Parallel evolution of relative clauses in Indo-European

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Introduction

- We document a case of parallel evolution: recurring independent grammatical change in similar contexts in related languages.
- The case study is the emergence of headed relatives with interrogative heads in several Indo-European languages and a few unrelated neighbouring languages.
- The distribution of this construction is conditioned both genetically and areally.
- So this case of parallel evolution implies conclusions about both first and second language acquisition.
- A key question in this talk is: Why do we find parallel evolution *here*? Where else might we find it?
- Our conclusion is that this complex diachronic process is a product of regular language change in a particular type of syntactic and semantic context.

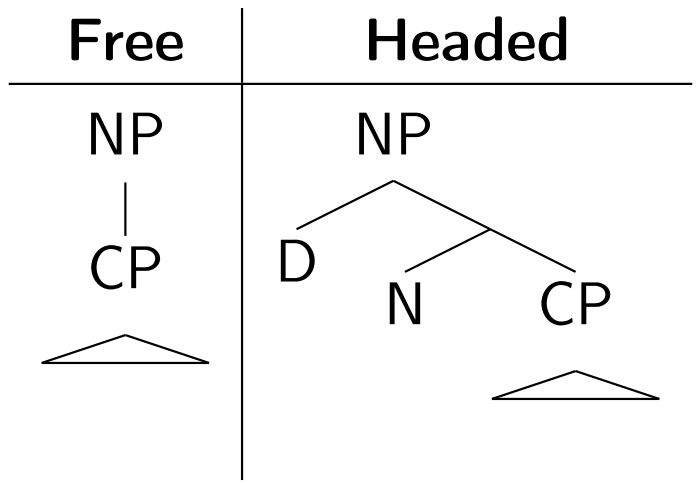
Section 1

Preliminaries

Free vs. headed relatives

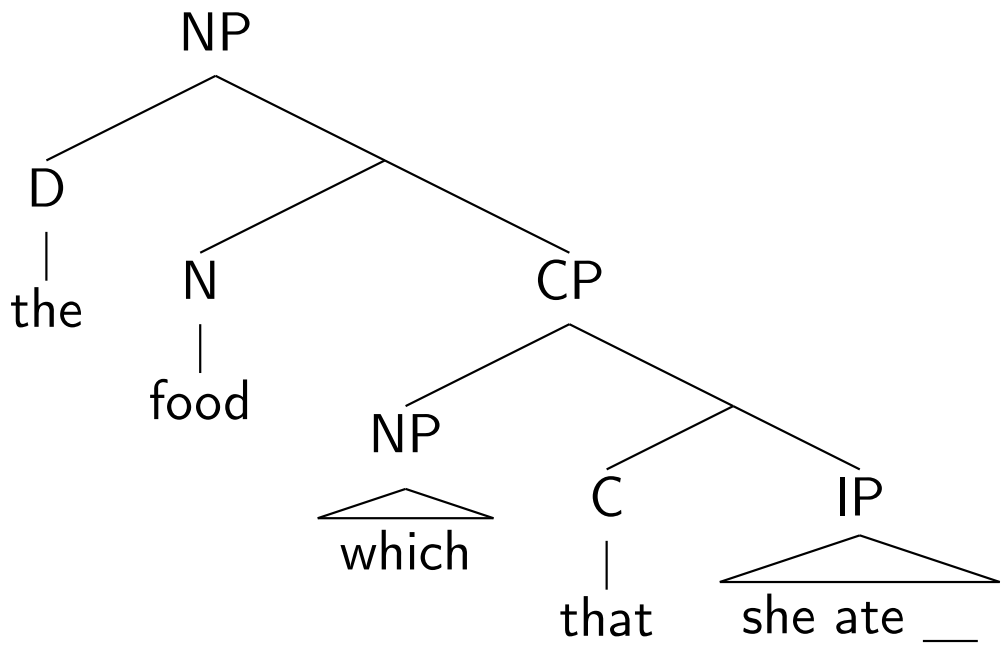
(1) a. Free relative: I'll have [what she's having]
b. Headed relative: I'll have [the thing [that she's having]]

- A free relative is a CP with the external distribution of an NP.
- A headed relative is a CP that modifies a noun.



Relative specifiers vs. relative complementizers

- The relative CP could have a filled [Spec,CP] (a relative specifier), a filled C^0 (a relative complementizer), both or neither.



