

# Nanosyntax and semantics of relative pronouns

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# Research questions

## Main question

What is the morphosyntactic and semantic representation of (cor)relative pronouns and the morphemes that derive them from interrogative pronouns?

- (1) a. *koj* 'who/which' interrogative  
b. *kojto* 'who/which.REL' (cor)relative

## Subquestions

- What is the distribution of relative morphemes in different constructions and languages?
- How can the distribution be modeled in (nano)syntax?
- What is the relation between relative morphemes and the morphemes deriving indefinites from *wh*-words?

Motivation and aim

Constructions

Morphology

Syntax–semantics

# Motivation and aim

Constructions

Morphology

Syntax–semantics

## Motivation: int → ind

We know a lot about how **interrogative pronouns** (aka wh-words or indeterminates) give rise to **indefinite pronouns** and esp. how the syntax–semantics interface works.

	English where	Czech where	Hungarian who	Japanese who	Chinese what/which
Q	where	kde	ki	dare	shénme
∃	somewhere	někde	valaki	dare-ka	shénme
∀	everywhere	všude	mindenki	dare-mo	shénme dōu
NPI/FCI	anywhere	kdekoli	akárki	dare-mo	shénme
NEG/NCI	nowhere	nikde	senki	dare-mo	shénme
...		kdesi			

**Table:** Interrogative pronouns → Indefinite pronouns

Haspelmath 1997; Ramchand 1997; Hagstrom 1998; Kratzer & Shimoyama 2002; Chierchia 2013; Szabolcsi 2015, 2018

## Motivation: int → rel

But we know little about how how **interrogative pronouns** give rise to **relative pronouns**.

	English where	Czech where	Hungarian who	Greek who/which	Slovenian where	Hindi who
Q	where	kde	ki	pjos	kje	kis
R	where	kde	aki	opjos	kjer	jis
FCI	anywhere	kdekoli	akárki	opjosdhípote	kjerkoli	jis bhii

Table: Interrogative pronouns → Relative pronouns

Dayal 1997; Giannakidou & Cheng 2006; Rudin 2009; Franks & Rudin 2015

# Aims for this talk

## Aims

- Demonstrate what interrogative/relative pronoun morphology suggests about the relation among individual relative constructions.
- Provide a **general framework** for analyzing the patterns.
- Data: mainly typological generalizations.
- Only limited space for exploring particular predictions and analyses of particular phenomena.

Motivation and aim

**Constructions**

Morphology

Syntax–semantics



# Constructions to be considered

- **Interrogatives (Q)**
  - Mainly matrix
  - Embedding not considered here (sometimes on a par with FR/HR)
- **Unconditionals (UnC)**
  - Conditional-like structures with ever-morphemes
  - Wh-referent optionally picked up in the consequent
- **Correlatives (CoR)**
  - Conditional-like structures without ever-morphemes
  - Wh-referent obligatorily picked up in the consequent
- **Free relatives (FR)**
  - Wh-clauses used as NPs or PPs
  - Functionally very close to light-headed relatives Citko 2004
- **Headed relatives (HR)**
  - Relatives headed by NPs
- A note on other constructions

## Interrogatives (Q)

Matrix interrogative:

- (2) János **kit** mutatott be Marinak? *Hu*  
 János who.ACC introduced PRT Mary.to  
 ‘Who did János introduce to Mari?’

Embedded interrogative sometimes take the shape of interrogatives (3), other times of (free) relatives, (4).

- (3) János azt kérdezte, hogy Péter **melyik** egyetemre készül. *Hu*  
 János that.ACC asked COMP Péter which university.to applies  
 ‘János asked to which university Péter would apply.’

- (4) a. No sé **lo que** te gusta. *Sp*  
 NEG know.1SG REL what you taste.3SG  
 ‘I don’t know what you like.’
- b. Kwadwo ka-a **nipa ko aa** ɔ-kɔ-ɔ Kumase kyerε-ε Adwoa.  
 Kwadwo tell-PST person one REL 3SG-go-PST Kumasi who-PST Adwoa  
 ‘Kwadwo told Adwoa who went to Kumasi.’ *Akan*

Embedded interrogatives are a mixed bag → set aside here.

