

Issues in wh-syntax and semantics

Radek Šimík
University of Potsdam, SFB 632
simik@uni-potsdam.de

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Lecture 1

Introduction

1.1 Background assumptions

- **Minimalism** Syntax is simply merge, the recursive procedure creating complex structured expressions out of atomic non-structured ones.
- **Syntactic categories/features/fseq** The elements that syntax operates on. The only “substantive” residue in syntax.
- **Extra-syntactic factors** The way grammar is designed dwells only partly on syntax; a lot of grammatical properties are to be attributed to extra-syntactic factors, such as interface conditions (semantic and phonological), and even extra-linguistic factors (so called “third” factors; cf. Chomsky 2005).
- **Features as descriptive devices** Features in syntax ([EPP], [\pm wh], [\pm strong] etc.) are just descriptive devices, or convenient shortcuts for “deeper”, perhaps yet undiscovered properties of grammar. Cf. Richards’ (2010) recent attempt to eliminate feature strength in the wh-domain and to account for the wh-movement/in-situ parameter by interface conditions.

1.2 Structure and goals of the class

- Words and syntax-free words; some examples: *only*, stress, wh, Q-particles
- Background on the syntax and semantics of wh
- The wh/CP conjecture and an argument against it from modal existential wh-constructions
- Wh-words, fseq, and wh-construction-selecting operators
- Modal existential wh-constructions, the existence state, covert modality

1.3 On lexical items (“words”)

1.3.1 Background

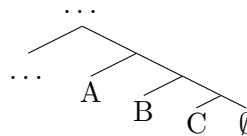
- Lexicon is not an independent linguistic module (Starke). It is just a dumb repository.
 - Lexicon is a set of ordered tuples—lexical items (or simply “words”).

- There are no “lexical operations” (e.g. morphology).
- Standard picture: a word is an ordered **triple**
 - (1) ⟨concept/meaning, phonological matrix, syntactic features⟩
- Also permissible are two types of ordered **pairs**—words with no phonology (e.g. PRO) or no meaning (e.g. expletives):
 - (2) a. ⟨concept/meaning, syntactic features⟩, e.g. PRO, or empty operators
 - b. ⟨syntactic features, phonological matrix⟩, e.g. *there* or *it*
- But how about the fourth logical possibility, namely words with no syntax in them?

1.3.2 Controversy

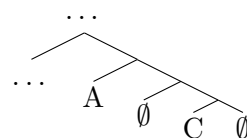
- Do words have to be specified for syntactic information?
 - **No:** most prominently the distributed morphology bunch (for an explicit discussion see Marantz 1995; Borer 2005b; van Craenenbroeck and De Belder 2011)
 - Roots have no syntactic properties at all. Effectively, roots are ordered pairs:
 - (3) ⟨concept/meaning, phonological matrix⟩
 - **Yes:** classical minimalism (Chomsky), nanosyntax (see Ramchand 2008 for discussion)
 - Roots do have syntactic properties—they are associated with syntactic skeletons encoding event and argument structure.
- Implicit assumption of most of those who answer negatively
 - (4) The only “words” that have no syntax are roots
- van Craenenbroeck and De Belder (2011) provide a rationale for this apparent stipulation—roots are inserted initial derivational nodes (the empty set; cf. Zwart 2009, 2011); all other nodes have some syntactic category

(5)



- But what prevents trees like the following?

(6)



- The hypothesis space: Must words be specified for syntactic information?

1. syntax is omnipresent (minimalism, nanosyntax)
2. syntax is omnipresent, except for roots/initial nodes (DM; van Craenenbroeck and De Belder 2011)
3. there is no ban on syntax-free words

1.4 Functional syntax-free words

How do we detect the lack of syntax in words?

- The lack of what are standardly treated as grammatical properties, e.g. grammatical voice, argument structure, count vs. mass, etc.
- (7) Examples from van Craenenbroeck and De Belder (2011) (but see mainly Borer 2005a for a detailed discussion)
- a. I've got a stone in my hand.
 - b. There's too much stone and metal in this room.
 - c. They went to stone this man.
 - d. Billy-Bob should lay off the weed; he's always stoned.¹

Any precedents to expect functional categories or operations to be syntax-free?

- Parallelisms between categories—V, A, N possibly all share functional structure. This structure appears in the left periphery (Thomas Leu, Abney 1987, Szabolcsi 1994).
- Syntactic movements for the sake of lexicalization: also an interface-motivated approach (Caha 2009; Starke 2011).

Some cases:

1. Contrastive stress in English (and other European languages)
2. *Only* in English
3. Q-particles and wh-morphemes

1.4.1 Contrastive stress (in English)

- **Hypothesis:** CONTRAST is a function “word” with a conventional pairing of phonological and semantic properties and yet, it appears to have no syntactic properties.
- Contrastive stress has **no selectional properties**, whether c-selectional or s-selectional; it can associate with NPs/predicates (8a), Ds/determiners, (8b), Vs/two-place predicates, (8c), DPs/proper names, (8d). Moreover, (8a) is compatible with a reading where it selects the whole DP/definite description (*that tomato*), the whole VP/one-place predicate/event predicate (*ate that tomato*), or even the whole TP/CP/proposition (*Mary ate that tomato*).

- (8) a. Mary ate that TOMATO.

¹van Craenenbroeck and De Belder (2011) must be silently assuming that general cognitive concept of ‘stone’ is somehow present in the state of being stoned, presumably by metaphoric means.

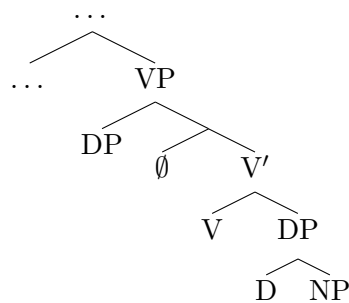
- b. Mary ate THAT tomato.
- c. Mary ATE that tomato.
- d. MARY ate that tomato.

- So, suppose CONTRAST has the following \langle phonology, semantics \rangle specification

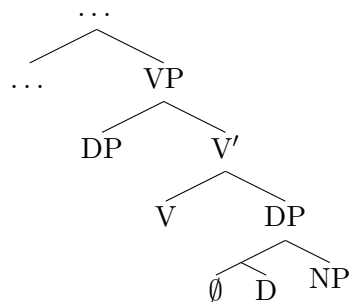
- (9) CONTRAST = \langle stress the complement, $\lambda x_\sigma.x^i$ \rangle ,
 where σ is any type and the i -superscript is a distinguished variable in the sense of Kratzer (1991)²

- A syntactic treatment: A syntax-free word is merged anywhere during the syntactic derivation;
 cf. the following two examples:

- (10) a.



- b.



- At lexical insertion, CONTRAST is inserted to \emptyset ; this gives us the following phonology and semantics for (10a) and (10b), respectively.³

- (11) a. *phonology*
 Mary ate that TOMATO.
 b. *semantics*
 $\text{ate}(f_C(\mathbb{T}), m) \bullet \{p : p = P(m) \mid P \in D_{\langle e,t \rangle}\}$
 $= \{\text{read}(\text{a.book}, m), \text{sleep}(m), \dots\}$

- (12) a. *phonology*
 Mary ate THAT tomato.

²This is actually not quite correct. The semantic contribution of CONTRAST is simply an index, I'll come back to this later.

³For simplicity and empirical accuracy, I treat the determiner *that* as a contextually salient choice function f_C ; see e.g. von Stechow (2000) for a generalized choice-function approach to determiners and Sauerland (1998b) for some criticism. The bullet (\bullet) divides ordinary meaning from focus-semantic meaning (Rooth 1985).

- b. *semantics*
 $\text{ate}(f_C(\mathbf{T}), \mathbf{m}) \bullet \{p : p = \text{ate}(f(\mathbf{T}), \mathbf{m}) \mid f \in D_{\langle et, e \rangle}\}$
 $= \{\text{ate}(\text{that}_1.\text{tomato}, \mathbf{m}), \text{ate}(\text{that}_2.\text{tomato}, \mathbf{m}), \dots\}$

- **Subword contrast** also exists (see mainly Artstein 2002), though it is typically metalinguistic—it does not directly manipulate denotations, but other aspects of linguistic expressions (Krifka 2007).

(13) I gave her a comPLIment [not comPLEment].

- Yet, to the extent that subword contrast shares the (phonological and semantic) properties of constituent contrast, it also provides a strong support for a syntax-free treatment of CONTRAST.

1.4.2 *Only* (in English)

- Consider the behavior of English *only*; see also Herburger (2000: Chapter 4)

- (14)
- Laura is the **only** [NP linguist] in town.
 - Laura reads **only** [DP books about linguistics].
 - Laura speaks **only** [PP with linguists].
 - Laura **only** [VP speaks with linguists].
 - Laura is **only** [AdvP partly] satisfied.
 - People are pretty much alike. It's **only** [CP that our differences are more susceptible to definition than our similarities].

- In all these cases, *only* has a fairly unified semantics (uncontroversial for (14b-d), perhaps less so for (14a) and (14e)), namely the *exclusion of relevant alternatives*. Needless to say, it also has a unified phonological matrix: /əʊnli/.

- So, possibly, *only* has the following ⟨phonology, semantics⟩ specification.

(15) $\text{only} = \langle /əʊnli/, \text{exclusion of alternatives} \rangle$

- Yet, it is also possible that *only* only marks the presence of alternatives (similarly to CONTRAST) plus the dependency on a covert propositional exclusive operator.

- **C-command** It's often been suggested that *only* must c-command the constituent that it associates with.⁴

(16) Laura has only studied LINGUISTICS.
 \rightarrow Laura hasn't studied anything else than linguistics.

(17) LAURA has only studied linguistics.
 $\overset{?}{\rightarrow}$ Nobody else than Laura has studied linguistics.

⁴See e.g. Aoun and Li (1993) and especially Beaver and Clark (2008) for a recent summary of the arguments and relevant references.

- There's little doubt that this c-command condition applies at LF (essentially, it's a binding relation). But then, why is the first inference in (18) ruled out? Notice that *himself* must reconstruct at LF for independent reasons—anaphor binding by *John*. Once it is there, it is in the scope of *only*, so why cannot it associate with it?⁵

- (18) [Whose portrait of HIMSELF_{*i*}]₁ did John_{*i*} only like t₁.
- ↔ Which *x*, *x* a painter, is such that John only liked *x*'s portrait of HIMSELF (and not of anybody else).
 - Which *x*, *x* a painter, is such that John only LIKED (and not e.g. loved) *x*'s portrait of himself.

- The question is whether this is due to the behavior of *only* or due to CONTRAST, e.g. CONTRAST cannot reconstruct. Some PF relation between the two must apparently be involved.

1.4.3 Wh-morphemes and Q-particles

The categorial freedom of wh-stems

- The wh-morpheme is likewise a hot candidate on a word with no syntax; the following examples illustrate its morphosyntactic promiscuity:

- (19) a. **wh** [D/N o]
 b. **wh** [D/N at]⁶
 c. **h** [Adv ow]
 d. **wh** [Adv en]
 e. **wh** [Adj ich]
 f. **wh** [CP/TP y]⁷
 g. **wh** [Conj(P) ether]

- (19a) through (19d) seem intuitively clear.
- (19a) and (19b): There's been some discussion concerning whether *(wh)o*/*(wh)at* are noun-like or determiner-like (or in the determiner *what* (as in *what kind of*) even adjectival like; cf. Leu 2008b; 2008a), with the latter position being much more popular.
- (19c): Some languages have more *(h)ows*, possibly corresponding to various types of adverbs (state-modifier, result-modifier, process-modifier, etc.); in some languages, *(h)ow* appears to have a rich internal structure; see e.g. Tsai (1999); Vangsnes (2006, 2008) for a very interesting discussion.

⁵Association with extracted material is apparently possible in German; see Jacobs (1983); Buring and Hartmann (2001).

