

Something (not so) new on scope marking: Interpretation and discourse function

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0. Goals and Objectives

- The talk has two objectives:
 - i. To provide an analysis of scope-marking *wh*-questions:

Claim: Scope marking *wh*-questions involve *indirect dependency* between embedded question and matrix *wh*-item (see Dayal, 1994, 2000, Lipták & Zimmermann 2007)
 - ii. To investigate the discourse-semantic nature of embedded foci & scope marking

Claims: Scope marking questions indicate a strategy in the D-tree: ***Q-restriction***

Embedded focus accents indicate the presence of strategies consisting of such restricted questions: recursive focus

⇒ A third way in which accenting languages can make formal reference to parts of D-trees, next to plain Q-A-strategies (indicated by matrix focus; Beaver & Clark 2008) and A-Q-Q'-strategies (indicated by CT-accenting, Büring 2003)

- *Structure of the talk*

PART I: Semantic interpretation of scope marking questions

1. Scope Marking Constructions: Properties and Previous Analyses
2. Argument pro indirect dependency: Scope marking into islands in Hungarian
3. Analysis: Generalized Question Formation

PART II: Discourse function of scope marking questions

4. Answer Patterns, Accenting and Discourse Trees
5. Scope Marking indicates Q-restriction strategy in the D-tree

PART I: Semantic interpretation of scope marking (Lipták & Zimmermann 2007)

1. Scope Marking: Properties and Previous Analyses

- *Scope marking constructions:*
 - i. Bi-clausal structures with *wh*-elements in matrix and embedded clause, respectively.
 - ii. Embedded *wh*-element appears to have matrix scope, somewhat parallel to long extraction; see paraphrase to (1) and (1A)
 - iii. Matrix-*wh* *seems* to act as a semantically vacuous placeholder element (= scope marker)
- (1) Q: **Was**₁ denkt Maria, [**wen**₁ Fritz t₁ eingeladen hat]?
what thinks Mary whom Fritz invited has
≈ 'Who does she think Fritz invited?'
- A: AN\na.

- iv. Attested in a range of unrelated languages, including German (van Riemsdijk 1983), Romani (McDaniel 1989), Hindi (Mahajan 1990), Hungarian (Horvath 1995); Russian and Polish (Stepanov 2000), and Pasamaquoddy (Bruening, 2006);

though not in English!

- (2) a. What do you think? Whom did Fritz invite?
b.*What do you think whom Fritz invited?

- *Characteristic Properties of scope marking questions*

- There is a scope marker *wh*-item in the superordinate clause.
- Any *wh*-item can occur in the embedded *wh*-position (*who, why, which concept, how many unripe coconuts*, etc).
- The answer given to a scope marking question specifies the embedded *wh*-item (1A)
- Scope marking can occur with multiply embedded clauses. In case of such transitive applications of scope marking, the scope markers are usually spelled out in every intermediate clause, as illustrated in (3):

- (3) (**Was**₁ denkt sie, [**was**₁ Hans gesagt hat, [**wen**₁ Fritz t₁ eingeladen hat]])?
'Who does she think Hans said Fritz invited?'

- v. The embedded clause hosting the content *wh*-item cannot be a selected question (matrix predicates like *ask* are not allowed), as in (4):

- (4) *Was fragt sie [_{<+w>} wen Hans eingeladen hat]
INTENDED: 'Who does she ask Fritz invited?'

⇒ Embedded *wh*-questions in scope marking are NOT complement clauses.

vi. *Scope marking questions can always be paraphrased as a paratactic sequence of matrix questions, with no change of interpretation:*

- (5) a. Was denkt Maria? Wen hat Fritz eingeladen? (= (1))
b. Was denkt Maria? Was hat Hans gesagt? Wen hat Fritz eingeladen? (= (3))

vii. *Scope marking questions typically occur with attitude verbs and verbs of saying.*

- (6) a. Was glaubt / denkt / weiß Maria, wen Fritz eingeladen hat?
b. Was rät / empfiehlt / möchte / will / schlägt Maria (vor), wen Fritz einladen soll?
c. Was sagt Maria (vorher), wer gewinnen wird?