# Unconditionals (UnC)

Constituent unconditionals are accompanied by the ever-morpheme; the wh-referent need not be picked up in the consequent.

- (5) a. **Whoever** goes to the party, it will be fun.  
 b. **Whoever<sub>i</sub>** goes to the party, they<sub>i</sub>'ll be surprised.

They are sometimes formed using interrogative pronouns. . .

- (6) {**Akárki** / \***Akáraki**} telefonált, elbeszélgettünk. *Hu*  
 EVER.who EVER.REL.who called chatted.1PL  
 'Whoever called, we chatted.'

and other times using relative pronouns.

- (7) a. {**Kdor**koli / \***Kdo**koli} (že) pride, bom zadovoljen. *Sl*  
 who.REL.EVER who.EVER PRT come.3SG will.be.1SG satisfied.  
 'Whoever comes, I'll be happy.'  
 b. Naj pride {**kdor** / \***kdo**} (že) pride, bom zadovoljen.  
 PRT come.3SG who.REL who PRT come.3SG will.be.1SG satisfied  
 'Whoever comes, I'll be happy.'

## Correlatives (CoR)

Correlatives have no ever-morpheme and require that the *wh*-referent be picked up in the consequent, typically by a demonstrative.

- (8) **jo** laRkii khaRii hai **vo** lambii hai. *Hindi*  
 REL.DET girl standing is DEM.DET tall is  
 ‘The girl who is standing is tall.’

Correlatives make use of rel-pronouns (if existent in the language); int-pronouns are allowed only exceptionally (Hungarian: proverbs):

- (9) a. {**Aki<sub>i</sub>** / **Ki<sub>i</sub>**} másnak vermet ás, **maga<sub>i</sub>** esik bele. *Hu*  
 REL.who who other.DAT pit.ACC digs himself falls in.it  
 ‘Who digs a pit for someone else, falls in it himself.’
- b. {**Aki<sub>i</sub>** / \***Ki<sub>i</sub>**} megette a tortát, **azt<sub>i</sub>** megbüntetjük.  
 REL.who who eat.PST.3SG the cake.ACC that.ACC punish.1PL  
 ‘Who has eaten the cake, that we will punish.’

## Free relatives (FR)

Free relatives are well-known and well-studied constructions. They come in two varieties, with important morphosyntactic and semantic differences – plain vs. ever FRs (here mostly set aside).

- (10) a. I ate **what(ever)** Dave cooked.  
 b. Ich esse, **was** (**auch immer**) David kocht. Ge  
 I eat.1SG what EVER David cooks  
 'I (will) eat what(ever) David cooks.'

Languages which use relative morphology in correlatives, also use it in free relatives, independently of the plain vs. ever contrast:

- (11) Meghívtam {**akit** **csak** / **\*akárki**} láttam. Hu  
 invited.1SG REL.who.ACC only EVER.who saw.1SG  
 'I invited whoever I saw.'

Closely related are **light-headed relatives** (set aside here), which (i) makes use of the same wh-words but (ii) rule out the use of ever-morphemes.

- (12) Jan śpiewa to, **co** (**\*-kolwiek**) Maria śpiewa. Po  
 Jan sings that what -EVER Maria sings  
 'Jan sings what Mary sings.'

# Headed relatives (HR)

Standard relatives headed by a nominal:

- (13) a. the city **which** I visited  
b. the city **where** I was born  
c. a man **who** I didn't recognize

# A note on other constructions

## Non-wh-relatives

- There are many different relativization strategies across languages (see de Vries 2002; Cinque 2020).
- Using wh-words is just one option, one that possibly comes with consequences (at least in headed relatives).
- Using wh-words for relativization turns out to be a fairly complex – perhaps even unnecessarily complex – process, which could explain why they are so rare cross-linguistically.

## Internally headed relatives

Hiraiwa 2017

- There is no documented case of wh-in-situ in embedded relative clauses and hence also no wh-internal heads.