⁶To the extent that *what* is the elsewhere form in interrogatives (VP: *What did you do?* CP: *What did he say?*), *-at* might also correspond to CP or TP. Krifka (2011) reports that Kiribati (Austronesian) has specialized wh-proforms for VPs: 'do what', 'do where', 'do how'. See also fn. 7.

⁷In most languages known to me, *why* is derived from *what* and *what* arguably functions as an elsewhere interrogative wh. See also fn. 6.

- (19e) is likely, given cross-linguistic comparison, which tells us that *-ich* is (historically) related to *-like*—cf. German *welch-* which basically is [w+lich], where *-lich* is a morpheme of Adj-category in German (*Unterschied* ‘difference’ – *unterschiedlich* ‘different’), just like the English *-like* (*elephant-like*); See Leu (2008a), who cites Pfeifer (2003).
- (19f) becomes clear when one realizes that *why* has a propositional semantics (at least on one of its readings—the causal one).
- (19g), the morphological relation between *-ether* and *either* seems clear and justified also by syntax and semantics (see Guerzoni 2003 and Han and Romero 2004, among others, and Beck and Kim 2006 for some criticism).

The selectional freedom of Q-particles

- Placement of Q-particles seems to be governed by interpretability.
- Hagstrom (1998); Kishimoto (2005); Cable (2007): Japanese, Sinhala, Tlingit
- Q-particles form chains with “wh-words” (generic stems) in questions, (free) relatives, and indefinites. They must c-command wh-words and wh-words must be c-commanded by them.
- They are similarly free as wh-words with respect to the category they attach to (data from Cable 2007, Tlingit):

- (20)
- Daa** **sá** aawaxáa i éesh?
what Q he.ate.it your father
‘What did your father eat?’
 - [**Daat** tlein] **sáwé** tsú wéix yaa nagút.
what big Q.foc-part too there.at it.is.walking
‘There was something large walking along over there.’
 - [**Aadóo** jeet] **sá** wé sakwnéin aawatee?
who hand.to Q that bread he.brought.it
‘Who did he give the bread to?’
 - [_{CP} **Goodéi** woogootx] **sá** has uwajée i shagóonich?
where.to he.went Q they.think your parents.erg
‘Where do your parents think that he went?’
 - [NP [_{CP} **Wáa** yateeyí] sháx’sáani] **sá** ash kudlénxaa?
how they.are.REL girls Q they.are.tempting.him
 - *[NP [_{CP} **Wáa** **sá** yateeyí] sháx’sáani] ash kudlénxaa?
how Q they.are.REL girls they.are.tempting.him
‘What kind of girls are tempting him?’

- Q-particles: Base-generation vs. “Q-migration”?
 - Hagstrom (1998): *Q-migration*: Q is always generated as the sister of a wh-phrase and subsequently moves at the edge of an island; this movement, if necessary, is nothing like we’re used to in syntax; under Hagstrom’s account, it leaves no trace (under Hagstrom’s account), it is island-insensitive (it is *designed* to move outside of islands), it has flexible targets (NP-islands, adverbial islands), etc.⁸

⁸The objects to whose creation Q-migration leads are much like what Krifka (2006) terms “focus phrases”, i.e. islands containing semantic focus.

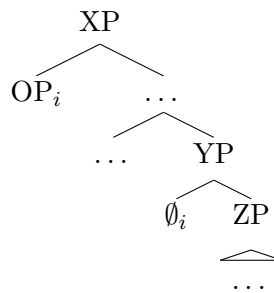
– Šimík (2010b): *Base-generation*: Q is base-generated; the base-generation is not governed by grammatical principles but rather by focus; and focus-marking might very well be “syntax-free”, as we saw above

- Both of these options apparently require some deal of “syntax-freeness”.

1.4.4 A generalization?

- What do all the above “words”, i.e. CONTRAST, *only*, *wh*, and Q-particles have in common?
- They all introduce alternatives and possibly mark a dependency on some higher operators. This dependency can be more or less specific; maybe completely missing with CONTRAST, being fairly underspecified with *wh* and Q-particles, and being quite specific (association with EXH) in case of *only*.

(21)



1.4.5 A note on adjuncts and bound morphemes

- The above cases could be seen as cases of true adjunction—blind to any selectional properties.
- Much of what is typically treated as adjuncts display strict selectional/syntactic restrictions.

- (22)
- a. State/process/accomplishment modifiers
 - b. Aspectual modifiers
 - c. etc.

Lecture 2

Freedom of wh-movement: An argument from modal existential wh-constructions

2.1 Introduction

2.1.1 The wh/CP conjecture

Modal existential wh-constructions vs. embedded questions

- Consider the following minimal pair—an embedded questions in (1a) and a modal existential wh-construction in (1b).

- (1) a. **Nevím** [EQ komu zavolat].
NEG:know:1SG who:DAT call:INF
'I don't know who to call.'
- b. **Nemám** [MEC komu zavolat].
NEG:have:1SG who:DAT call:INF
'There's nobody who I could call.'

- The standard response is that the surface parallelism between (1a) and (1b) maps to a structural parallelism, i.e. the claim is that *both embedded questions and modal existential wh-constructions are CPs*.¹

- (2) a. ...[VP **know** [CP who₁ [TP PRO call t₁]]]
b. ...[VP **have** [CP who₁ [TP PRO call t₁]]]

- We can call this assumption the wh/CP conjecture

- (3) *The wh/CP conjecture*
Wh-movement implies the presence of a CP

¹A CP analysis for MECs was in one form or another proposed by Garde (1976); Pesetsky (1982); Rudin (1986); Grosu (1987); Izvorski (1998); Caponigro (2003); Grosu (2004); Livitz (2010).

- This conjecture follows from the belief that wh-words possess features which need “checking” in a particular position in the fseq.
- Below, I’ll present an argument against the wh/CP conjecture, and therefore in favor of the “horizontal” syntax-freeness of wh-words.

2.1.2 Structure of the argument

- wh-words in MECs in some languages can move to the edge of virtually any syntactic category (section 2.2.1); this will be shown for Czech and Slovenian, but evidence suggests it holds also for Polish, to a certain extent Serbian, and possibly Russian and Hungarian
- wh-words in MECs are real (non-quantificational) operators, i.e. lambdas, and not indefinites (section 2.2.2).²
- the landing site targeted by wh-movement in different constructions does not depend on the properties of the wh-word itself, but rather on the operator which is about to select the resulting wh-construction (section 2.3).

2.2 Properties of wh in MECs

2.2.1 Cross-categorial targets for wh-movement in MECs

CP (FinP)

- “Normal” wh-movement; clitics in Czech sit in TP/FinP (Toman 1999; Lenertová 2004), i.e. the wh-word must be at least at the edge of those; the Czech order is slightly dispreferred, in Slovenian, this is even slightly degraded

- (4) a. *Czech*
 Neměl jsem [MEC proč [FinP ji Petrovi dát]].
 NEG:had be:PST.1SG why her Petr:DAT give:INF
 ‘There was no reason to give her to Petr.’
- b. *Slovenian*
 ?Včeraj nisem imel [MEC kdaj [FinP ga obiskati]].
 yesterday NEG:be:PST.1SG had when him:CL visit:INF
 ‘Yesterday there was no time for me to visit him.’

vP (or some functional projection above that, e.g. AspP or (at maximum) TP; in any case, it must be small enough to allow for clitic climbing)

- Clitic climbing

- (5) a. *Czech*
 Petrovi₁ jsem **ji**₂ neměl [MEC proč [vP dát t₁ t₂]].
 Petr:DAT be:PST.1SG her:CL NEG:had why give:INF
 ‘There was no reason to give her to Petr.’
- b. *Slovenian*

²All accounts I am aware of (perhaps with the exception of Surányi 2005) assume so. I argued for an analysis under which wh-words in MECs are variables in Šimík (2009), though I abandoned it in Šimík (2011).

Včera_j **ga**₁ n_{isem} imel [MEC kdaj [vP obiskati t₁]].
 yesterday him:CL NEG:be:PST.1SG had when visit:INF
 ‘Yesterday there was no time for me to visit him.’

- The matrix verb is a raising verb; it embeds impersonal predicates, (6), and it is capable of licensing the nominative on the embedded wh-word, (7)

- (6) a. *Czech*
 Nemá ti [MEC kvůli čemu [vP být smutno]].
 NEG:has:3 you:DAT because.of what be:INF sad:ADV
 ‘There’s nothing for which you could feel sad.’
- b. *Slovenian*
 Ni imelo [MEC kdaj [vP deževati]].
 NEG had when rain:INF
 ‘There was no time when it could rain.’

- (7) *Czech*
 Neměl mi [MEC kdo [vP pomoct]].
 NEG:had:SG.M me:DAT who:NOM.SG.M help:INF
 ‘There was nobody who could help me.’

AdjP (predicative)

- The wh-phrase *na co* appears at the edge of the AP: *pyšný* ‘proud’ in Czech.

- (8) a. *Czech*
 Karel nemá [být na co [AdjP pyšný]].
 Karel NEG:has be:INF on what proud
 ‘Karel has nothing to be proud of.’

- Let’s be careful: is perhaps (9) the right structural description of (8), in which case the wh moves to the edge of a verbal projection?

- (9) ...neg-have [XP be [vP on what [vP t [AdjP proud]]]]

- Probably not: we’d expect the movement of ‘be’ to be bled under sluicing (Lasnik 1999; Boeckx and Stjepanović 2001). While the movement of clitics (cf. (5a)) is bled, (10), the putative movement of ‘be’ is not bled, suggesting that there’s no movement at all, and hence, the movement really targets the edge of the AdjP:

- (10) *Czech*
 Chtěl jsem mu ji dát, ale neměl jsem {*
 wanted be:PST.1SG him:CL.DAT her:CL.ACC give:INF but NEG:had be:PST.1SG
 mu ji} [MEC kdy ~~[vP dát mu ji]]].
 him her when
 ‘I wanted to give it to her but there was no time [to give it to her].’~~

- (11) *Czech*

Karel je pyšný, i když nemá [MEC být na co [~~AdjP pyšný~~]].
 Karel is proud even when NEG:has be:INF on what
 ‘Karel is proud, though there’s no reason for him to be.’

- There’s a semantic question to this, too. If lambda-binding created by the wh-movement is created at a lower point than actually needed in semantics, how does it get higher? I don’t have a particularly insightful answer, but it is possible that the lambda “percolates” in much the same way as the slash in HPSG, which turns (12a) to (12b). Obviously, this percolation must be restricted. Let’s assume for now, that it’s restricted to the percolation across functional or semantically non-loaded lexical categories, cf. (13). Another option is that the copula is semantically empty (or an identity-function).

- (12) a. have [copula [λx [... x ...]]]
 b. have [λx [copula [... x ...]]]

- (13) *Czech*
 Bohužel jsem neměl [MEC { **komu** } [vP ukázat { * **komu** }
 unfortunately be:PST.1SG NEG:had who:DAT show:INF who:DAT
 krásy Prahy].
 beauties Praha:GEN
 ‘Unfortunately, there was nobody I could show the beauties of Prague to.’

AdvP (predicative)

- The wh-words in (14) are at the edge of an AdvP

- (14) a. *Czech*
 Marii přece nemá [MEC být z čeho [AdvP smutno]].
 Marie:DAT PRT NEG:has be:INF from what:GEN sad:ADV
 ‘There’s nothing Marie can be sad about.’
 b. *Slovenian*
 Nima ti [MEC biti česa [AdvP žal]].
 NEG:have you:DAT be:INF what sorry
 ‘There’s nothing you can feel sorry about.’