- *Prosody*: Falling accent on matrix *wh*-items, default accent in embedded clause.

- (7) WAS\ denkt Maria, wen Fritz EIN\geladen hat?

- *Analyses of scope marking:*

- i. **Direct syntactic dependency** (van Riemsdijk 1983, McDaniel 1989, Cheng 2000, i.a.):

Embedded *wh*-item directly linked to matrix *wh*-item in the syntax and semantics, via LF-expletive replacement of the sort well-known from *there*-expletive constructions (Chomsky 1986)

- (8) surface: [CP1<+w> wh-scope marker ... [CP2<-w> wh-item [IP ...]]]
 LF: [CP1<+w> wh-item_i ... [CP2<-w> t_i [IP ...]]]

- (9) LF: **Wen₁** denkt Maria, [CP **t₁** Fritz t₁ eingeladen hat].

⇒ *Prediction:* Scope marking semantically equivalent to long *wh*-extraction.
 Not borne out!

- Presuppositions of scope marking and long extraction differ (Herburger 1994):

- (10) a. Was₁ glaubt Georg, wen₁ Rosa geküsst hat? #Wobei sie niemanden geküsst hat.
Factivity presupposition: kissing-event took place

- b. Wen₁ glaubt Georg, dass Rosa t₁ geküsst hat? Wobei sie niemanden geküsst hat.
No factivity presupposition

- Different scope interactions with higher quantifiers (Pafel 2000):

- (11) a. Was₁ glaubt jeder, wo₁ die besten Weine wachsen? only $\forall > wh$ (pair-list)
 b. Wo₁ glaubt jeder, dass die besten Weine t₁ wachsen? $\forall > wh$ & $wh > \forall$

- ii. **Indirect syntactic dependency** (Mahajan 1990, Fanselow and Mahajan 2000, Horvath 1995, 1997, 1998, 2000):

The entire embedded CP pied-pipes and adjoins to (or replaces) the expletive *wh*-item in the matrix clause at LF, see e.g. *Horvath on Hungarian:*

- (12) LF: [CP1 [CP2 [_{FocP} wh_i [IP2 ... t_i ...]]]_j-wh-expletive ... [IP1 ... t_j...]]
-

- iii. **Indirect semantic dependency** (Dayal 1994, 2000):

Matrix *wh*-element has semantic content: It introduces an existentially bound proposition variable to the interpretation of the matrix question (14b), which is restricted by a variable T ranging over sets of propositions (= question denotations)

Embedded interrogative clause: Denotes a set of propositions (Hamblin 1973, Karttunen 1977), providing the value for the restricting proposition-variable T (14c):

- (13) matrix-question: embedded question:
 $\lambda p. \exists q [\mathbf{T}(q) \ \& \ p = \lambda w. \dots q \dots]$ $[\lambda p. \exists x [\text{person}'(x) \ \& \ p = \lambda w. \dots x \dots]]$
-

- (14) a. **Was₁** denkt Maria, [**wen₁** Fritz t₁ eingeladen hat]?
- b. [[Was denkt Maria?]] = $\lambda p_{\langle s,t \rangle}. \exists q_{\langle s,t \rangle} [\mathbf{T}(q) \ \& \ p = \lambda w. \text{Mary thinks that } q \text{ in } w]$
- c. [[**wen₁** Fritz t₁ eingeladen hat?]]
= $\lambda p_{\langle s,t \rangle}. \exists x_{\langle e \rangle} [\mathbf{person}(x) \ \& \ p = \lambda w. \mathbf{Fritz invited } x \text{ in } w]$