## Modal existential constructions

- Generally use interrogative forms (exception: Hungarian optionally uses relative forms).
- A possible analysis mentioned later.

Ambitious attempt at a unification, though with many parameters to be set, yielding various different relativization strategies: Cinque 2020





# Cross-linguistic and cross-constructional paradigm

	English where	German what	Turkish who	Hungarian who	Bulgarian who	Hindi where	Greek who	Abaza REL. ABS
Q	where	was	kim	ki	koj	kidhar	pjos	j(ə)-
UnC	where+	was+	kim	ki+	koj(to)+	j/kidhar+	opjos+	j(ə)-
CoR		was	kim	(a)ki	kojto	jidhar	opjos	
FR	where	was	χ	aki	kojto	jidhar	opjos	j(ə)-
HR	where	das	χ	aki	kojto	jidhar	o opíos	j(ə)-

**Table:** Morphology of interrogative and (cor)relative pronouns

- R-morpheme either affixed on the wh-word (e.g. Bulgarian) or “replacing” the wh-morpheme (Hindi).
- Implicational hierarchy: If R-morpheme surfaces on a pronoun in some construction, it also surfaces on the pronoun in the “lower” construction.
- Gap (potential ABA?): English or Abaza CoR.
- + stands for obligatory additional morphology (e.g. ever-morpheme)

Pancheva Izvorski 2000; É. Kiss 2002; Bhatt 2011; Fuß & Grewendorf 2014; Demirok 2017; Daskalaki to appear; Bacskai-Atkari & Dékány to appear; Arkadiev & Caponigro to appear

# Cross-linguistic and cross-constructional paradigm

## The case of Syrian Arabic

	Syrian Arabic			
	what	who	where	when
Q	šu	mīn	wēn	aymat
UnC	šuma	mīnma	wēnma	aymatma
CoR	šu(ma)	mīnma	wēn	lamma
FR	šu	illi+RES	mahallma	lamma
HR	illi+RES	illi+RES	mahallma	illi+RES

**Table:** Interrogative and (cor)relative constructions in Syrian Arabic

- The hierarchy is defined not based on language, but based on particular *wh*-items.
- Syrian also demonstrates the existence of suppletion: *wēn* ‘where’ (Q/CoR) – *mahall* ‘place’ (FR/HR).
- The *ma* morpheme in Syrian Arabic is still to be explored; being highly polysemous/polyfunctional, it might be ambivalent between the ever morpheme (obligatory in unconditionals) and a relativizer (*mahallma* ≈ place.REL).
- Cf. English *what* (✗HR) vs. *who* (✓HR).

# Nanosyntax of relative pronouns

- Labels adopted from the clausal spine; cross-categorial fseq
- NP provides nominal restriction ( $\phi$ -features, PLACE, TIME, etc.)
- Foc ( $\approx$  Wh) turns the core indefinite to focus
- Top turns the focus to a topical referent
- Force ( $\approx$  Rel) encodes embedding (relation to CP-external D)
- The functional heads operate quasi-compositionally: not on metalanguage but on referential indices.
- HRs left aside. . .

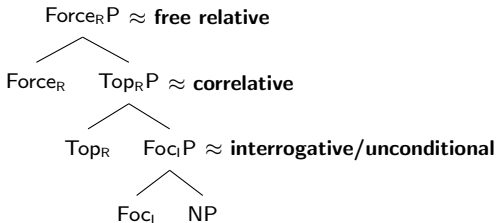
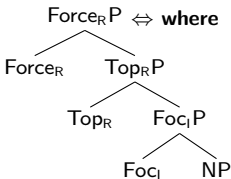


Figure: Structure of interrogative/(cor)relative pronouns

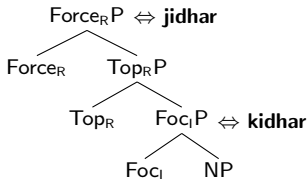
# Nanosyntactic lexical entries and spellout