NP (predicative)

- The wh-word *kdo* ‘who’ appears at the edge of an NP; the infinitival copula *být* ‘be’ is “weak enough” to intervene between the wh-word and the selecting predicate *nemá* ‘NEG:has’³

- (15) *Czech*
 %Bohužel mi nemá [MEC být kdo [NP učitelem]].
 unfortunately me:CL:DAT NEG:has be:INF who:NOM teacher:INSTR
 ‘Unfortunately, there is nobody to teach me.’

PP

³I assume that this semantic weakness facilitates the percolation of the lambda-operator introduced by the wh-word to a position where it is accessible to the selecting operator.

- In (16), the wh-word *kam* can sit at the edge of a PP. The semantically weak verb *jít* ‘go’ can intervene between the wh-word *kam* ‘where:DIR’ and the selecting predicate *nemám* ‘NEG:have:1SG’.

- (16) *Czech*
 V tomto malém městě ani nemám [MEC { kam} jít {
 in this small town:LOC even:NCI NEG:have:1SG where:DIR go:INF
 kam} [PP do kina]].
 where:DIR to movies
 ‘In this small town there is not even a movie theater to go to.’

A minimal triple

- Here we have one set of truth-conditions derived by three different syntaxes:

- (17) a. **AdjP**
 Karel mu nemá být za co [AdjP tak vděčný].
 Karel him:CL NEG:has be:INF for what so grateful
 b. **VP**
 Karel mu nemá za co [VP být tak vděčný].
 Karel him:CL NEG:has for what be:INF so grateful
 c. **FinP**
 Karel nemá za co [FinP mu být tak vděčný].
 Karel NEG:has for what him:CL be:INF so grateful
 ‘There is nothing for which Karel could be so grateful to him.’

2.2.2 The wh is a (lambda) operator, the movement is a wh-movement

No wh in situ

- Wh-words in MECs always have to be ex situ, (18), as opposed to corresponding indefinites in truth-conditionally very similar sentences, which can be anywhere, (19).

- (18) a. Nemá [MEC po kom z rodiny zdědit husté vlasy]. (google)
 NEG:has after whom from family inherit:INF thick hair
 b. *Nemá [MEC zdědit husté vlasy po kom z rodiny].
 NEG:has inherit:INF thick hair after whom from family
 ‘There’s nobody in the family from whom he could inherit thick hair.’
- (19) a. Nemůže po nikom z rodiny zdědit husté vlasy.
 NEG:can:3 after anybody:NCI from family inherit:INF thick hair
 b. Nemůže zdědit husté vlasy po nikom z rodiny.
 NEG:can:3 inherit:INF thick hair after anybody:NCI from family
 ‘He can’t inherit thick hair from anybody in the family.’

- The same holds for the movement to the edge of other categories, such as AdjP or AdvP.

- (20) a. Nemá { po kom} [VP být { po kom} [AdjP vysoký {* po kom}]].
 NEG:has after whom be:INF after whom tall after whom
 ‘There’s nobody he could be tall after.’

- b. Nemá ti { proč } [_{vP} být { proč } [_{AdvP} smutno { * proč }]].
 NEG:has you:DAT why be:INF why sad:ADV why
 ‘There’s no reason for you to be sad.’

- In fact, the condition on wh-movement is even stricter than in wh-questions, since multiple wh-MECs are only allowed with multiple wh-movement, while multiple wh-questions are fine with single wh-movement.⁴

- (21) a. Nemám [_{MEC} koho se { na co } [_{vP} zeptat { * na co }]].
 NEG:have:1SG who RFL about what ask:INF about what
 ‘There’s nobody I could ask something.’ (approximate translation)
- b. Nevím [_{EQ} koho se { na co } [_{vP} zeptat { na co }]].
 ‘NEG:know:1SG who RFL about what ask:INF about what
 ‘I don’t know who to ask about what.’

Adjunct wh-words

- Adjunct wh-words, such as ‘how’ or ‘why’, cannot function as bare wh-indefinites cross-linguistically (see e.g. Gärtner 2009 for discussion and references).
- Yet, they are fine in MECs.

Sluicing

- Sluicing is generally freely available in MECs.⁵

- (22) a. *Czech*
 Chtěl bych psát, ale nemám o čem [_{vP} psát].
 want SBJ.1SG write:INF but NEG:have:1SG about what
 ‘I’d like to write but I don’t have anything to write about.’
- b. *Slovenian*
 Rad bi šel tja, ampak nimam kdaj [_{vP} ...].
 glad SUBJ go there but NEG:have:1SG when
 ‘I’d like to go there but there’s no time.’

- Sluicing of comparable bare wh-indefinites is impossible, cf. the following minimal pair from Slovenian.⁶

- (23) *Slovenian*
- a. Nekoga moram vprašati in na srečo imam koga (
 somebody:ACC have.to:1SG ask:INF and on luck have:1SG who:ACC
vprašati).
 ask:INF
 ‘I’d like to ask somebody but I don’t have who.’

⁴The following biconditional holds: A language has multiple wh-MECs iff the language has multiple wh-movement.

⁵The exceptions are Italian and Hungarian relative-like MECs; see Šimík (2011:5.3.3).

⁶See Hladnik and van Urk (2009) for a discussion of Slovenian bare wh-indefinites.

- b. Nekoga moram vprašati in na srečo **lahko koga** *(somebody:ACC have.to:1SG ask:INF and on luck possible who:ACC **vprašam**).
ask:1SG
'I'd have to ask somebody and luckily I can ask somebody.'

Other tests?

- *Weak crossover effects*: Czech and Slovenian WCO is too weak to work as a reliable test for anything
- *Parasitic gaps*: Czech and Slovenian only allow for parasitic gaps in finite relative clauses (cf. Golden 1997 for Slovenian). Those appear to be too “heavy” for MECs to embed in the first place. Some Polish speakers allow for parasitic gaps in participials (cf. Bondaruk 1996, 2003; Dornisch 1998). Unfortunately, testing them in MECs has yielded no consistent results yet.

2.3 Determining the target of wh-movement

2.3.1 Towards a generalization

MECs vs. infinitival EQs revisited

- We started with the following parallelism:

- (24) a. **Nevím** [EQ komu zavolat].
NEG:know:1SG who:DAT call:INF
'I don't know who to call.'
b. **Nemám** [MEC komu zavolat].
NEG:have:1SG who:DAT call:INF
'There's nobody who I could call.'

- Now that we know that the descriptive label “MEC” in (24b) can actually stand for a vP and not just a CP, does the same hold true of (24a)?
- Clitic-climbing data suggest that this is not the case:

- (25) a. Bohužel { * **mu** } **nevím** [EQ co { **mu** } dát].
unfortunately him:CL NEG:know:1SG what him:CL give:INF
'Unfortunately, I don't know what to give to him.'
b. Bohužel { **mu** } **nemám** [MEC co { **mu** } dát].
unfortunately him:CL NEG:have:1SG what him:CL give:INF
'Unfortunately, I don't have anything that I could give to him.'

- Let's be careful: Perhaps this is just because ‘know’ in Czech is not restructuring. What we need is an (optionally) restructuring verb which is capable of selecting infinitival embedded questions; *rozhodnout (se)* ‘decide’ is such a verb in Czech. If questions can be smaller than CPs, we'd expect restructuring to be possible in this case. Yet, it is not:

- (26) a. Včera se { **ho** } rozhodl odkázat { **ho** } synovi.
yesterday REFL it:CL.ACC decided bequeath:INF it:CL.ACC son:DAT

‘Yesterday he decided to bequeath it to his son.’

- b. Včera se { * **ho** } rozhodl [EQ komu { **ho** } odkázat].
 yesterday REFL it:CL.ACC decided who:DAT it:CL.ACC bequeath:INF
 ‘Yesterday he decided to whom to bequeath it.’

- It seems that the contrast above cannot be attributed to a hidden ambiguity of the verb ‘decide’. Notice that the following syllogism is valid:

- (27) a. He decided who to invite.
 b. He will invite John (and nobody else).

 c. He decided to invite John.

- Consider the conclusions in (29), which seem to me to follow from the observations summarized in (28).

(28) *Observations*

- a. Wh-movement in infinitival questions embedded under optionally restructuring verbs must target the CP.
 b. Wh-movement in infinitival constructions (in general) need not target the CP.

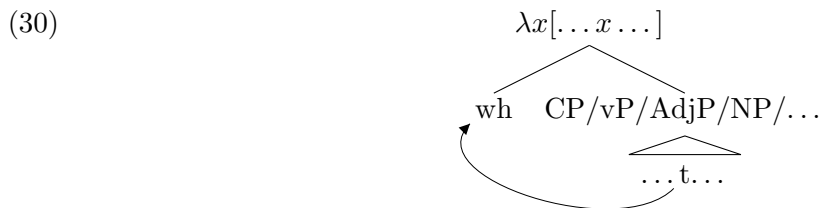
(29) *Conclusions*

- a. The CP-hood of embedded infinitival questions cannot be attributed to wh-movement.
 b. The CP-hood of embedded infinitival questions cannot be attributed to a non-existence of question-embedding restructuring verbs.
 c. The CP-hood of embedded infinitival questions should be attributed to their interrogative nature.

2.3.2 Operators and fseq

Where we are

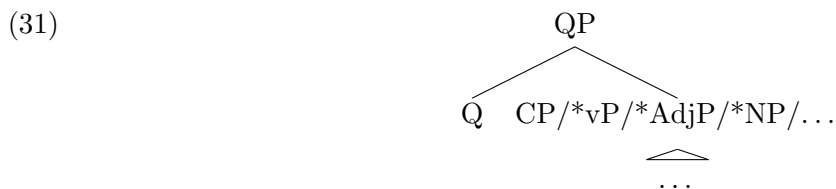
- The wh-morpheme/word, corresponding to a syntax-free lambda-operator, is *insensitive to fseq*.



- What *is* sensitive to fseq are operators which select for the abstracts created by wh-movement.

The question operator

- Let’s have a look at the question operator



- The question operator arguably relies on a world-abstract and variables over worlds are, possibly, generated only after the vP and TP are derived—after event, aspect, and temporal reference is settled.
- The question semantics of Groenendijk and Stokhof (1984) in terms of equivalence relations between possible worlds (partitions) support this idea:

(32) $[[Q]] = \lambda\alpha\lambda w[\alpha(w) = \alpha(w_0)]$ (à la Groenendijk and Stokhof 1984)

- Consider a couple of examples:

(33) $[[\text{know}]] = \lambda c\lambda x\forall w[w \in B_x(w_0) \rightarrow c(w)]$

(34) *Yes-no questions:* $\alpha \in D_{\langle s,t \rangle}$

- John knows Q whether Mary sings.
- $[[Q \text{ whether Mary sings}]] = \lambda w[\text{sings}'(w)(m) = \text{sings}'(w_0)(m)]$
- $[[\text{knows}]]([[Q \text{ whether Mary sings}]])([[\text{John}]])$
 $= \forall w[w \in B_j(w_0) \rightarrow [\text{sings}'(w)(m) = \text{sings}'(w_0)(m)]]$

(35) *Wh-questions:* $\alpha \in D_{\langle s, \langle e,t \rangle \rangle}$

- John knows Q what Mary sings.
- $[[Q \text{ what Mary sings}]] = \lambda w[\lambda x[\text{sings}'(w)(x)(m) = \lambda x[\text{sings}'(w_0)(x)(m)]]]$
- $[[\text{knows}]]([[Q \text{ what Mary sings}]])([[\text{John}]])$
 $= \forall w[w \in B_j(w_0) \rightarrow [\lambda x[\text{sings}'(w)(x)(m) = \lambda x[\text{sings}'(w_0)(x)(m)]]]$

- The question arises whether the question operator can also be applied in other categorial domains than just the clausal one. The answer seems to be affirmative, as proved by the existence of **concealed questions**.
- The following example shows that the very same question operator can be applied to individual concepts. See Heim (1979); Romero (2005); Frana (2010) for details of an analysis in terms of equivalence relations (possibly introduced by the question operator).