- d. [[(14a)]] = $[\lambda \mathbf{T}_{\langle st,t \rangle}. \lambda p_{\langle s,t \rangle}. \exists q_{\langle s,t \rangle} [\mathbf{T}(q) \ \& \ p = \lambda w. \text{Mary thinks that } q \text{ in } w]]$
 $(\lambda p_{\langle s,t \rangle}. \exists x_{\langle e \rangle} [\mathbf{person}(x) \ \& \ p = \lambda w. \mathbf{Fritz invited } x \text{ in } w])$
- = $\lambda p_{\langle s,t \rangle}. \exists q_{\langle s,t \rangle} [[\lambda p_{\langle s,t \rangle}. \exists x_{\langle e \rangle} [\mathbf{person}(x) \ \& \ p = \lambda w. \mathbf{Fritz invited } x \text{ in } w]](q) \ \& \ p = \lambda w. \text{Mary thinks that } q \text{ in } w]$
- = $\lambda p_{\langle s,t \rangle}. \exists q_{\langle s,t \rangle} [\exists x_{\langle e \rangle} [\mathbf{person}(x) \ \& \ q = \lambda w. \mathbf{Fritz invited } x \text{ in } w] \ \& \ p = \lambda w. \text{Mary thinks that } q \text{ in } w]$
- ≈ Which proposition p of the form ‘Fritz is inviting somebody/x’ does Mary think to be true?

⇒ *Intuitive motivation:* Questions of the form ‘What does Mary think?’ are in need of overt restriction, as the domain of thoughts entertained by an individual is rather large...

- Questions
 - i. How do the meanings of matrix and embedded question compose, i.e. what triggers λ -abstraction over T in (12d)?
 - ii. Is there really no syntactic relation between matrix *wh*-element and embedded *wh*-question?

⇒ *A possibility:* Base adjunction of embedded CP to matrix-*wh* plus extraposition.

- (15) $[_{CP1} [_{wh} [wh] - t_i] \dots] \quad [_{CP2} wh_1 \dots t_1 \dots]_i$
|_____↑

2. Pro semantic dependency: Scope marking with adnominal adjunct clauses

- *Purpose of this section:*
 - i. Discuss standard instances of scope marking in Hungarian
 - ii. Introduce a new class of scope marking with adnominal adjunct clauses
- ⇒ Evidence for semantic dependency account of scope marking à la Dayal (1994, 2000)!

- *Standard scope marking in Hungarian:* Matrix + embedded question

- i. object clause:

- (16) Q: **Mit** szeretnél, [**hogy** *hova* utazzunk a nyáron]?
- what-ACC like-COND-2SG that where travel-SUBJ-3PL the summer-ON
(lit.) 'What would you like, where should we go in the summer?'

- A: Olaszországba.
Italy-INTO
'To Italy.'

ii. Subject *wh*-clauses (G: Was hat dich überrascht, wen Peter eingeladen hat?):

(17) Q: **Mi** zavarta Marit [**hogy kinek** telefonáltál]?
what-NOM bothered-3SG Mari-ACC that who-DAT phoned-2SG
(lit.) 'What bothered Mari that you phoned whom?'

A: Az, hogy Péternek.
that that Péter-DAT
'That I phoned Péter.'

(18) ('**Mi** zavarta Marit) pause (hogy `**kinek** telefonáltál) ?

iii. Adjunct *wh*-clauses:

(19) Q: **Miért** vagy dühös [mert *kivel* talákoztál]?
what-FOR be-2SG angry because who-WITH met-2SG
(lit.) 'Why are you angry because you met whom?'

A: Azért, mert Péterrel.
that-FOR because Péter-WITH
'Because I met Péter.'

⇒ Case marking on matrix *wh*-item indicates grammatical function of embedded clause.

⇒ Whether or not the answer to scope marking questions can be short (16A) or must be long (17A, 19A) depends on whether the embedded focus constituent in the answer can be overtly extracted or not.

⇒ (17A, 19A) display focus-phrase effects (Krifka 2006):

(20) Q: Whom did you invite? The man with the BLUE shirt, or the man with the RED shirt?
A: #RED
A: The man with the red shirt.