- The usual nanosyntactic spellout principles apply (phrasal spellout, superset, elsewhere; Starke 2009)
- Precise technical implementation left aside

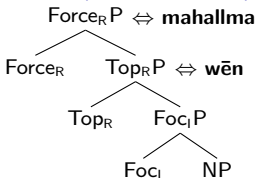
## English (German, Czech)



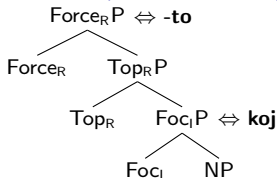
## Hindi



## Syrian (Turkish, Chinese)



## Bulgarian (Hungarian, Greek)



## Diachronic evidence

At least some diachronic evidence suggests that free and headed relative *wh*-based pronouns do not develop directly from interrogative ones, but via unconditional and then correlative ones.

- Mitrenina (2012): The case of Russian *kotoryj* ‘which’: interrogative → “pseudo-correlative” (between unconditional and correlative) → relative; replaced by *kakoj* in the interrogative function
- Belyaev & Haug (2014): Discussion of multiple Indo-European languages; indefinite in conditionals → correlative → relative.
- Gisborne & Truswell (2018): English

There are also accounts that assume a “direct” interrogative → free/light-headed relative → headed relative development.

- Heine & Kuteva (2006): embedded interrogative → free relative → headed relative
- Bacskai-Atkari & Dékány (to appear): Hungarian *az NP* ‘that NP’ → *az ki* ‘that who’ → *aki* ‘REL.who’

Motivation and aim

Constructions

Morphology

**Syntax–semantics**

## Background theory: int $\rightarrow$ ind

- Wh-indeterminates are non-quantificational restricted variables (here and elsewhere: focus variables).
- Wh-affixes/morphemes indicate a relation, possibly long-distance, with a higher propositional quantifier, possibly more of them.

- (14) a. [Q] ... **where** ...  
 b. [∃] ... **somewhere** ...  
 c. [∀] ... EXH ... **wherever/anywhere** ...  
 d.  $\neg$ [∃] ... **nowhere** ...

- The theory could be combined with a choice-functional approach to wh-based indeterminates. Yanovich 2005; Cable 2010

Beghelli & Stowell 1997; Kratzer & Shimoyama 2002; Aloni 2003, 2007; Butler 2004; Zeijlstra 2004; Beck 2006 (often different technical implementations)

Related: wh-indefinites are existential quantifiers associated with exhaustification over propositional alternatives (Chierchia 2013; Szabolcsi 2019; Fălăuş & Nicolae 2020)

## Application to (cor)relatives

Building on the insights from the int → ind theory, illustrated here in (15-a,b), I propose a similar account of (cor)relative pronouns, where the functional heads (Top, Force) are in a relationship with a c-commanding quantificational head, either propositional (CoR-Op) or determiner (Det).

(15) a. **Questions**

Beck 2006

[Q] ... [<sub>FocP</sub> **where**] ...

b. **Unconditionals**

Rawlins 2013

[V] Cond-Op [<sub>A</sub> [Q<sub>EXH</sub>] [<sub>FocP</sub> **wher**]ever ...] [<sub>C</sub> ...]

c. **Correlatives**

CoR-Op [<sub>A</sub> ... [<sub>TopP</sub> **aki**] ...] [<sub>C</sub> ... [<sub>DemP</sub> **az**] ...]

d. **(Free) relatives**

Det [<sub>ForceP</sub> **aki** ...]



## Interrogative pronoun

- The NP (here PLACE) is Heim’s (1982) indefinite (restricted variable).
- $Foc_i$  turns an ordinary index to a focus index, interpreted by the designated assignment  $h$ ; it is like the standard F-marker, but gets rid of the ordinary meaning (a “subcompositional” process).
- The resulting meaning is identical to the one proposed by Beck (2006) for interrogative wh-words, which builds on Kratzer’s (1991) and Wold’s (1996) theory of focus interpretation; the meaning is the focus value; ordinary value is undefined.

