits both CLLD and (clitic-less) topicalisation (Kato & Raposo, 2007).
  - Soares (2003b,a, 2006) examines acquisition of the CP in EP → topicalisation among the first CP-structures acquired, but crucially only *clitic-less* topicalisation (not CLLD) is reported as early.

(15) *European Portuguese*, Marta 1;8.18 (MLUw 1.5)

a. Marta: N(ã)o (es)tão dodot.
not are dodots
'Dodots are not here'
Marta: **Dodot** não há!
Dodot not have
'There are no dodots' (she is talking about a baby towel's empty box.)

b. Marta: Este!
this
'This one!' (she takes a part of a puzzle.)
Mother: ah # ainda não é daqui.
INTJ belong not this here
'This one does not belong here'
Marta: **Este** pôr.
this put
'I am going to put this one here'

(Soares, 2003a: 133)

- This contrast is significant → **topics** analysed as involving **operator movement** (Duarte, 1987; Raposo, 1997); it licenses parasitic gaps, shows WCO effects, among others. **CLLD** behaves as **non-operator movement**, as in Romance CLLD more generally.

↪ From the above, we expect topicalisation to be acquisitionally earlier than CLLD. This is what we find[4].

- **Mandarin Chinese, Japanese and Korean**
  - Zhu & Gavarró (2019): production of **null topics in Mandarin** is **adult-like very early on** (before 1;8, MLUw ~2.0), with later development showing little to no changes in distribution[5].
  - Hu et al. (2018): acquisition of **topic markers** in Mandarin proceeds **first via base-generation**, then entertain a movement analysis.
  - In **Japanese**, **early acquisition of null topics** (subjects and objects) and **topic markers** is reported in Kurumada (2009), at 2;0 (though cf. Hirakawa, 1993, for data indicating later acquisition in other children).
  - **Early topic** and **focus markers** in **Korean** infants from 1;07 (Lee, 2001).
  - **All three languages**: topicalisation generally treated as operator movement or base-generation (Hoji, 1990; Park, 1998; Kizu, 2005; Miyagawa, 2017a,b) → early emergence predicted.

[4]This is plausible for EP topics, given the lack of data for early CLLD in Soares (2003a). Note, however, that for EP CLLD this is an argument based on *absence* of attestation in the data reported. More data collection on both EP non-CLLD and CLLD topics is needed to establish this with more certainty.

[5]Though NB limitations involved in generalising from null elements.

Commonality in languages thus far: parametrically simpler 'settings' (adjunction, base-generation, operator movement). **All acquired early**.
We now present data with languages displaying **non-operator movement**, both with and without CLLD (Catalan, Greek, Hebrew and Brazilian Portuguese), and show for each in turn that their acquisition is **late**.

- **Catalan**
  - As with Sp. and It. here, CLLD language, thus with topics with non-operator properties.
  - Laura and Gisela (Bosch, 2023a)
    - First CP-structures emerge at 1;10 and 2;04 (MLUw 1.15 and 1.58), respectively.
    - CLLD at 2;08 for both (MLUw 1.88 and 2.61, respectively).
- **Greek**
  - Another CLLD language.
  - Alexia and Elli (Tsimpli, 2005)
    - Wh-questions and focusing emerge earlier, at 1;11 and 1;9, respectively.
    - CLLD at 2;1 and 2;0.
  - Janna, Maria and Mairi (Marinis, 2000)
    - Single clitics emerge first 1;11 for Janna, 2;03 for Maria, and 1;09 for Mairi.
    - CLLD emerges at 2;09 for Janna and Maria, and 2;03 for Mairi (no focusing data reported).

The two final languages we consider are Hebrew and Brazilian Portuguese.

! At first sight, **apparent counterexamples** to the above.

→ We show they actually further **strengthen** a formal complexity account of topic-acquisition.

- **Hebrew**
  - **Why apparent counterexample?** Lacks CLLD, displays no formal difference between left-peripheral topicalisation and focalisation → often indicator of operator properties (viz. English).
  - ! Acquired late in Friedmann et al. (2021) (2;6 at the earliest)!
  - **This is merely superficial**: **Hebrew topics share several of the distributional properties of non-operator movement**, like CLLD.
    - No WCO effects (**A-property**), ability to co-occur with operators like wh-questions and focalisation, as well as imperatives and interrogatives (Borer, 1995; Shlonsky, 2014).
    - They license parasitic gaps and reconstruct for anaphor/pronominal binding, both **A'-properties**.

  ↪ Non-operator/non- quantificational, A'-movement.
- **Brazilian Portuguese**
  - **Why apparent counterexample?** Non-resumptive topicalisation, like Hebrew, following the loss of 3rd person clitics.
  - ! Late acquisition reported in Meira & Grolla (2023), consistent with Friedmann et al. (2021): topicalisation emerges considerably after wh-questions (2;2 vs 1;7)[6].
  - Closer inspection reveals again that **Brazilian Portuguese topics display non-operator, mixed A/A' properties**:
    - Topics can co-occur with Wh, and do not present WCO effects (Modesto, 2015; Lacerda, 2020: 73-75).