The food	$\emptyset$	which	she ate.
	that	which that	

Properties of relative specifiers

1. Relative specifiers are phrasal:

   (2) a. The kid [whose sister __ threw eggs at you]
   b. The shield [under which you hid __]

2. Relative specifiers often exhibit connectivity (properties of relative specifiers are determined by the location of the gap).

   (3) Ich fürchte den Herrn [der ____ eine Pistole trägt]
   I fear the.ACC man.ACC who.NOM a gun carries
   'I fear the man who carries a gun' (De Vries 2002: 118)

NB: Relative specifiers are a proper subset of the traditional class of relative pronouns: some relative pronouns are monomorphemic, and so plausibly not specifiers.

Properties of relative complementizers

1. Relative complementizers are monomorphemic.

(4) a. *The kid [that's sister __ threw eggs at me]
b. (i) The shield [that I hid under __]
(ii) *The shield [under that I hid __]

2. Relative complementizers are often invariant (no connectivity).

(5) a. The shield [that __ saved me]
b. The shield [that I cowered under __]

NB: Relative complementizers are a proper superset of the traditional class of relative particles — see previous slide.

The acquisition of function words

- Acquisition of content word meaning has been extensively investigated.
- But content words are the easy ones.
- Functional vocabulary like *which* and *that* is harder in many respects.
  - Ambiguity is the norm.
  - Mutual exclusivity not such a strong pressure.
  - Miscommunications less obvious and/or less serious.
  - Pairings between category and denotation more fluid.
- Learners are quick to figure out that *which* is a word.
- But it is much harder for them to answer a question like 'What does *which* do?'.

Relative specifiers crosslinguistically

- Relative specifiers can be formed around interrogative phrases, demonstrative phrases, or 'special' forms.
- All are vanishingly rare in headed relatives outside of Indo-European.

	IE	Other
Spec	25 (62.5%)	8 (6.1%)
Int	*16 (40%)*	*3 (2.3%)*
Dem	*4 (10%)*	*0 (0%)*
Sp	*5 (12.5%)*	*0 (0%)*
No Spec	15 (37.5%)	124 (94%)

Table 1: Headed relative specifiers in 172 languages (based on De Vries 2002)

- Demonstrative relative specifiers are only found in Germanic languages in De Vries' sample.
- 'Special' relative specifiers include South Slavic forms related to interrogatives, and unrelated Indo-Aryan *jo* forms.

Interrogative relative specifiers

- Headed relatives with interrogative specifiers (henceforth: *wh*-relatives) are more interesting.
- De Vries states that they are found in:
  - Multiple branches of Indo-European (Romance, Germanic, Slavic, . . .);
  - A handful of languages in contact with IE (Georgian, . . .);
  - A couple of languages unrelated to IE (Bambara, Tzeltal, . . .).
- However, Proto-Indo-European probably did not have them (it probably did not have headed relatives at all, Clackson 2007)
- This raises several questions:
  1. Why are *wh*-relatives so rare?
  2. How did they become so common in Indo-European?
  3. What role does contact play in their spread?

  Considering these questions provokes a fourth question, which we'll tell you about later.

The role of contact

- Comrie (1998) identifies relative pronouns (including *wh*-relatives) as a European areal type, whose distribution is explained by contact:

> Johanson (1992) suggests that two factors are important in promoting the borrowing of a construction into another language: the construction may be structurally 'attractive', and thus likely to be borrowed even in the absence of strong cultural pressure, or it may be that the prime motivation for its borrowing is cultural pressure from the dominant language; I suspect that the spread of European-type relative clauses is an instance of the latter. (Comrie 1998: 78)

- Comrie must be right to an extent: relative pronouns are not geographically randomly distributed.
- But:
  - Cultural pressure is too vague, and implausible in this case.
  - Indo-Aryan languages have 'European-type' relatives, and are not in Europe.
  - An areal distribution doesn't tell us what was borrowed, in what circumstances.