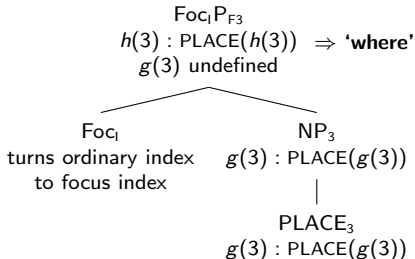
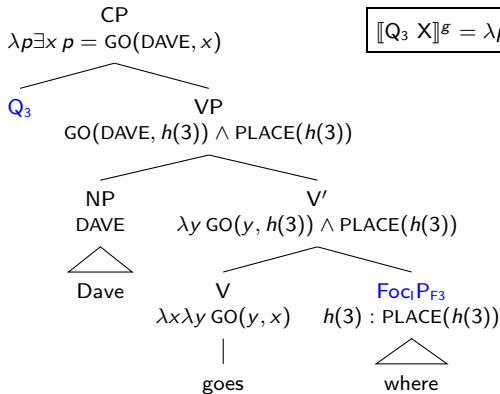


Figure: Representation of the interrogative pronoun

# Interrogative clause



$$\llbracket Q_3 X \rrbracket^g = \lambda p \exists x p = \llbracket X \rrbracket^{g, h[3 \rightarrow x]} \quad (\text{Beck 2006})$$

Figure: Representation of the interrogative clause



# Correlative construction

$\llbracket \text{Cond-Op } A \text{ B} \rrbracket^g = \forall w \llbracket A \rrbracket(w) \rightarrow \llbracket B \rrbracket(w)$  (Kratzer 2012; simplified)

$\llbracket \text{CoR-Op}_3 \text{ A B} \rrbracket^g = \forall w, x \llbracket A \rrbracket^{g[3 \rightarrow x]}(w) \rightarrow \llbracket B \rrbracket^{g[3 \rightarrow x]}(w)$  (proposal)

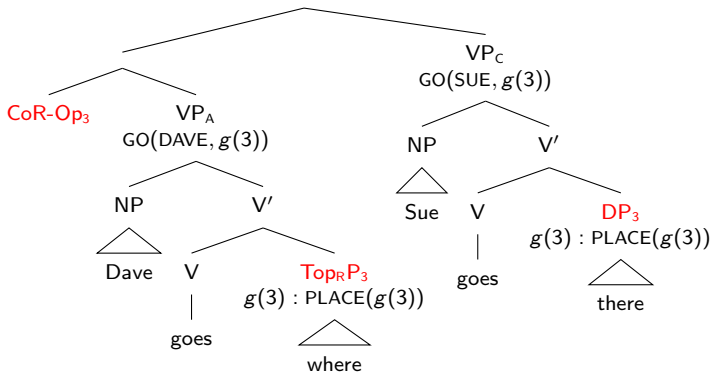


Figure: Representation of the correlative construction

# Correlatives: Discussion

## CoR-Op

- Just like with Cond-Op, the semantic nature of CoR-Op determines the type of correlative (generic, modal, extensional). Declerck & Reed 2001; Haegeman 2003
- Languages can differ in which operators can be “adapted” (from conditional) to correlative use, with generic ones being the most likely ones (= **puzzle**, to me).

## In-situ vs. ex-situ

- Correlative pronouns can in principle be **in-situ** (Hindi, Turkish, Chinese) or **ex-situ** (most European languages).
- My proposal relies on in-situ semantics (binding) of correlative pronouns. Correspondingly, correlative antecedents/consequents have propositional semantics (like questions or conditionals). Bittner 2001; Brasoveanu 2008
- Cf. in-situ semantics for in-situ correlatives (Liu 2016; Demirok 2017); ex-situ semantics for in-situ correlatives (Srivastav 1991; Chen 2019).



## Correlatives: Discussion

### Correlative/“Interrogative” mix

- Rudin (2009) shows that the presence/absence of *-to* on *wh*-words in Bulgarian multiple-*wh* correlatives correlates with interpretation; cf. (17).
- In the present analysis, correlative *wh*-words (with *-to*) get bound by CoR-Op, while non-correlative (without *-to*) don't. The latter are interpreted as *wh*-words in unconditionals. (Logical representations are simplified.)