[6]One could contest whether 2;2 is an age associated with 'late' developments. Nonetheless, wh-questions do emerge significantly earlier (at 1;7), well before topics, and subordination emerges relatively early (2;04), compared to other children discussed here. The child is, plausibly, an early-talker. We will follow Meira & Grolla in treating the BP topics in this child as genuinely 'late'. More data collection may be desirable to disambiguate their development in other children.

  - Interactions between A- and A'-properties in BP's CP: Kobayashi (2020): topicalisation (among other CP-structures) displays 'interleaved movement' (an improper chain of A- and Ā-steps of movement).
  - Lohninger (2021): TopicP in BP with mixed [A/Ā] featural properties (see also Lohninger et al., 2022).
  - Dias (2024): canonical overt subjects in BP display mixed A/Ā behaviour, following Bošković's (2024) A/ĀP projection.

→ Both languages' acquisition timelines (late) follow from the proposal outlined.

→ In turn, this reveals **one significant result**:

  – The **minimal pair** with European and Brazilian Portuguese indicates **lack of clitic dependencies** in topicalisation **does *not*** always **correlate** with ***early*** acquisition (recall also §3.2.2), suggesting a more nuanced account, e.g. based on the A/A', operator/non-operator distinction, is to be favoured.

Learnability side-question:

What cues the distinction between, e.g., operator and non-operator topics for the child?

- A/A'-diagnostics like WCO effects, Superiority, parasitic gap licensing, will *not* be in the input (Pearl & Sprouse, 2013).
- One possibility: **lack of intervention effects** with other operators (see also Biberauer & Roberts, 2015; Cournane & Klævik-Pettersen, 2023).

↪ Topic > Wh orders or Topic > Foc sanctioned in the languages with non-operator topics surveyed, and at least the former may be expected to be reasonably frequent in the input[a] → these signal that topics can co-occur with operators, so must be featurally (partly) distinct.

↪ Compare operator topics: impossibility of (hence, lack of positive evidence for) co-occurrence of topics and other operators → will never trigger a distributional contrast between topics and other operators (i.e., a 'departure from Saussurean arbitrariness'; Biberauer, 2019) → all things equal, postulation of a formally distinct, non-operator feature should only ensue in the former scenario.

[a] An impressionistic analysis of parent data in CHILDES for languages like Catalan and Spanish suggests the expectation above is not implausible.

But could this be all about input frequency?

→ Some evidence to think frequency is not likely to be the main driver behind these patterns. Much more crosslinguistic data needed, however.

- de Andrade (2015) reports European Portuguese Topicalisation and CLLD roughly *equally frequent* in recent diachronic corpora → suggestive, **same frequency but different acquisition timings**. EP topicalisation produced early, CLLD (in Romance generally) late-acquired.
- Devlin et al. (2015) report a case of an English-Italian-Scottish Gaelic, whose English is influenced by Italian CLRD constructions, which are very frequent, just like CLLD → must be frequent/salient enough to impact another L1.
- Crocco (2010) reports frequencies of CLRD that are high as 0.5 per minute in some dialects (from Catazanaro and Genova). Hidalgo (2000) notes Italian CLRD and CLLD is equally frequent.
- Slabakova & García Mayo (2015: 214): 'CLLD may be 1000 times more frequent in Spanish than Topicalization is in English'.
- Pontes (1987) describes Brazilian Portuguese topics as 'very frequent' (impressionistically, requires further confirmation).

6 A novel generalisation on topic-development: implications for theories of acquisition

Summary of points so far

- **Acquisition timings** of topics across all languages studies is **variable**: both *early* and *late* topics observed, *within a single (bilingual) individual.* Important role of the L1 in shaping developmental trends ('sensitivity to initial conditions').

↪ **Key implication**: topic-development cannot *cannot* be subject to rigid biological constraints as in bottom-up maturation. Endorses central insight of continuity and inward maturation (early CP).

- Importantly, our results appear to concern rather *abstract* formal properties of the topics in question:
  - The patterns do not directly concern clitic development:
    - Clitics can be acquired before CLLD (Study 2).
    - Contrasts/pairs like European *vs* Brazilian Portuguese: superficially 'identical' topicalisation strategy (left-dislocation of an XP without clitic resumption), but *distinct* acquisition timings.
  - Neither do they concern (just) *moved* vs *non-moved* topics; or V2 topics in Germanic only, the patterns generalise crosslinguistically.
  - Possibly also not (exclusively) frequency-driven, though this requires additional corroboration.

→ Instead, we proposed topic-development systematically 'tracks' **L1-complexity**, including those languages which had been argued to support maturational proposals.