• Scope marking with adnominal adjuncts:

i. Scope marking with restrictive relative clauses:

(21) [Az]_i megy át a vizsgán [aki 20 pontot szerez]_i.
that go-3SG PV the exam-ON REL-who 20 point-ACC score-3SG
'The person who scores 20 points passes the exam.'

(22) [Az a diák]_i megy át a vizsgán [aki 20 pontot szerez]_i.
that the student go-3SG PV the exam-ON REL-who 20 point-ACC score-3SG
'The student who scores 20 points passes the exam.'

(23) Q: [**Ki**]_i megy át a vizsgán [aki *hány pontot* szerez]_i?
who go-3SG PV the exam-ON REL-who how.many point-ACC score-3SG
(lit.) 'Who_i, who_i scores how many points, passes the exam?'
≈ 'How many points does one have to score to pass the exam?'

A: [Az]_i [aki 20 pontot szerez]_i.
that REL-who 20 point-ACC score-3SG
'Who(ever) scores TWENTY.'

(24) Q: [Melyik diák]_i megy át a vizsgán [aki hány pontot szerez]_i?
 which student go-3SG PV the exam-ON REL-who how.many point-ACC score-3SG
 (lit.) 'Which student_i, who_i scores how many points, passes the exam?'
 ≈ 'How many points does a student have to score to pass the exam?'

A: [Az a diák]_i [aki 20 pontot szerez]_i.
 that the student REL-who 20 point-ACC score-3SG
 'Students that score TWENTY points.'

⇒ The constructions in (23) and (24) comply with the first five criteria that were identified as defining properties of scope marking: (i.) There is a scope marker (*ki*, *melyik diák*; property; (ii.) the choice of the embedded *wh*-phrase is free; (iii.) the question is answered by providing a specification for the embedded *wh*-item; (iv.) The relation can be employed transitively, i.e. it can involve multiple layers of embedding; (v.) the embedded relative clause is not a selected question:

(25) [Melyik diák]_i megy át a vizsgán, [aki [milyen könyvből]_j tanul
 which student go-3SG PV the exam-ON REL-who what book-FROM study-3SG
 [amit ki írt]_j]_i?
 REL-what-ACC who wrote-3SG
 (lit.) 'Which student_i, who_i studies from what kind of book_j, that_j who wrote, passes the exam?'

⇒ **An (at first) surprising restriction:** Matrix *wh*-item has to semantically match the relative pronoun, and not the embedded *wh*-item within the relative clause: The combination of number *wh*-item and individual relative pronoun in (26) is illicit.

(26) *[Hány diák]_i megy át a vizsgán [aki hány pontot szerez]_i?
 how.many student go-3SG PV the exam-ON REL-who how.many point-ACC get-3SG
 intended: 'How many students_i, who_i score how many points, pass the exam?'

ii. Scope marking with noun-associate clauses:

(27) Péter [azt az üzenetet]_i kapta [hogya rendőrségre kell mennie]_i;
 Péter that the message-ACC got-3SG that the police-TO need go-INF-3SG
 'Péter got a message that he has to go to the police force.'

(28) Q: [Milyen üzenetet]_i kapott Péter [hogy hova kell mennie]_i?
 what message-ACC got-3SG Péter that where need go-INF-3SG
 (lit.) 'What message, that he has to go where, did Péter get?'

A: Azt az üzenetet_i [hogya rendőrségre kell mennie]_i;
 that the message-ACC that the police-TO need go-INF-3SG
 'The message that he has to go to the police force.'