Section 2

Parallel evolution

Innovations can recur

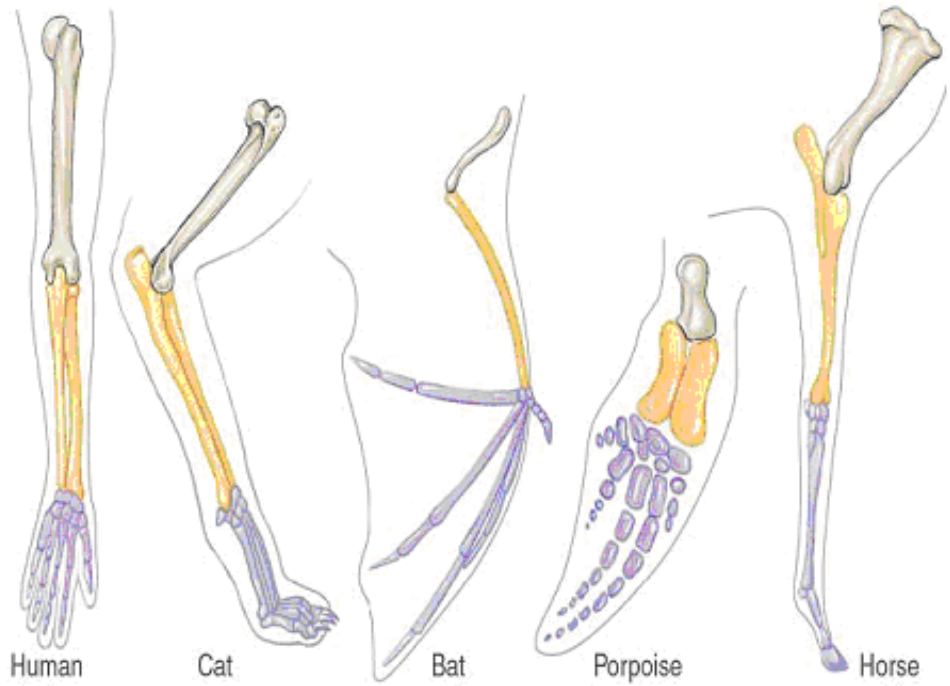
- If inheritance cannot explain everything, and contact cannot explain everything, then *wh*-relatives must emerge repeatedly.

(6) de fout wie hun eigenlijk maken
the mistake who they actually make
'the mistake which they actually make'
(Johan Cruyff, via Boef 2012)

(7) adnominal adjectives (those who are not modifying the noun predicatively) (Belk 2016: 179)

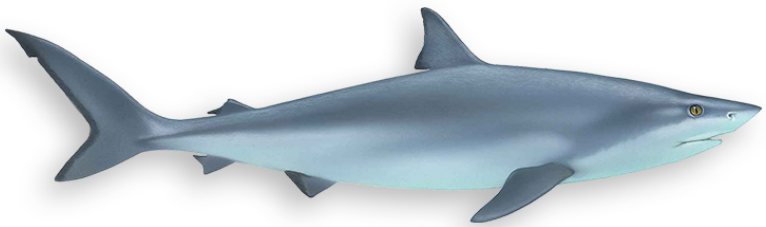
- This is parallel evolution.

Divergent evolution



English	Latin	Sanskrit	Old Irish
mother	māter	mātár	māthir
father	pater	pitár	athir
brother	frāter	bhrátar	brāth(a)ir

Convergent evolution



Shark (fish)

Dolphin (mammal)

Ichthyosaur (reptile)

	head	**reflexive**
Fulfulde (Niger-Congo)	hōre	hōre māko
Hausa (Chadic)	kaì	kânsù
Basque (isolate)	buru	bere burua

(Heine & Kuteva 2002)

Parallel evolution


- Daughter languages contain cognate forms.
- These cognate forms repeatedly develop similar new functions.
- The form–function relation is less common in genetically unrelated languages.
- Our fourth question is:
  4. How does parallel evolution work?

The relationship between form and function

- There is a debate about the extent to which grammatical change is a matter of functions attracting forms.
- Convergent evolution is an example of this: it's useful for languages to have reflexives.
- This is why change is often directional: in no language do reflexive pronouns become content nouns meaning 'head'.
- A key point in our work is that the emergence of *wh*-relatives, as an example of parallel evolution, work the other way round. The forms develop new functions.