(36) *Concealed questions:* $\alpha \in D_{\langle s,e \rangle}$

- John knows Q the capital of Italy.
- $[[Q \text{ the capital of Italy}]] = \lambda w[[\text{the capital of Italy}]](w) = [[\text{the capital of Italy}]](w_0)]$
- $[[\text{knows}]]([[Q \text{ the capital of Italy}]])([[\text{John}]])$
 $= \forall w[w \in B_j(w_0) \rightarrow [[\text{the capital of Italy}]](w) = [[\text{the capital of Italy}]](w_0)]]$

The definite operator

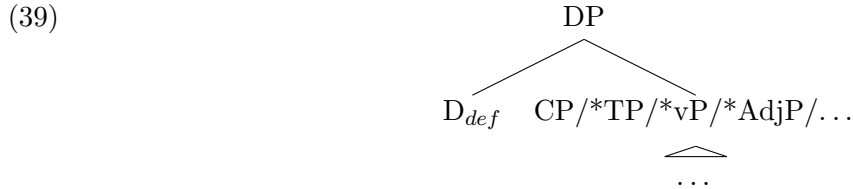
- The definite operator arguably applies fairly high in the nominal domain.

- See its simplified semantics (e.g. Russell 1905; Lewis 1979; Partee 1987)

$$(37) \quad \llbracket \text{the} \rrbracket = \llbracket D_{def} \rrbracket = \lambda P : \exists !x[P(x)].\iota x[P(x)]$$

$$(38) \quad \llbracket \text{the dog} \rrbracket = \iota x[\text{dog}'(x)]$$

- Again, there appears to be a parallelism in the clausal domain: **free relatives**, which are interpreted as definites (Jacobson 1995; Caponigro 2003; Hinterwimmer 2008) are always structurally large, in fact, they appear to obligatorily involve finiteness.⁷



- (40) a. Mary likes what John bought.
 b. *Mary likes what to buy. (cross-linguistically)

- (41) a. $\llbracket [D_{def} \text{ what John bought}] \rrbracket = \iota x[\text{bought}'(j, x)]$
 b. $\llbracket [\text{Mary likes } D_{def} \text{ what John bought}] \rrbracket = \text{likes}'(m, \iota x[\text{bought}'(j, x)])$

MECs

- What characterizes the embedder of MECs such that they are indifferent with respect to the category they select? We'll have a look at that in one of the following days...

⁷See Šimík (2010a) for my view of the relation between finiteness and definiteness in free relatives.

Lecture 3

The meaning of wh

3.1 Introduction

- What is the meaning of the wh-morpheme and of a wh-phrase?
- How do these theories fare in view of other constructions than questions?

3.2 Semantics and pragmatics of wh-phrases and wh-fronting

An overview:

- Theories about the semantics, pragmatics (and phonology) of wh-movement
 - (1) a. Wh-words are quantifiers, hence wh-movement is quantifier raising.¹
 - b. Wh-words are focused (e.g. exhaustively) expressions, hence wh-movement is focus movement²
 - c. Wh-words are topics, hence wh-movement is topic-movement.³
 - d. Wh-movement has no particular semantic effect, except for “variable-raising”.⁴
 - e. Wh-movement is for reasons of clause-typing.⁵
 - f. Wh-movement is to bring the relevant variable into the phonological domain of the question operator.⁶
 - g. Wh-movement corresponds to lambda-operator placement.⁷
- Theories about the denotation of wh-words in their SS/LF-fronted form or in theories with no semantically relevant fronting

¹Baker (1970); Chomsky (1973); May (1977); Chomsky (1977); Karttunen (1977); Hintikka (1983); Engdahl (1986); É. Kiss (1993); Dayal (1996); Higginbotham (1996); von Stechow (1996); Gutiérrez-Rexach (1997); Cole and Hermon (1998); among others.

²See e.g. Horváth (1986); É. Kiss (1991); Brody (1995); Rizzi (1997); Bošković (1998); Sabel (1998, 2000, 2001, 2003); Sinopoulou (2008); Haida (2007, 2008); among others.

³See e.g. Grohmann (2000, 2006); Jaeger (2003, 2004); among others.

⁴Nishigauchi (1990); Berman (1991); Hagstrom (1998); Beck (2006); among others.

⁵Cheng (1991, 1997); among others.

⁶Richards (2010).

⁷von Stechow (1982); Groenendijk and Stokhof (1984); Heim and Kratzer (1998).

- (2)
- a. Wh-words map to generalized quantifiers (existential and/or universal; static or dynamic; over individuals, Skolem functions, or choice-functions)⁸
 - b. Wh-words map to variables (ordinary or distinguished; individual, Skolemized, or choice-functional).⁹
 - c. Wh-words map to sets of individuals.¹⁰
 - d. Wh-words map to a definite description dominating a variable.¹¹
 - e. Wh-words map to domain-restrictors.¹²
 - f. Wh-words map to logical lambdas (syncategorematic expressions).¹³

3.3 More detailed exposition of some analyses

3.3.1 The simple existential quantifier approach and its failure

Basic idea

- Wh-phrases (e.g. *which man*) are simply indefinites and (hence) existential quantifiers (e.g. *some man*). In Karttunen, they can be distinguished from indefinites by their distribution: they quantify above “protoquestions”.

Two possibilities

1. The wh-restriction is interpreted high (in the quantificational restriction) (as in the original proposal of Karttunen 1977)
2. The wh-restriction is interpreted low (in the quantificational nucleus) (as, e.g., in Hamblin 1973)

High interpretation

- Consider the following question and Karttunen’s analysis of it

- (3)
- a. Who called?
 - b. $\lambda p \exists x [\text{human}'(w_0)(x) \wedge p(w_0) = 1 \wedge \underline{p = \lambda w [\text{called}'(w)(x)]}]$
- (4)
- a. Which students called?
 - b. $\lambda p \exists x [\text{students}'(w_0)(x) \wedge p(w_0) = 1 \wedge \underline{p = \lambda w [\text{called}'(w)(x)]}]$

- The problem of underived *de dicto* readings (see also last week lectures): Since the meaning of the wh-restriction is not represented in the set of possible answers, the entailment in (4) is valid. And this is not nice.

- (5)
- a. John knows who called.
 - \Rightarrow
 - b. John knows which students called.

⁸See fn. 1.

⁹Nishigauchi (1990); Berman (1991); Reinhart (1998); Beck (2006).

¹⁰Hamblin (1973); Ramchand (1996, 1997); Hagstrom (1998); Kratzer and Shimoyama (2002); Cable (2007, 2010).

¹¹Sauerland (1998a); Rullmann and Beck (1998); Fox (1999); Novel and Romero (2010); Johnson (in press).

¹²Caponigro (2003, 2004).

¹³von Stechow (1982); Groenendijk and Stokhof (1984); Heim and Kratzer (1998).

Low interpretation

- We can fix this problem by putting the wh-restriction into the nucleus, no matter how we achieve this technically (e.g. by Hamblin's pointwise function application):

$$(6) \quad \begin{array}{l} \text{a. Who called?} \\ \text{b. } \lambda p \exists x [p(w_0) = 1 \wedge \underline{p = \lambda w [\text{human}'(w)(x) \wedge \text{called}'(w)(x)]}] \end{array}$$

$$(7) \quad \begin{array}{l} \text{a. Which students called?} \\ \text{b. } \lambda p \exists x [p(w_0) = 1 \wedge \underline{p = \lambda w [\text{students}'(w)(x) \wedge \text{called}'(w)(x)]}] \end{array}$$

- **The Donald Duck problem** (Reinhart 1992) Once we interpret wh-restrictions in-situ, we run into another problem:

$$(8) \quad \begin{array}{l} \text{a. Who will be angry if John invites which philosopher?} \\ \text{b. } \lambda p \exists x \exists y [p(w_0) = 1 \wedge p = \lambda w [\forall w' [w' \in A(w) \wedge \text{philosopher}'(w')(y) \wedge \text{invite}'(w')(j, y) \rightarrow \text{angry}'(w')(x)]]] \end{array}$$

- A possible answer to the question above is (9b), which is not so nice. A clearer paraphrase of that answer is in (9a).

$$(9) \quad \begin{array}{l} \text{a. Mary will be angry if John invites Donald Duck.} \\ \text{b. Mary will be angry if Donald Duck were a philosopher and if John invited him.} \end{array}$$

- **Another problem** is that the questions in (10) and (11) are predicted to have an identical reading, again, not so nice.

$$(10) \quad \begin{array}{l} \text{a. They told us } [Q \text{ which students are qualified applicants}]. \\ \text{b. } \llbracket Q \rrbracket = \lambda p \exists x [p(w_0) = 1 \wedge \underline{p = \lambda w [\text{students}'(w)(x) \wedge \text{qualified}'(w)(x)]]] \end{array}$$

$$(11) \quad \begin{array}{l} \text{a. They told us } [Q \text{ which qualified applicants are students}]. \\ \text{b. } \llbracket Q \rrbracket = \lambda p \exists x [p(w_0) = 1 \wedge \underline{p = \lambda w [\text{qualified}'(w)(x) \wedge \text{students}'(w)(x)]]] \end{array}$$

3.3.2 Choice-functional analysis

Basic idea

- Wh-determiners (e.g. *which*) denote choice functions rather than quantificational determiners. Wh-restrictions (e.g. *man*) denote one-place predicates, as usually.

$$(12) \quad \begin{array}{l} \text{which man} \\ \text{a. } \llbracket \text{which} \rrbracket = \lambda P_{\langle e, t \rangle} [y : P(y)] \\ \text{b. } \llbracket \text{man} \rrbracket = \lambda x [\text{man}'(x)] \\ \text{c. } \llbracket \text{which man} \rrbracket = \llbracket \text{which} \rrbracket (\llbracket \text{man} \rrbracket) \\ \quad = [\lambda P [y : P(y)]] (\lambda x [\text{man}'(x)]) \\ \quad = y : [\lambda x [\text{man}'(x)]] (y) \\ \quad = y : \text{man}'(y) \end{array}$$

- Now, a Hamblin/Karttunen-style semantics of questions using choice functions:

- (13) a. Which professor did John invite?
 b. $\lambda p \exists f [\text{CH}(f) \wedge p = \text{invited}'(j, f(\text{professor}'))]$

- Choice functions, or more precisely choice-function variables, are a powerful device. They allow you to interpret an indefinite in situ, while giving it wide (or in fact any kind of) scope:

- (14) a. Every student read some book.
 b. $\exists f [\text{CH}(f) \wedge \forall x [\text{student}'(x) \rightarrow \text{read}'(x, f(\text{book}'))]]$
 c. $\forall x [\text{student}'(x) \rightarrow \exists f [\text{CH}(f) \wedge \text{read}'(x, f(\text{book}'))]]$

Solution to the problems?

- **The Donald Duck problem** Reinhart (1998) says that the choice-functional approach solves the Donald Duck problem, but I don't quite see why it is so. In particular, how can we guarantee that the individual that the choice function picks out is a philosopher in the evaluation world? Reinhart (1998:41) gives the simplified representation in (15b) (adapted), where this is not visible, but when we enrich the representation with world variables, the problem suddenly surfaces, I think:¹⁴

- (15) a. Who will be angry if John invites which philosopher?
 b. $\{p : \exists (x, f) [\text{CH}(f) \wedge \forall p \wedge p = \wedge [\text{invites}'(j, f(\text{philosopher}')) \rightarrow \text{angry}'(x)]]\}$
 c. $\lambda p \exists x \exists f [\text{CH}(f) \wedge p(w_0) = 1 \wedge p = \lambda w [\forall w' [w' \in A(w) \wedge \underline{\text{philosopher}'(w')(y)} \wedge \text{invite}'(w')(j, y) \rightarrow \text{angry}'(w')(x)]]]$

- It seems that Reinhart presupposes that choice functions can only select individuals which satisfy its argument *in the evaluation/actual world*—i.e. *actual* philosophers, disregarding *possible* philosophers. But I don't see anything in the choice functional approach itself which forces this.