- Arguments against syntactic accounts of scope marking:
 - i. Against direct syntactic dependency: Embedded *wh*-item is located in a syntactic island and cannot extract to matrix clause (= scope marking with adjunct clauses, cf.19)

- ii. Against indirect syntactic dependency: Matrix *wh*-item is not a semantically empty expletive expression: *which student, which message*
- ⇒ *wh*-expression (or its *wh*-component) not replaced, but modified by embedded question clause.
- ⇒ pro indirect semantic dependency (Dayal 1994, 2000, Lipták & Zimmermann 2007)

- *Questions:*
- i. How is the meaning of scope marking questions derived compositionally (§3)?
 - What is the semantic effect of question marking in adjunct (because-), relative, and noun-associate clauses?
 - How does meaning of embedded interrogatives modify the matrix *wh*-expression?
- ii. What is the discourse-semantic import of scope marking questions (Part II)

3. Semantic analysis of scope marking: Generalized question formation

- *Main goal:*
Extending Dayal's account to scope marking with relatives and noun-associates
- *Basic Assumptions:*
- i. Syntactically, the embedded *wh*-(relative/associate) clause starts out as the syntactic sister of the matrix *wh*-expression, from where it is extraposed
- ⇒ see Lipták & Zimmermann (2007) for empirical arguments from binding and discussion
- ii. *wh*-items denote (restricted) variables (e.g. Jacobson 1995, Sternefeld 2001, i.a.)
- iii. Semantic question formation is triggered by Q-operator in C-domain: Q-operator maps open propositional arguments ($\langle s, t \rangle$) into sets of propositions ($\langle st, t \rangle$) (via an intermediate step of λ -abstracting over the *wh*-position; see eg. Reinhart 1997):

- *Two generalizations (see Sternefeld 2001, 2002):*
- i. Matrix *wh*-item can denote (set) variables of different kinds:

standard <i>what</i> -scope marking:	proposition ($\langle s, t \rangle$)	(Dayal 2000)
<i>why</i> -scope marking:	set of propositions ($\langle st, t \rangle$)	(Sternefeld 2001, 2002)
who/which-NP:	individual properties ($\langle et \rangle$)	
how many-NPs:	degree properties ($\langle d, t \rangle$)	
- ii. Question formation can target sentential objects of variable semantic kind, but denoting into $\langle \dots, t \rangle!$, resulting in λ -abstraction over the relevant *wh*-position:

<i>wh</i> -clauses:	open propositions	($\langle t \rangle$)	(Dayal 2000)
<i>wh-because</i> -clauses:	open sets of propositions	($\langle st, t \rangle$)	(Sternefeld 2000, 2001)
<i>wh</i> -relatives:	open individual properties	($\langle et \rangle$)	
	open degree properties	($\langle d, t \rangle$)	

(29) Generalized Question Formation:

a. $[[Q]] ([[\phi]] \in \mathbf{D}_\tau) = [[Q\phi]] \in \mathbf{D}_{\langle \tau, t \rangle}$

b. $[[Q]] = \lambda P \in \mathbf{D}_{\langle \tau, \langle \sigma \tau \rangle} . \lambda Q \in \mathbf{D}_{\langle \sigma \tau \rangle} . \exists x \in \mathbf{D}_\tau [Q = P(x)]$

(30) a. $[[Q_i]] ([[Who_i \text{ won ?}]] =$

b. $[\lambda P \in \mathbf{D}_{\langle e, \langle st \rangle} . \lambda p \in \mathbf{D}_{\langle st \rangle} . \exists x \in \mathbf{D}_e [p = P(x)]] (\lambda x \in \mathbf{D}_e . \lambda w . x \text{ won in } w)$

c. $\lambda p \in \mathbf{D}_{\langle st \rangle} . \exists x \in \mathbf{D}_e [p = \lambda w . x \text{ won in } w]$

⇒ Availability of generalized question formation restricted by syntactic factors:

Presence of an articulated left periphery with a split CP, which can host both a relative operator (triggering λ -abstraction over relativized position) AND a question operator (triggering λ -abstraction over wh-position and generalized question formation):

Hungarian, Frisian, Slovenian: ✓ vs. German: NO!

3.1 Sample analysis: Scope marking with relative clauses.

(24) Q: [Melyik diák]_i megy át a vizsgán [aki hány pontot szerez]_i?
 which student go-3SG PV the exam-ON REL-who how.many point-ACC score-3SG
 (lit.) 'Which student_i, who_i scores how many points, passes the exam?'
 ≈ 'How many points does a student have to score to pass the exam?'