The relationship between form and function

- This means that we investigate the emergence of *wh*-relatives by tracking the use of descendents of PIE **k^{w}i-/k^{w}o-*, not by tracking the diachrony of relative clauses (Gisborne & Truswell 2017). Compare:

> 'distinct [relativization] strategies in [a complementary] relationship are no more different than complementarily distributed allophones. And just as different allophones of a particular phoneme are phonetically similar to each other, different [relativization] strategies in a given language must be syntactically similar.' (Maxwell 1982: 142–3)

> 'I take it that a language like Dutch is an instance of a 'mixed' language only in the sense that it uses both interrogative and demonstrative pronouns rather than one or the other set exclusively. Otherwise, Dutch can be regarded as having one strategy for relativization, namely pronominalization.' (Romaine 1984: 439)

Ingredients of parallel evolution

- Parallel evolution requires two ingredients:
  1. A distinctive initial state;
  2. Something to motivate a statistically nonrandom pattern of changes.
- Here, the distinctive initial state is something about the grammar of PIE **k^{w} i-/k^{w} o-*.
- To understand the parallel evolution of *wh*-relatives, we need to get to grips with:
  1. Distinctive properties of the above
     - ('Why are *wh*-relatives so rare?')
  2. Constraints on grammaticalization, which prevent change from diverging too much
     - ('How did they become so common in Indo-European?')
  3. Properties of contact-induced change, to develop alternatives to Comrie's 'cultural pressure' claim
     - ('What role does contact play in their spread?')

Starting point: Properties of PIE

- We assume three relevant distinctive properties of PIE:
  1. *kʷi-/kʷo-* were 'indefinite–interrogatives' (Haspelmath 1997).
  2. As indefinites, they are found in specific syntactic/semantic environments (Yanovich 2005).
  3. PIE had left-adjoined conditional structures, in which *kʷi-/kʷo-* could appear.
- These properties entail that the same string can be interpreted as a 'universal' correlative or a conditional + *wh*-indefinite.

(8)

yasya	yat	paitṛkam	ritkam	sa
who.GEN	what.NOM	paternal.NOM	inheritance.NOM	he.NOM
tad	gṛhnīta,	netaraḥ		
that.ACC	should.get	not.another		

'Of whom what is the paternal inheritance, he should get it and not somebody else.'
'If someone has something as a paternal inheritance, then he should get it and not someone else.' (Sanskrit, Andrews 1975)

One pathway to headed relatives

- Belyaev & Haug (2014)'s pathways for *wh*-correlatives (based on comparative typological data):
  1. universal > definite (> restrictive) interpretation;
  2. non-obligatory > obligatory anaphoric relation.
- This composes with the correlative > headed relative pathway in Haudry (1973), to suggest one pathway from PIE to headed *wh*-relatives.

(9) Kto ne rabotaet, tot est
who not works that eats
'Whoever does not work eats' (Russian, Belyaev & Haug 2014)

(10) quae pecunia recepta erit, ea pecunia emere . . .
which money received will.be that.ABL money.ABL buy
liceto
will.permit.PASS
'It shall be permitted to buy . . . with the money that will be received.'
(Latin, Belyaev & Haug 2014)

(11) Germani qui trans Rhenum incolunt
Germani who across Rhine dwell
'the Germani who live on the other side of the Rhine' (Latin, Haudry 1973)

Other pathways

- Haspelmath + Belyaev & Haug + Haudry can get us from PIE indefinite–interrogatives to modern IE *wh*-relatives.
- The three properties of PIE identified above play crucial parts in this story, and none are typologically common.
- This therefore suggests an answer to our first question, concerning the distinctive properties of PIE.
- But IE languages don't have to follow this pathway. Many don't.
  - Some IE languages have stopped at various places along the pathway (e.g. Welsh, only has free *wh*-relatives).
  - At least one IE language (English) followed a different pathway to the same endpoint.
- We'll show how what happened in English is different from the above.

Wh-phrases in Old English

- OE *hw*-phrases had three uses:
  1. Indefinites

     (12) and gif hwa hyt bletsað, þonne ablinð seo dydrung.
     and if who it blesses then ceases dem illusion
     'And if anyone blesses it, then the illusion is dispelled'

  2. Interrogative forms

     (13) Saga me on hwilcne dæig he gesingode
     Say me on which day he sang
     'Tell me which day he sang on'

  3. In 'correlatives' and free relatives

     (14) [eal swa hwæt swa ic þe gehet] [eal ic hit gesette]
     all so what so I thee promised all I it appoint
     'Whatever I promised you, I will do it all'

     (15) Gaþ to Iosepe & doþ [swa hwæt swa he eow secge].
     Go to Joseph and do so what so he you.DAT say.SBJ
     'Go unto Joseph; what he saith to you, do.'