Generalizing the choice-functional approach (Hagstrom 1998; Cable 2007)

- Idea: Q-particles denote choice functions.
- Q-particles are not always adjacent to wh-restrictions: they can attach much higher.
- Q-particles are **generalized choice functions**: they select a set of objects of any type and pick an object out of it.

$$(16) \quad \llbracket \text{Q-part} \rrbracket = \lambda P_{\langle \sigma, t \rangle} [x_\sigma : P(x)]$$

- In order to capture this generality, wh-words/stems are treated as **sets of objects**, i.e. Hamblin pronouns, rather than predicates.

¹⁴Reinhart (1998) writes: “Turning to our problem case, [...] we apply the same procedure, where the choice function bound by the question operator selects a value from the philosopher set. Although the restriction occurs in an *if*-clause, the values permitted in the answer can only be from the philosopher set, as we saw already in the discussion of [...] the existential *some philosopher*.” (41) “Although the N-restriction (*philosopher*) [in *some philosopher*] has stayed in situ, inside the *if*-clause, the representation [using choice functions] captures its truth conditions correctly. It states that a function exists such that if we invite the philosopher it selects, Max will be offended. In a model where the N-set is non-empty, [this] is equivalent to the standard representation of [a] wide scope [existential quantifier over individuals].” (39)

$$(17) \quad \llbracket(\text{wh})_o\rrbracket = \{x : \text{human}'(x)\}$$

- Function application must be amended, to a *pointwise* (Hamblin 1973; Kratzer and Shimoyama 2002) or *flexible* (Hagstrom 1998) function application.

(18) Flexible function application (Hagstrom 1998)

$$\llbracket f \rrbracket(\llbracket a \rrbracket) =$$

a. $f(a)$ or

b. $\lambda m \exists x [a(x) \wedge m = f(x)] = \{f(\mathbf{a})\}$ or

c. $\lambda m \exists g [f(g) \wedge m = g(a)] = \{\mathbf{f}(a)\}$ or

d. $\lambda m \exists x \exists g [a(x) \wedge f(g) \wedge m = g(x)] = \{\mathbf{f}(\mathbf{a})\}$

(whichever is defined)

f, a are ordinary

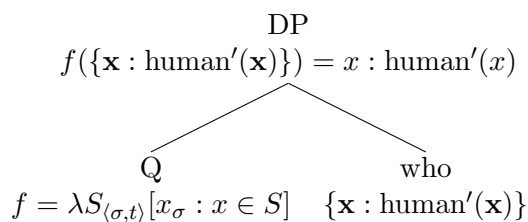
a is a set

f is a set

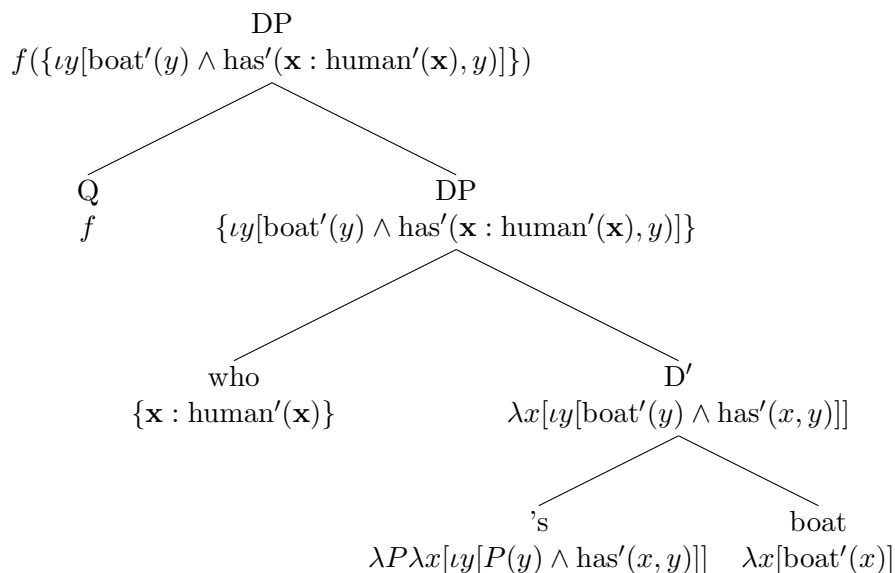
f, a are sets

- The structure of a wh-phrase therefore looks roughly as follows:

(19) who

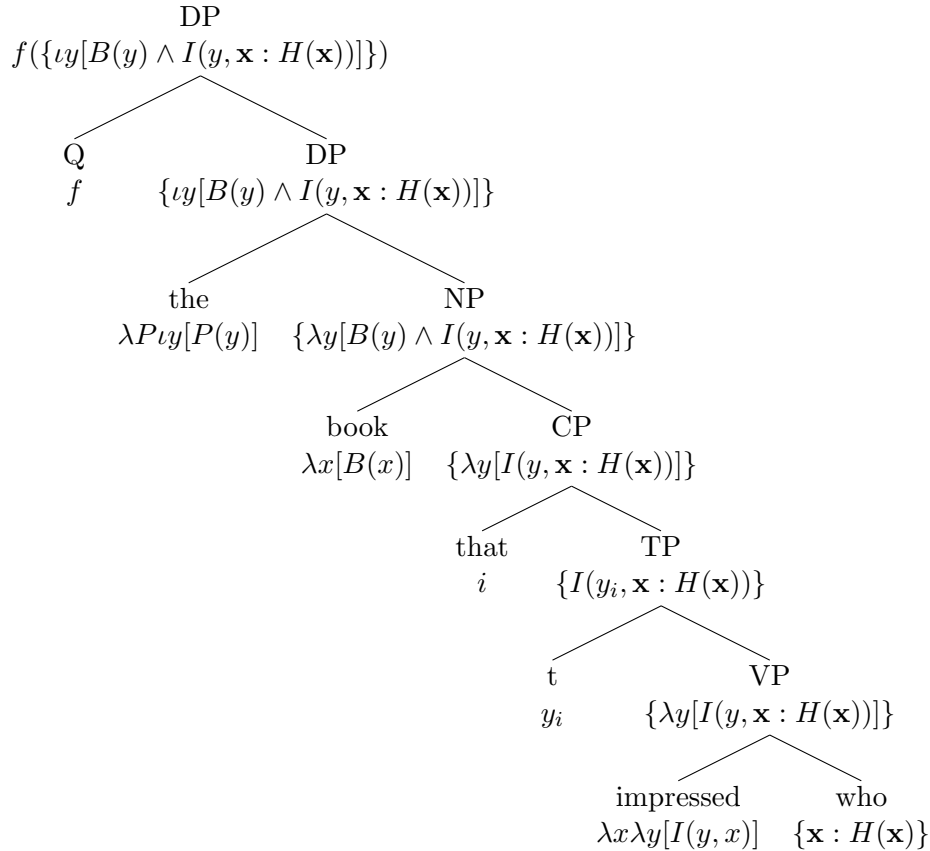


(20) whose boat



(21) the book that impressed who¹⁵

¹⁵Movement out of/abstraction into Hamblin-style sets is not a trivial issue and I'm abstracting away from the problem associated with it. See the discussion in Hagstrom (1998), and mainly the problem noticed by Shan (2004) and a solution offered by Novel and Romero (2010).



- An example of a full question (Hamblin/Karttunen-style):

- (22)
- Whose boat did John buy?
 - $\lambda p \exists f [p = \text{bought}'(j, f(\{\iota y[\text{boat}'(y) \wedge \text{has}'(\mathbf{x} : \text{human}'(\mathbf{x}), y)]\}))]$
 - The set of propositions p such that there exists some choice function f such that p is the proposition that John bought the individual selected by the choice function and that individual is the boat of some individual x .

3.3.3 Wh-phrases as hidden definite descriptions

Basic idea

- Wh-phrases like *which man* in fact denote an “open definite description”, i.e. a definite description containing a free variable: informally, ‘the man x ’ or ‘the x man’. There are more possible implementations. I’m using the one of Johnson (in press) (who is in turn following Sauerland 1998a; 2004 and Fox 1999; 2002).¹⁶

- (23)
- $\llbracket \text{which} \rrbracket = \lambda x \lambda P : \exists z [P(w_0)(z)].[\iota y [P(w)(y) \wedge x = y]]$
 - $\llbracket \text{man} \rrbracket = \lambda x [\text{man}'(x)]$

¹⁶While standard definites are assumed to introduce two presuppositions, i.e. *the NP* presupposes (i) that the extension of NP is non-empty and (ii) that it contains exactly one element, I follow the works cited that the presupposition of *which NP* is mainly (and perhaps only) the existence one. This assumption is important mainly for the use of hidden definite descriptions in relative clauses.

- Here is a simple question:

- (24) a. Which man came?
 b. $\lambda p \exists x [p = \text{came}'(\iota y [\text{man}'(y) \wedge x = y])]$
Presupposition: $\exists z [P(w_0)(z)]$
 c. The set of propositions p such that there exists some individual x and the proposition is that some (actual) man y came and x is that man.

Solution to the problem

- **The Donald Duck problem** is solved quite elegantly under this approach. Notice first that definite descriptions contribute **presuppositions** which “project” out of conditional clauses:

- (25) If Mary’s dog died, she’d be sad.
 a. ‘Mary has a dog. If the dog dies, she’ll be sad.’
 b. #‘If Mary had a dog and he died, she’d be sad.’
- (26) a. If a unicorn shows up, we’re crazy.
 b. If the unicorn shows up, I’ll shoot him with my magic arrow.

- Since the *wh*-phrase is a hidden definite and it comes with an existence presupposition and this presupposition projects (must be satisfied with respect to the evaluation/actual world), the individual denoted by *which philosopher* must be an actual philosopher. So, the answer in (28) is not an answer because Donald Duck is not an actual philosopher.

- (27) a. Who will be angry if John invites which philosopher?
 b. $\lambda p \exists x [p = \lambda w [\forall w' [w' \in A(w) \wedge \text{invite}'(w')(j, \iota y [\text{philosopher}'(w')(y) \wedge x = y]) \rightarrow \text{angry}'(w')(x)]]]$
Presupposition: $\exists z [\text{philosopher}'(w_0)(z)]$

- (28) #Mary will be angry if John invites Donald Duck.

3.4 Relative clauses

For a start

- Relative clauses in many languages involve *wh*-movement (not only European languages, but also many American languages, see e.g. Caponigro et al. 2011 and the references cited there).
- It would be nice if our analysis of *wh*-phrases could account for this use, too.

Standard semantic analysis of relative clauses

- **Headed relatives** Headed relative clauses denote sets of individuals which satisfy the description provided by the clause (also: one-place predicates over individuals, properties of individuals). This analysis goes back to Quine (1960); Rodman (1972); Partee (1973); Bach and Cooper (1978), and remains basically uncontested until today.

- (29) a. The $[\text{NP } [\text{RC who is sleeping}]]$ is tired.