- (17) a. **Kogoto kakvoto** go boli, za nego prikazva. *Bg*  
 who.REL what.REL him hurts about it talks  
 'The person who has something hurting, talks about it.'  
 $\forall w, x, y[\text{HURT}(x, y, w) \rightarrow \text{TALK ABOUT}(x, y, w)]$
- b. **Kogo kakvoto** go boli, za nego prikazva.  
 who what.REL him hurts about it talks  
 'Everyone talks about whatever is hurting them.'  
 $\forall x[\text{PERSON}(x) \rightarrow \forall w, y[\text{HURT}(x, y, w) \rightarrow \text{TALK ABOUT}(x, y, w)]]$

# Free relative pronoun

- Force is selected for (Rizzi 1997) → in-situ interpretation impossible.
- Selection by a nominal determiner entails selection of a property → **lambda-abstraction** is necessary.
- The free relative pronoun ForceP moves to the left periphery where it is interpreted as a lambda abstractor, contributing the nominal restriction (Heim & Kratzer 1998; Adger & Ramchand 2005). Besides the restriction, the node does not contribute its own meaning, it only contributes to the meaning of its mother.

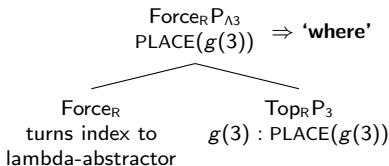


Figure: Representation of the free relative pronoun



# Free relative clause

- I assume that the relative pronoun projects (cf. Donati & Cecchetto 2011).
- Alternatively, Force<sub>R</sub> is base-generated in the left periphery and Top<sub>R</sub> moves into its complement (submerge; Pesetsky 2013; multidominance version with Top<sub>R</sub>P “in-situ”: Johnson 2012)

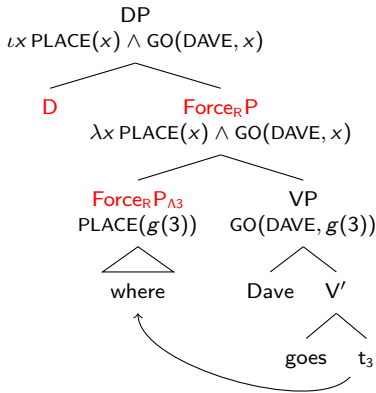


Figure: Representation of the free relative clause

# Free relatives: Discussion

## No relative wh-in-situ

- There is no wh-in-situ in free (or headed) relatives (originally discussed by Schwartz 1971; cf. de Vries 2005).
- What comes closest to an exception: Tsez ever free relatives (Polinsky 2015); Hittite headed relatives (Huggard 2015).

## Light-headed relatives

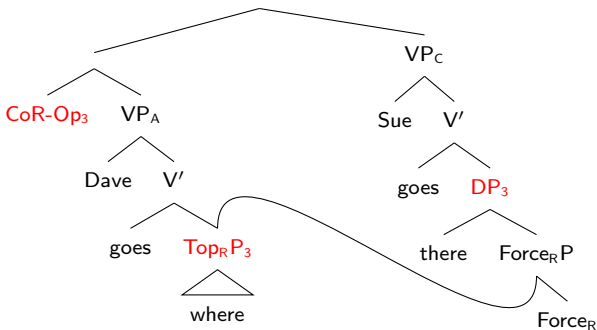
- The analysis is directly applicable to light-headed relatives (Citko 2004). That is a good result, as it is very rare for light-headed relative pronouns to be different from free relative pronouns (potential exception: English, which seems to use headed relative pronouns – still in line with the implicational hierarchy above).