Free relatives in final position

- In clause-final position, free *hw*-relatives occur with or without *swa . . . swa*.
- *Swa . . . swa* triggers a generalizing interpretation.
- In its absence, we get a definite interpretation.

(16) Gaþ to Iosepe & doþ [swa hwæt swa he eow secge].
Go to Joseph and do so what so he you.DAT say.SBJ
'Go unto Joseph; what he saith to you, do.'

(17) Gemyne, [hwæt Sanctus Paulus cwæð]
Remember what Saint Paul said
'Remember what Saint Paul said.'

- In terms of external distribution, both types of free relative are just NPs (or more precisely, have the same category as their *wh*-phrase, Bresnan & Grimshaw 1978).
- 'Correlatives' have exactly the same internal structure as generalizing free relatives and are therefore best treated as the same thing.

OE 'correlatives' are not canonical correlatives

- The canonical example of a correlative in the literature is Hindi (e.g. Srivastav 1991).
- Hindi correlatives are biclausal constructions with a range of interpretations like Present-day English relatives.

(18) jo laRkii khaRii hai vo lambii hai
REL girl standing is DEM tall is
'The girl who is standing is tall'

- A hallmark of these canonical correlatives is that they allow multiple correlatives.

(19) jis laRkii-ne jis laRke-ke saath khelaa us-ne us-ko haraayaa
REL girl-E REL boy-G with played that-E that-A defeated
lit. Which girl played with which boy, she defeated him

- English has never had such structures. This follows if OE 'correlatives' are free relative + clause: there are no multiple-*wh* free relatives (Citko 2009).

OE 'correlatives' are conditionals

- Three pieces of circumstantial evidence support this claim:
  - OE conditionals love present indicative morphology (used in 58% of examples, vs. 38% baseline). '*Wh*-correlatives' love it even more (74%). No class of relatives shares this preference.
  - Regular definite NPs are dispreferred in left-adjoined position in OE (c.14%, vs. c.70% baseline). So this is not a canonical topic position.
  - OE *wh*-indefinites like to occur in the antecedent of conditionals (50% of the time), so there is a continuing affinity between *wh*-phrases and conditional interpretations.

(20) [eal swa hwæt swa ic þe gehet] [eal ic hit gesette]
all so what so I thee promised all I it appoint
'Whatever I promised you, I will do it all'
'If I promised you anything, I will do it'

Two pathways to the same place

- Old English 'correlatives' are not like the canonical early IE correlatives seen in Hittite, Sanskrit, Latin, etc. and exemplified above by modern Hindi.
- Instead, it has NPs (generalizing free relatives) left-adjoined to clauses, and interpreted as conditionals.
- However, both the OE construction and the early IE correlatives could give rise to headed relatives.

Section 3

Grammaticalization: Pathways in a locked room

Why isn't there more divergence?

- We have seen that IE languages have followed a range of pathways from a common starting point.
- And yet, an IE relative 'type' has emerged.
- This seems like a paradox.
- We think that the resolution of the paradox comes from the fact that *wh*-phrases are confined within a very limited semantic space.
- Moreover, the interpretation of *wh*-phrases is mutable and sensitive to the local context.
- This increases the odds of different pathways emerging, but converging on the same space.

Choice points in the interpretation of PIE structures

- Our PIE starting point looks like this:

  (21) $[_{\text{XP}} \ldots \textit{Wh} \ldots] [_{\text{Clause}} \ldots \text{(anaphor)} \ldots]$

- Choice points for reanalysis include the following:
  - Is XP a clause or (e.g.) a noun phrase?
  - What is the semantic relation between XP and Clause (topic–comment, conditional, . . .)?
  - Is *Wh* indefinite, definite, or underspecified?
- These choices are not fully independent (e.g. topic–comment goes well with definite NPs, conditionals go well with indefinite NPs).
- The syntactic and semantic choice points are partially independent:
  - By default clauses describe situations and NPs describe individuals.
  - But clauses can also describe individuals (correlatives) and NPs can describe situations (OE conditional 'correlatives').

Choice points and pathways

- A canonical correlative is a way of saying two things about a single entity.
- A canonical conditional is a way of saying two (causally related) things about a single situation.
- But 'situations' can correspond to individuals (Elbourne 2001).