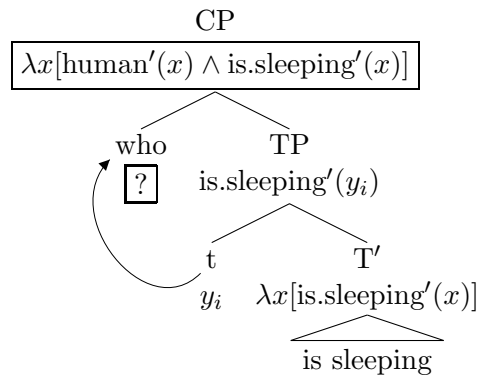
- b. $\llbracket \text{who is sleeping} \rrbracket = \lambda x[\text{is.sleeping}'(x)]$
- c. $\llbracket \text{student} \rrbracket = \lambda x[\text{student}'(x)]$
- d. $\llbracket \text{student who is sleeping} \rrbracket = \lambda x[\text{student}'(x) \wedge \text{is.sleeping}'(x)]$ *by pred. modification*
- e. $\llbracket \text{the student who is sleeping} \rrbracket = \iota x[\text{student}'(x) \wedge \text{is.sleeping}'(x)]$
- f. $\llbracket (29a) \rrbracket = \text{is.tired}'(\iota x[\text{student}'(x) \wedge \text{is.sleeping}'(x)])$

- **Free relatives** Free relative clauses denote an individual, in particular the maximal (plural) entity which satisfies the description provided. This is also the denotation of definite noun phrases. See e.g. Jacobson (1995); Pancheva-Izvorski (2000); Caponigro (2003); Hinterwimmer (2008). For a fundamentally different view, see e.g. Wiltschko (1999).

- (30)
- a. Who is sleeping will have to wake up.
 - b. $\llbracket \text{D who is sleeping} \rrbracket = \iota x[\text{is.sleeping}'(x)]$
 - c. $\llbracket (30a) \rrbracket = \text{will.have.to.wake.up}'(\iota x[\text{is.sleeping}'(x)])$ where x can be a plural entity

- **Semantics of the relative-clause core**, i.e. before the relative clause combines either with an NP head, (29), or with the iota operator, (30).

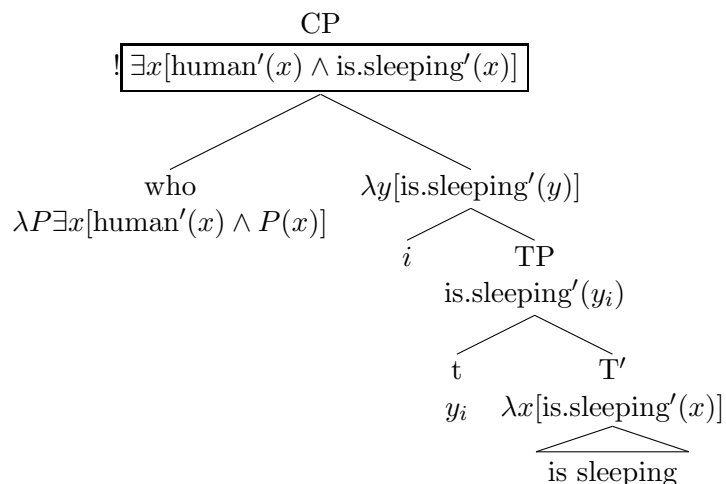
(31)



3.4.1 Wh-phrases as existential quantifiers?

- These theories fail. If the wh-word is an existential quantifier, then the result is an existentially quantified statement, i.e. a proposition. As such, it cannot combine with either an NP (by predicate modification), or with a D.

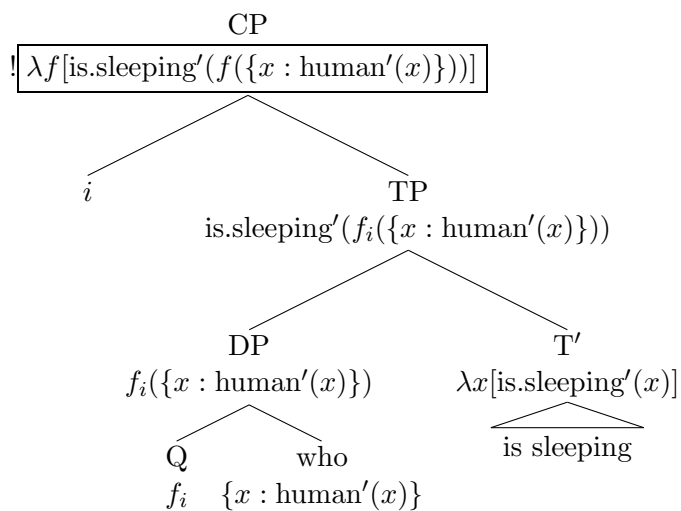
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3.4.2 Wh-phrases as choice functions plus sets?

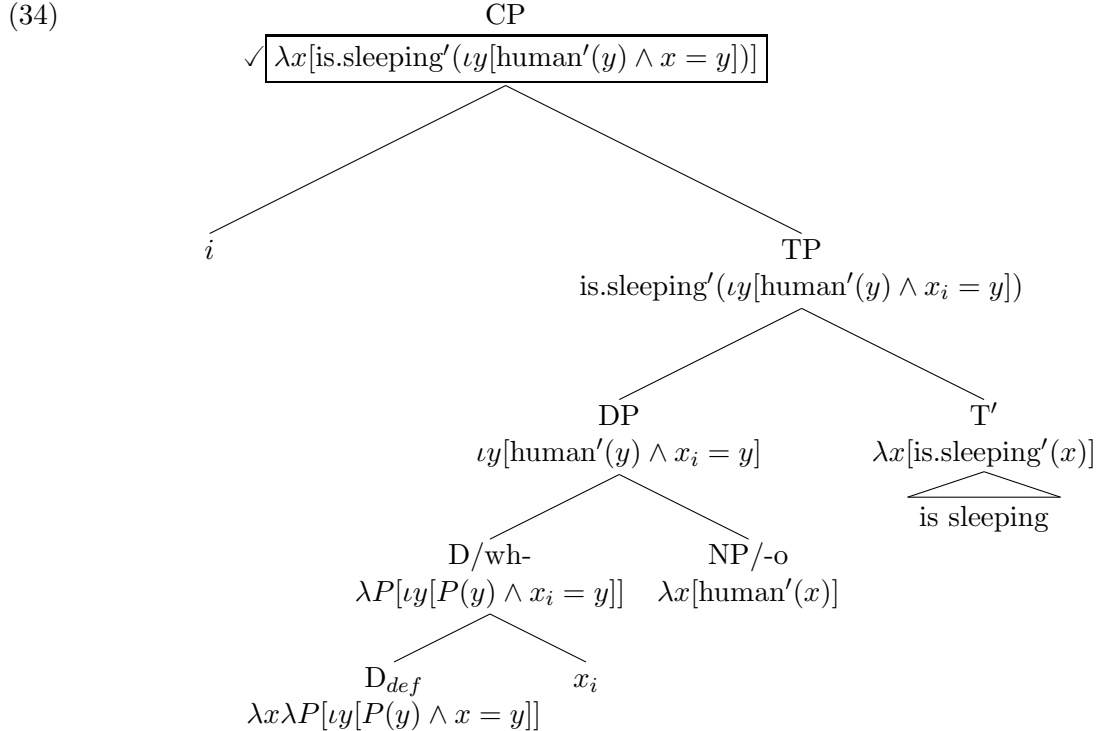
- Bad predictions. Even if we don't quantify over the choice function variable, i.e. if we simply lambda-bind it, we get a property/set of choice functions, rather than set of individuals. This expression cannot combine with an NP head, nor can it be selected by an ordinary iota operator.

(33)



3.4.3 Wh-phrases as hidden definites?

- These fare quite well. See mainly Sauerland (1998a, 2004); Hulsey and Sauerland (2006) for discussion.



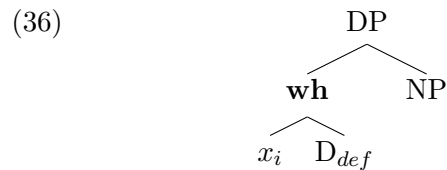
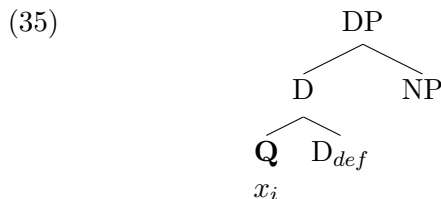
3.5 Wh-morphemes and Q-particle

For a start

- Wh-morphemes and Q-particles have a comparable function: they both appear to facilitate a binding relation between an operator (e.g. a question operator in questions or an existential operator in indefinites) and some restricted variable. A unified analysis is desirable (in my opinion).
- The choice-function analysis of Q-particles isn't flexible enough to capture the semantics of relative clauses.¹⁷
- Is it possible to unify the two under the “syntax-free” index-analysis?

3.5.1 A tentative proposal

- Q-particles are “pure” indices, wh-morphemes are indices plus something, e.g. the definite determiner.



¹⁷This problem obviously arises only for languages which use Q-particle in their relative clauses. This is the case e.g. in Tlingit, in which Q-particles are used in free relatives. Cable (2007: Chapter 6) includes a brief discussion of Tlingit free relatives but does not discuss the problematic predictions.

- The syntax-freeness of Q-particles gives them the freedom to move quite freely (modulo syntactic cycles—phases).
- In contrast, the “Q-particle” in wh-languages is “frozen” within the wh-morpheme, which already contains some syntactic category (such as D). On top of that, the wh-morpheme is a bound one and can only be spelled out on yet another category—the categorial stem (e.g. *-o* in *who*). This is why the movement of wh-morphemes/words/phrases must respect syntactic restrictions.

3.5.2 Successive cyclic movement

Assumption

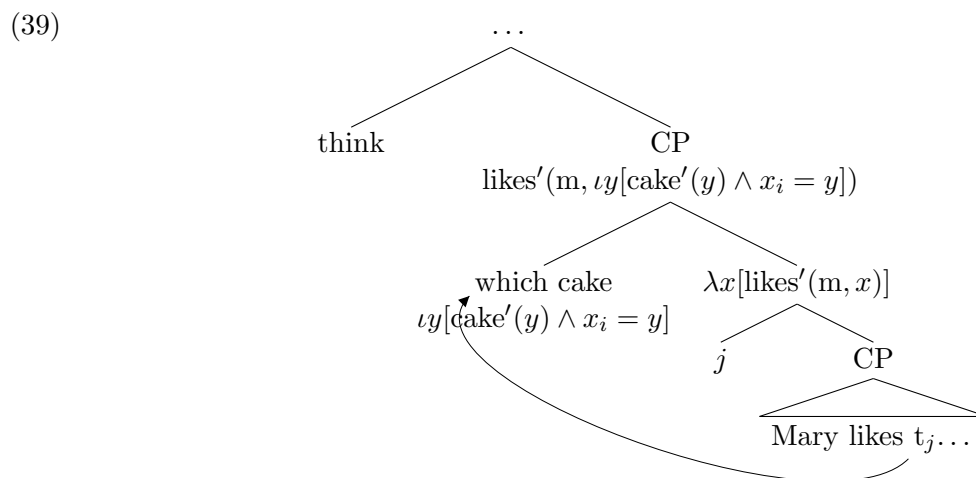
- On their way to the “criterial position” (à la Rizzi 2006), i.e. the position immediately dominated by the sister of the relevant operator, e.g. the question operator, the Q-particle/wh-word stops at intermediate sites in order to make the index available for binding from higher cycles/phases:¹⁸

(37) Q [_{CP} λx_i [_{DP} Which_i cake]_j] do you think [_{CP} t_j Mary likes t_j].

(38) Q [_{CP} λx_i you think [_{CP} t_i Mary likes [_{DP} (t_i) which_i cake]]].