- (18) a. Pozval {toho / každého / někoho}, koho včera potkal. Cz  
 invited.PFV.SG.M that everybody somebody who yesterday met.PFV.SG.M  
 'He invited {that / every / some} person that he met yesterday.'
- b. ... [VP invited [DP [D that / everybody / somebody] [Force<sub>RP</sub> [Force<sub>RP</sub> who] he met]]]

# Free relatives: Discussion

## Connection to correlatives

- Diachronic link between correlatives and free/light-headed relatives (see above).
- Synchronically, not always easy to tell the two apart (in some cases: correlatives ≈ left-dislocated free relatives).
- Present take on the synchrony, multi-dominance-style:



## Headed relatives: Discussion

- Wh-words in headed relatives is the rarest phenomenon cross-linguistically.
- They are **determiners**, not pronouns.
- The dependency expressed by headed relative pronouns is not between a quantificational head (D, Op, etc.) and a pronoun, but between two NPs: the RC-internal and RC-external head (on the so-called matching analysis).

(19) the **book** [CP [**which** ~~book~~] I read]

- Yet they also must trigger abstraction (property of Force<sub>R</sub>)  
→ **double function** of the headed relative pronoun.
- The double function can map to **morphological complexity**; cf. Greek FR *opjos*  
– HR *o opíos*.
- **Note:** Raising relatives do not use relative pronouns (Aoun & Li 2003; Szczegielniak 2005; Cinque 2020) (= no non-movement dependency involved).

(20) the book<sub>1</sub> [CP t<sub>1</sub> (that) I read t<sub>1</sub>]

## Unconditionals: Discussion

- In the present analysis, unconditional *wh*-words are not (cor)relative (ForceP/TopP), but interrogative (FocP).
- **Puzzle:** Some languages use free relative pronouns in unconditionals: Slovenian *kdorkoli* 'who.REL.EVER', Greek *opjodhípote* 'REL.who.EVER'.
- **Potential solution:** These *wh*-words are sluicing remnants of free relatives.

(21) Comes [<sub>FR</sub> who(ever) ~~comes~~], you'll be happy.

- **Evidence from Slovenian doubling unconditionals:**

(22) a. Naj pride [<sub>FR</sub> **kdor** (-koli) (že) pride], bom  
 PRT come.3SG who.REL -EVER PRT come.3SG will.be.1SG  
 zadovoljen.  
 satisfied

'Whoever comes, I'll be happy.'

b. Naj pride [<sub>FR</sub> **kdorkoli** (že) ~~pride~~], bom  
 PRT come.3SG who.REL.EVER PRT come.3SG will.be.1SG  
 zadovoljen.  
 satisfied

'Whoever comes, I'll be happy.'

Šimík 2020

# Modal existential constructions: Discussion

**Puzzle:** Wh-words in MECs exhibit apparently conflicting properties:

- They wh-move obligatorily (trigger lambda-abstraction) and yet
- they have no relative morphemes (potential exception: Hungarian).

- (23) a. Nimam [MEC s {čime / \*čimer} pomiti posodo]. *SIn*  
 NEG.have.1SG with what what.REL wash.INF dishes  
 'I have nothing to clean the dishes with.'
- b. \*Nimam [MEC pomiti posodo s čime]. *SIn*  
 NEG.have.1SG wash.INF dishes with what  
 Intended: 'I have nothing to clean the dishes with.' ?

**Potential solution:**

- Their “licensing” operator is not of the right kind to license Top/Force projections.
- They are FocPs turned directly to a  $\Lambda$ -index (triggering lambda-abstraction).

## Summary

- Relative pronouns are not just sometimes identical to interrogative ones, they can be **morphologically derived** from them (int → rel).
- This process is similar to the more common derivation of indefinites from interrogative pronouns (int → ind).
- I proposed that relative pronouns, just like indefinite ones, may be in need of **licensing from a higher quantificational operator**. In correlatives, this operator is akin to Kratzerian conditional modal; in free (and light-headed) relatives, this operator is a definite or quantificational determiner.
- Morphological evidence suggests the following structural containment:

(24) Free relative pronoun  $\supset$  Correlative pronoun  $\supset$  Interrogative pronoun

- I proposed account for the morphological containment in a nanosyntactic fashion, building on the familiar hierarchy Force > Top > Foc.

# Summary

THANK YOU!

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