(22) a. If a bishop meets a bishop, he blesses him.

b. $\forall s.[\exists b_1.[\text{bishop}(b_1, s) \wedge \exists s' \supseteq s.[\text{bishop}(b_2, s') \wedge \text{meets}(b_1, b_2, s')]][\exists s'' \supseteq s'.[\text{bless}(b_1, b_2, s'')]]$

- The communicative intentions of these structures are often clearer than the compositional routes through which those interpretations are indicated.
- This is fertile ground for reanalysis.
- The emergence of free or headed relatives are likely outcomes of that reanalysis, because free and headed relatives are yet more ways of saying two things about a single individual.

The role of word order

- Chinese *shenme* has roughly the same distribution as PIE *k^wi-/k^wo-*.

(23) Tā xǐhuan shénme ma?
he like what Q
'Does he like anything?' (Haspelmath 1997: 174)

(24) Ni dapo shenme, jiu de qu mai shenme lai pei.
you break what then must go buy what to compensate
Lit.: 'If you break what then you must go to buy what for compensation.' (Lin 1999: 574)

(25) *Wǒ hòuhuǐ zuo shénme (shìqing).
I regret do what thing
'I regret having done something.' (Haspelmath 1997: 174)

- Chinese has the right semantic ingredients, but not the right word order, for *wh*-relatives to emerge.
- Except in its placement of verbs, Chinese is strictly head-final. This gives rise to prenominal relative clauses with an invariant marker, typical of head-final languages.

The role of word order

- The shift from OV to VO is probably central to the emergence of *wh*-relatives. Hendery (2012: 203) gives the following three generalizations.
  1. VO > postnominal relatives;
  2. prenominal relatives > OV;
  3. correlatives > OV.
- However, the emergence of *wh*-relatives in languages which are not rigidly OV is more than a matter of conforming to type.
- Latin is by default OV but with (a) default N–modifier order; (b) significant word order freedom in the clause.
- So the string . . . N XP allows for reanalysis of XP as a postnominal relative.
- Chinese has rigid modifier–N order, so no scope for reanalysing clause-final XPs as relatives.

The locked room

- The semantic space occupied by IE indefinite–interrogatives is a limited and largely encapsulated one.
- But still, the PIE initial state only occupies a subpart of this space.
- There are many ways to grow from this initial state, but the growth will tend to be in similar directions.
- The result will then be repeated independent emergence of similar constructions.

Section 4

Implications for borrowing

What could be borrowed?

- Comrie (1998) must be right that borrowing has a role in the distribution of *wh*-relatives.
- But given the narrow space of possible diachronies outlined above, this doesn't entail borrowing of *wh*-relatives.
- Borrowing anything along the pathways outlined above is likely to lead to emergence of *wh*-relatives.
- This opens the door to a wider range of borrowing scenarios, some of which are consistent with motivations in terms of 'structural attractiveness' rather than 'cultural pressure'.

What could be borrowed?

- How do we evaluate these different scenarios? Two considerations:
  1. What is 'structurally attractive' ($\approx$ what increases the expressivity of the target language)?
  2. What is learnable?
- It seems to us that abstract morphosyntactic feature clusters, such as those associated with relative *which* in English, aren't obviously learnable by second-language speakers, or obviously useful (most languages don't relativize low-accessibility functions, Keenan & Comrie 1977).
- Perhaps earlier stages on the pathway are more structurally attractive (because more polyfunctional) and more learnable (because parataxis isn't hard).
- Hungarian, Georgian, etc. have *wh*-correlatives as well as headed *wh*-relatives. The same is true of Bambara.

Conclusion

- Parallel linguistic evolution is a thing.
- It looks complex, but is just a product of regular language change in complex grammatical territory.
- The recurring emergence of *wh*-relatives in Indo-European is an example, but not the only one.
- Parallel evolution should not always be reduced to contact.
- We expect to find parallel evolution in areas of grammar with particular properties:
  - Opaque syntax–semantics mappings;
  - Complex compositional interactions between multiple elements;
  - 'Locked rooms': encapsulated semantic territories.
- In such environments, acquisition is difficult, in different ways for first and second language acquisition.
- This leads to different consequences for endogenous parallel change on the one hand, and borrowing on the other.

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