How to model this in semantics

- Successive cyclic movement corresponds to adjoining the relevant word/phrase or particle at the edge of the phase and immediately feeding its semantics back into the abstract that the movement created. This is basically the “variable-raising” that we mentioned before.¹⁹



3.5.3 The final step

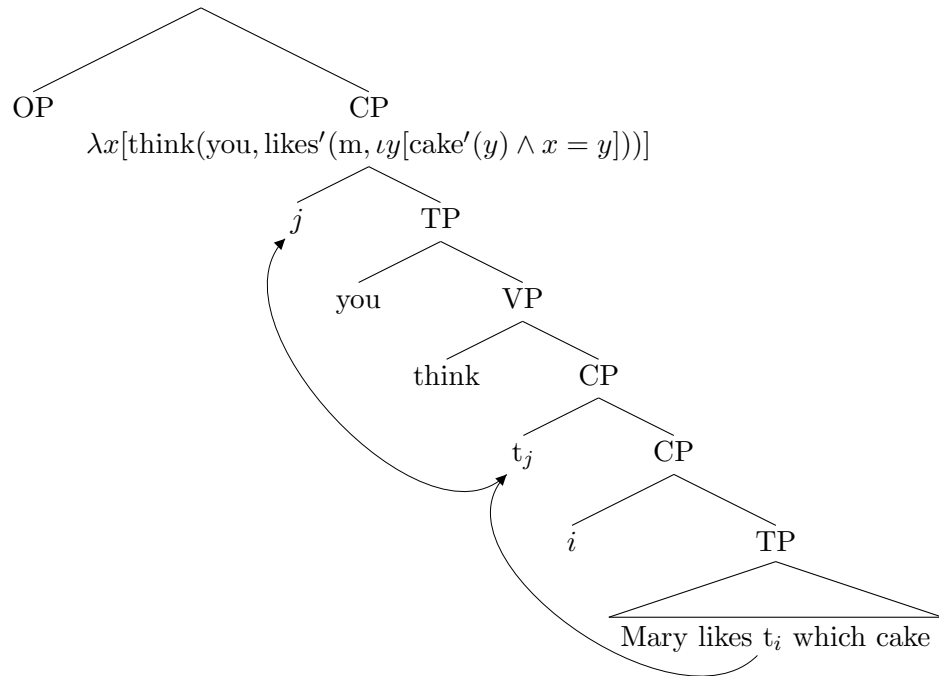
The “easy” case: Q-particle fronting

- If a Q-particle reaches its “criterial position”, the resulting structure is ready to be selected by the operator (the question operator, iota operator, etc.).

¹⁸See Hagstrom (1998) for evidence that Q-particles undergo successive cyclic movement (in Japanese).

¹⁹See Adger and Ramchand (2005) for an alternative view of the syntax/semantics of successive cyclicity.

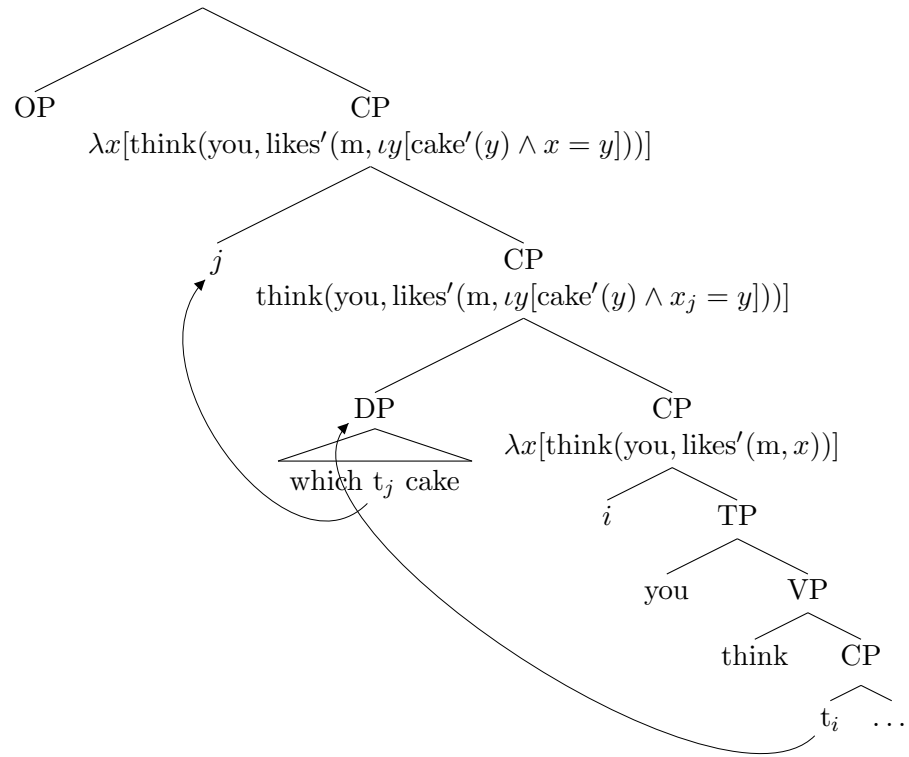
(40)



The “harder” case: Wh-phrase fronting

- If a wh-phrase reaches its “criterial position”, however, the wh-introduced index is still embedded within the wh-phrase.
- I’ll suppose that the final step is that the *wh-introduced variable raises from inside of the wh-phrase to the main spine of the tree*, call this **variable ejection**. This is, in a way, a super-short movement. Notice that languages, in general, like to place wh-words to the edge of the phrases (cf. e.g. Hungarian possessive wh-words, Szabolcsi 1994, or Tzotzil “P-inversion”, Aissen 1996). This is, I’d say, in order to facilitate the ejection.

(41)



Lecture 4

Modal existential wh-constructions

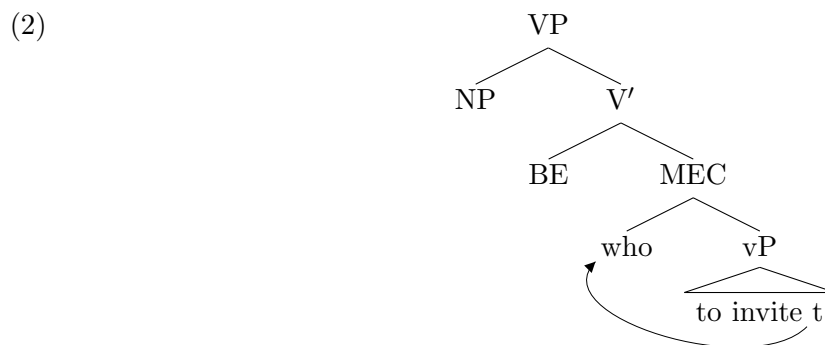
4.1 Analysis

4.1.1 Syntax

Proposal

- The example in (1) receives the structural analysis in (2).
- I label the MEC purely descriptively—remember that we know that it can be of variable syntactic size.

(1) Je [_{MEC} koho pozvat t].
is who:ACC invite:INF
'There is somebody to invite.'



- Notice that the matrix verb *je* 'is' (impersonal) takes *two* arguments rather than just one. The external one—the thing whose existence is being stated, remains phonologically unrealized.

4.1.2 Semantics

- What are the truth-conditions of (1)? In my intuition, there are three main components of MECs' truth-conditions:

(3) The sentence 'is who to invite' is **true** iff

- a. some (human) individual is in the state of existence/availability,¹
- b. there is a possibility to invite that individual,
- c. the availability and the possibility are tightly related: the possibility is felt to be a direct consequence of the availability.

- A note on the **modality**: Notice that the *availability* of some object/individual naturally leads to the *possibility* to do something with that object/individual. Crucially, it does not lead to the *necessity* to do something. From that perspective, MECs differ from infinitival relatives and infinitival questions, whose modality is left underspecified by grammar and it is up to context to decide (see Bhatt 1999, 2006):

- (4) a. – Will you join us for dinner? – I’m sorry, I can’t, I have something [□ to read].
 b. – I’m sorry you have to wait here. – No problem, I have something [◇ to read].

- (5) Let’s think about [what to give to John]...
 a. ...in order to please him. (□)
 b. ...for his birthday. (◇)

- A note on the **obligatory presence of the wh-operator**: Notice that the availability of *some object* naturally leads to the possibility to do something with *that object* and not just to any possibility. This is the reason why MECs characterize not just events/situations, but rather events/situations relativized to an individual. This “relativization” of the situation is facilitated by the wh-movement. Eventually, the variable bound by the wh-word gets bound by the same existential quantifier which also binds the argument of BE—the object which is available.

- Now, let’s see how we can write (3) in a more formal way;² (6a) through (6c) spell-out how the parts of the formula map onto the intuitive components of the truth-conditions in (3)

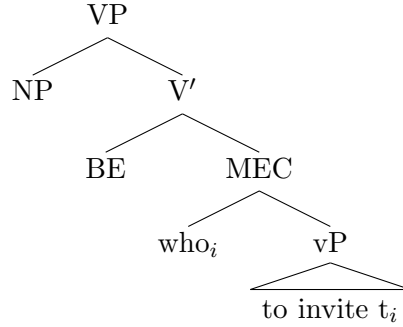
- (6) [[is who to invite]] = 1 iff
 $\exists x \exists s [\text{Availability}'(s) \wedge \text{Theme}(s, x) \wedge \exists s' [s' \in A(s) \wedge \text{Invite}'(s') \wedge \text{Theme}'(s', x)]]$
 a. (3a) $\approx \exists x \exists s [\text{Availability}'(s) \wedge \text{Theme}(s, x)]$
 b. (3b) $\approx \exists s' [s' \in A(s) \wedge \text{Invite}'(s') \wedge \text{Theme}'(s', x)]$
 c. (3c) $\approx s' \in A(s)$

- How can we derive the truth-conditions in (6) compositionally? What meaning do the individual parts have?

¹The identity of the individual is felt as irrelevant, though the truth-conditions are compatible with the individual being *epistemically specific*, i.e. known to the speaker and/or hearer.

²I’m assuming neo-Davidsonian event-semantics combined with the idea that events can be identified with situations (Kratzer 2008) and situations are in turn parts of possible worlds (Kratzer 1989). Event/state/situation variables are designated by s, s', \dots

(7)



- (8)
- $\llbracket vP \rrbracket = \lambda s [\text{Invite}(s) \wedge \text{Theme}(s, x_i)]$
 - $\llbracket \text{MEC} \rrbracket = \lambda x \lambda s [\text{Invite}(s) \wedge \text{Theme}(s, x)]$
 - $\llbracket \text{BE} \rrbracket = \lambda Q_{\langle e, \langle s, t \rangle \rangle} \lambda P_{\langle e, t \rangle} \exists x_e \exists s_s [\text{Availability}'(s) \wedge \text{Theme}(s, x) \wedge P(x) \wedge \exists s' [s' \in A(s) \wedge Q(x)(s')]]$
 - $\llbracket V' \rrbracket = \lambda P \exists x \exists s [\text{Availability}'(s) \wedge \text{Theme}(s, x) \wedge P(x) \wedge \exists s' [s' \in A(s) \wedge \text{Invite}(s') \wedge \text{Theme}(s', x)]]$
 - $\llbracket \text{NP} \rrbracket = P_c$
 - $\llbracket \text{VP} \rrbracket = \exists x \exists s [\text{Availability}'(s) \wedge \text{Theme}(s, x) \wedge P_c(x) \wedge \exists s' [s' \in A(s) \wedge \text{Invite}(s') \wedge \text{Theme}(s', x)]]$

4.2 Distribution

4.2.1 Other predicates than BE

- Most of the properties of MECs are derived from BE: their modality, as well as the necessity of wh-movement.
- But how about examples like the following MECs, which also have the same properties, while not being embedded under BE?

(9) *Portuguese*

- Dei-lhe** [MEC o que fazer].
gave:1SG-to.him:CL the what do:INF
'I gave him what to do.'
- Arranjei** [MEC com que me entreter].
found:1SG with what myself:CL amuse:INF
'I found with what to amuse myself.'
- ?**Procuo** [MEC com quem dividir um apartamento].
look.for:1SG with whom share:INF a flat
'I am looking with whom to share a flat.'

(10) *French*

- Il est **arrivé** [MEC de quoi manger].
it be:3SG come of what eat:INF
'There arrived something that one can eat.'
- ?Elle a **construit** [MEC de quoi mesurer la pression].
she have:3SG built of what measure:INF the pressure
'She has built something with which she/one can measure the pressure.'