Table 12 takes stock of the conclusions extracted from the comparative data on the development of topicalisation.

Table 12: Topicalisation strategies, their acquisition and their formal complexity

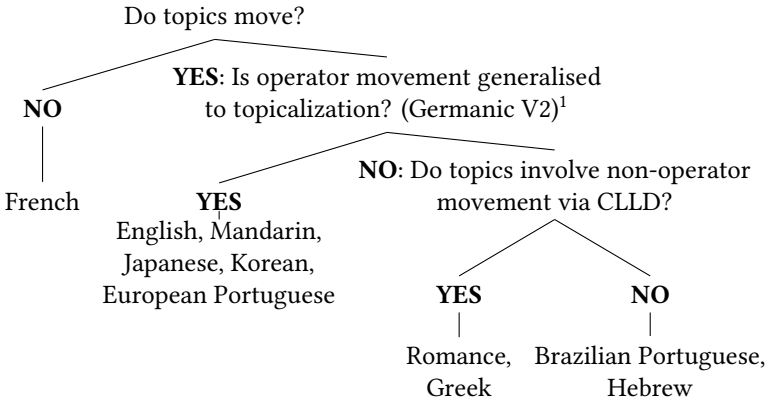
Language	Acquisition	Formal characteristics of topicalisation	Parametric complexity
French	Very early	Adjoined or base-generated	Macroparametric
Germanic V2	Very early	Generalised V2 diacritic	Mesoparametric
Mandarin Japanese Korean	(Possibly) early	Operator movement or base-generation[7]	Mesoparameter
European Portuguese[8]	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

We schematise the patterns in terms of a crosslinguistic acquisition hierarchy of topics, as below.

↪ This hierarchy **follows from the acquisitional pathways predicted by neo-emergentism** as outlined in §4, notably Biberauer & Roberts (2015) and earlier references therein, and so gives a rationale for its empirical existence: featurally-simpler hypotheses are easier to acquire.

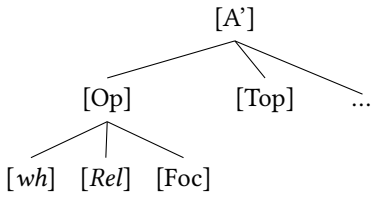
[7] Depending on theoretical analysis
[8] Non-CLLD topics only.

(16) Parametric complexity in topicalisation structures considered



- Note how the acquisition path proposed bears resemblance to feature geometries in the A' domain (Starke, 2001; Rizzi, 2004; Abels, 2012; Aravind, 2017):

(17)



(Aravind, 2017: 335)

- We can now restate the conclusion in §4 in terms of a ***broader* generalisation**, which pends further empirical corroboration.

L1-dependent Topic Development (final version; new!)

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).

Future extensions

→ Question: Can our analysis be extended to **other structures with mixed [A/A'] properties**? (scrambling, Austronesian pivots, etc.)

→ Question: What's the role of the **input and/or frequency** in these and other languages? (more data needed) And is there **crosslinguistic influence** in bilinguals?

- Preliminary evidence from **English monolinguals and bilinguals**.
  - English left-dislocations **very restricted** in distribution (in Snider & Zaenen, 2006, 1% of their spoken data).
  - **Operator movement** (Haegeman, 2012), but **very infrequent** in PLD → should have acquisitional consequences.
  - Initial evidence for this → **late** acquisition of **English topics** in **monolinguals**, relative to French infants, but **earlier emergence** in **English/French bilinguals**, due to crosslinguisic transfer (Notley, 2004; Notley et al., 2007; van der Linden & Sleeman, 2007).
  - See also Devlin et al. (2015) on English-Italian-Scottish Gaelic trilinguals and right-dislocation/*it-doubling*.

→ More broadly, do **other structures**, beyond topicalisation, show systematic crosslinguistic variation in acquisition and, if so, can neo-emergentism explain this variation?

[8] In Germanic, operator topics fall out from its generalised V2 system, unlike the other languages considered, hence its parenthetical placement.

7 Conclusion and implications

New (ongoing) corpus study on 7 bilinguals, two presented here.

- Inherent 'vulnerability' of (part of) the CP (Radford, 1990; Rizzi, 1993; Friedmann et al., 2021; Hulk & Müller, 2000)? We argued 'no' regarding its *syntax* and *representation* → **early development of CP structure**.
- Theoretical **significance** of 'flexible' or **'variable' acquisition timings** of CP-structures, beyond universals – focus on **topicalisation** here.

  → 'Late' topics *not* a developmental universal, their development is *L1-dependent*.
- Critical theoretical requirement: predictive power for *both* developmental universals and variation.

↪ We argued for the explanatory potential of **neo-emergentism** in this domain, and applied it to the development of topics.

- Significant insights to be gained from a **comparative** approach to acquisition: bilingual and multilingual data sheds important light on the *biologisation issue*.

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