(11) *Ukrainian*

- a. Ya **znayshov** [_{MEC} chym poremontuvaty mashynu].
 I found what:INSTR repair:INF car
 ‘I found something with which I can repair the car.’
- b. Vony **vyslaly** / **prynesly** meni [_{MEC} chym myty pidlogu].
 they sent / brought me what:INSTR wash:INF floor
 ‘They sent/brought me something with which I can wash the floor.’

- There are three possibilities that come to mind: (i) the analysis in terms of BE is too restrictive, (ii) the same properties assigned to BE must also be assigned to other predicates, (iii) BE is actually present in all the verbs that can embed MECs.

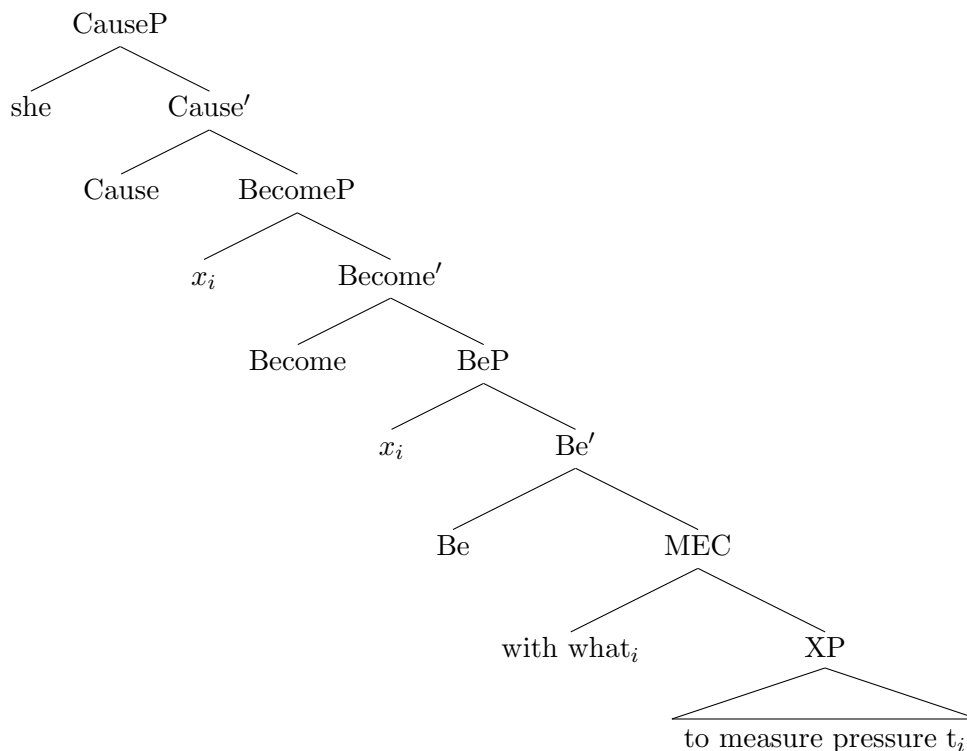
- I think that the third option is right. The style of decomposition given in (12) goes back to Dowty (1979) and has been adopted by many linguists working in different frameworks. The MOD part of BE shows that the result state can be (and typically is) further modified, possibly by a covert contextually determined state-modifier.³

- (12) a. BE (MOD)
 ↔ ‘be’ (in possession (i.e. ‘have’), available, present, visible, etc.)
- b. BECOME [BE (MOD)]
 ↔ ‘appear’, ‘arrive’, ‘be born’, etc.
- c. CAUSE [BECOME [BE (MOD)]]
 ↔ ‘give’, ‘buy’, ‘send’, ‘bring’, ‘build’, ‘look for’, ‘choose’, etc.

- The syntactic structure of something like (10b) is in (13):

(13) She built [_{MEC} with which to measure pressure].

³See e.g. Ramchand (2008) and the references cited therein.



4.2.2 Unattested distribution

- The requirement that MECs be always embedded under BE predicts their very strict distribution. This is borne out: they cannot appear in external-argument positions, (14), they cannot appear under verbs whose result state doesn't correspond to the existence/availability state, (15), they cannot appear in predicative positions, (16).

- (14) a. *Spanish* (Cristina Martí)
 *[MEC A quién preguntar] no nos ayudó.
 A who ask:INF NEG us helped
 'Somebody who one could ask didn't help us.'
- b. *Russian*
 *Maša { počinila / xotela } [MEC na čem igrat' v šaxmaty].
 Maša repaired / wanted on what:LOC play:INF in chess
 'Maša repaired / wanted something on which one can play chess.'
- (15) *Spanish* (Cristina Martí)
 */# Llamé [MEC a quién invitar].
 called:1SG A who invite:INF
 'I called somebody who I could invite.'
- (16) *Romanian* (Grosu 2004:428)
 *Săpunul ăsta este cu ce să te speli pe față.
 soap.the this is with what SBJ REFL.2SG wash on face
 'This piece of soap is something with which to wash your face.'

4.3 The object position

Two claims (contra all the previous literature on MECs):

1. the MEC itself is not in the object position
2. there is something else in the object position.

4.3.1 Spanish “headed” MECs

Main observations due to Plann (1980)

- (17a) includes something that looks like a headed infinitival relative at first sight, but it has a number of strange properties:

(17) Ana no { tiene / pudo encontrar } ningún libro que leer.
 Ana NEG has / could find any:NCI book that read:INF
 ‘Ana {doesn’t have / couldn’t find} any book to read.’

- It cannot appear in the subject position:

(18) Un libro (* que leer) ha llegado por correo.
 a book that read has arrived by mail
 ‘A book (to read) has arrived by mail.’

- The “head” must be non-specific:

(19) a. Ana no tiene ningún abrigo que ponerse.
 Ana NEG has any:NCI coat that put.on:REFL
 ‘Ana doesn’t have any coat to put on.’
 b. *Ana no tiene el abrigo que ponerse.
 Ana NEG has the coat that put.on:REFL
 ‘Ana doesn’t have the coat to put on.’
 c. *No tengo algo de que hablar.
 NEG have:1SG something:PPI of what speak:INF
 ‘I don’t have something (particular) about which I could speak.’

- The “head” does not intervene for extraction:

(20) a. ¿ Con quién ya no tienes (un sitio) dónde ir?
 with whom already NEG have:2SG (a place) where go:INF
 ‘Which person is such that there is no longer a place where you could go with that person?’
 b. ¿ Con quién ya no tienes (ningún libro) de qué hablar?
 with whom already NEG have:2SG (any:NCI book) of what speak:INF
 ‘Which person is such that there is no longer any book that you can speak about with that person?’

- Yet, the construction not only has possibility modality, (21a), but also necessity modality, (21b), (but only for some speakers; for some speakers, this is apparently unambiguously an MEC):

- (21) Ya no tengo ningún sitio dónde ir.
 already NEG have:1SG any:NPI place where go:INF
 a. ‘I no longer have a place where I could go.’
 b. ‘I no longer have a place where I have to go.’

- Perhaps, after all, the construction is just an infinitival relative? Or it is ambiguous?

- (22) a. [BeP ningún sitio [Be' tengo [PC dónde ir]]] = (21a)
 b. [BeP tengo [DP ningún sitio [RC dónde ir]]] = (21b)

- Infinitival relatives presumably don't allow extraction, unlike MECs. Prediction: Under extraction, the modality should only be possibility:

- (23) i Con quién ya no tienes ningún sitio dónde ir?
 with whom already NEG have:2SG any:NPI place where go:INF
 a. ‘Which person is such that there is no longer a place where you could go with that person?’
 b. *‘Which person is such that there is no longer a place where you have to go with that person?’

4.4 Purpose clause: the sibling of the MEC

The parallelism with purpose clauses provides further support to the proposed analysis

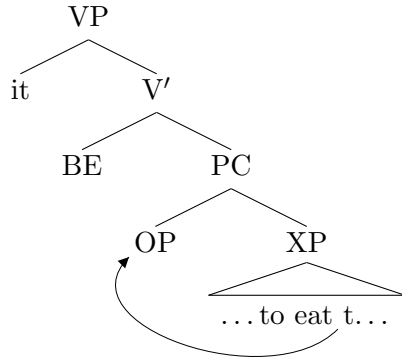
- MECs are structurally, distributionally, and semantically very close to English purpose clauses.

- (24) a. Mary has/bought it [PC to play chess on].
 b. *Mary repaired/wanted it to play chess on.
 c. Mary repaired/wanted it in order to play chess on it.
- (25) a. Carol bought **it** _{i} [PC OP _{i} to hang coats on t _{i}].
 (i) ‘People **can** hang coats on it.’
 (ii) *‘People **have to** hang coats on it.’
 b. **The wine** _{i} was brought [PC OP _{i} to enjoy t _{i} with food].
- (26) a. *Carol slapped her [PC to insult].
 b. *Carol drank it [PC to enjoy with food].

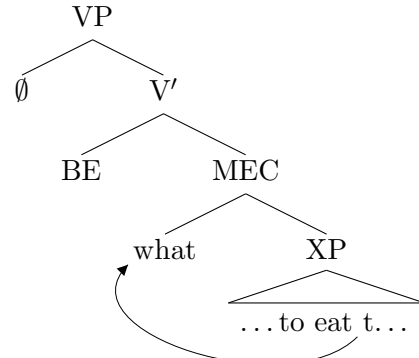
4.4.1 Structural affinity

- Purpose clauses constitute a mirror-image of MECs in terms of the lexicalization of the object/theme and the operator within the infinitival clause:

(27) It is available (for you) to eat.



(28) (There) is what to eat.



4.4.2 Scope

Both MECs and PCs have the lowest scope, corresponding to them being dependent on the low predicate BE; in MECs, this scope restriction also maps onto the scope of the existential quantification over the individual variable.

- Scope below negation

(29) *Serbo-Croatian*
 Jovan nema čto čitati.
 Jovan NEG:have:3SG what read:INF
 'Jovan doesn't have anything to read.'
 *'There is something such that Jovan cannot read it.'

- Scope below quantifiers

(30) *Bulgarian*
 Vseki ima kakvo da čete.
 everyone has what SBJ read:3SG
 'For everyone there is something that they can read.'
 *'There is something particular that everyone can read.'

- Scope below attitude predicates

(31) *Bulgarian*
 Ana vjarva če Ivan ima kakvo da čete.
 Ana believe:3SG that Ivan have:3SG what SBJ read:3SG
 'Ana believes that there is something that John can read.'
 *'There is something such that Ana believes that John can read it.'

- Purpose clauses: scope below negation

- (32) Jones (1991:59)
 John didn't leave her here (for us) [_{PC} to talk to].
 a. 'It is not the case that John left her here (for us) to talk to.'
 b. *'The reason John didn't leave her here was (for us) to talk to her.'

4.4.3 Mobility

Both MECs and PCs are immobile

- Passivization is allowed, but it can't target MEC/PC:

- (33) *Spanish*
 *_[MEC A quien consultar] no fue encontrado por Julia.
 A who consult:INF NEG was found by Julia
 'No one to consult was found by Julia.'
- (34) *Russian*
 a. Bylo kupleno [_{MEC čem zakusit'}].
 was bought what:INSTR eat.after.drinking.vodka:INF
 b. *_[MEC Čem zakusit'] bylo kupleno.
 what:INSTR eat.after.drinking.vodka:INF was bought
 'Something to eat after drinking vodka was bought.'

- This seems to suggest that there must be something that feeds the passivization (an empty object).
- Notice that the pattern in (34) is parallel to the one in purpose clauses:

- (35) a. It_i was bought [_{PC} OP_i to drink t_i during dinner].
 b. *(It_i) [_{PC} OP_i to drink t_i during dinner] was bought by John.

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