- Indirect scope marking with wh-questions:

i. matrix-wh what : ranges over propositions (type $\langle s, t \rangle$)

ii. embedded question: denotes a set of propositions that restricts the matrix question ($\langle st, t \rangle$)

- Indirect scope marking with wh-relatives:

i. matrix-wh what : ranges over properties (type $\langle e, t \rangle, \langle d, t \rangle$)

ii. wh-relative: denotes a set of individual or degree properties that restricts the matrix question ($\langle et, t \rangle, \langle dt, t \rangle$)

• Step 1 - Semantic interpretation of wh-relative: Generalized question formation

(31) [_{wh-RC} aki hány_i pontot szerez]
 REL-who how.many point-ACC score-3SG

(32) a. $[[aki hány_i \text{ pontot szerez}]] = \lambda x . x \text{ scored } n \text{ points}$

b. $\Rightarrow \lambda n . \lambda x . x \text{ scores } n \text{ points}$ (after λ -abstraction over n , triggered by Q_{RC} 's index)

c. $[[Q_{RC}]] = \lambda R_{\langle d, et \rangle} \lambda P_{\langle et \rangle} . \exists n \in \mathbf{D}_d [P = R(n)]$

d. $[[Q_i \text{ aki hány}_i \text{ pontot szerez}]] = \lambda P_{\langle et \rangle} . \exists n \in \mathbf{D}_d [P = [\lambda n . \lambda x . x \text{ scores } n\text{-many points}](n)]$
 $= \lambda P_{\langle et \rangle} . \exists n \in \mathbf{D}_d [P = \lambda x . x \text{ scores } n\text{-many points}]$ (type: $\langle et, t \rangle$)

≈ the set of properties of x having n -many points, with $n \in \mathbf{N}$

- **Step 2 - Semantic interpretation of matrix question: Type coercion**

Problem: *Type mismatch between wh-RC and matrix-wh*

The embedded wh-RC can serve as a restriction to semantic objects of type $\langle et \rangle$ (individual properties), which may be the semantic type of the bare wh-item *ki* 'who', but not of *which*-NPs, which typically denote into $\langle e \rangle$.

\Rightarrow *Type coercion of which-NP to type $\langle e, t \rangle$*

(33) $[[\text{melyik diák}]] = \text{student}(x) \Rightarrow \text{student}(x) \ \& \ \mathbf{P}_{\text{wh}}(x)$

\Rightarrow Which/How many NPs in scope marking questions ask for properties of individuals or degrees (= *what kind of*)

(34) a. $[[\text{melyik diák megy át a vizsgán}]]$
 $= \exists x [\text{student}(x) \ \& \ P(x) \ \& \ x \text{ passes exam}] \quad [\text{VP+which-NP, ECx}]$
 b. $[[Q_i \text{ melyik}_i \text{ diák megy át a vizsgán? }]]$
 $= \lambda p. \exists \mathbf{P} \in \mathbf{D}_{\text{et}} [\wp(\mathbf{P}) \ \& \ p = \lambda w. \exists x [\text{student}(x) \ \& \ \mathbf{P}(x) \ \& \ x \text{ passes exam in } w]]$
 [Q-abstraction over P, QF, covert \exists -restriction]

- **Step 3 – Combining matrix question and embedded wh-RC:**

(35) $[[\text{Melyik diák megy át a vizsgán [aki hány pontot szerez?]}]]$
 $= [\lambda \wp_{\langle \text{ett} \rangle}. \lambda p. \exists \mathbf{P} \in \mathbf{D}_{\text{et}} [\wp(\mathbf{P}) \ \& \ p = \lambda w. \exists x [\text{student}(x) \ \& \ \mathbf{P}(x) \ \& \ x \text{ passes exam in } w]]]$
 $(\lambda \mathbf{P}_{\langle \text{et} \rangle}. \exists n \in \mathbf{D}_d [\mathbf{P} = \lambda x. x \text{ scores } n\text{-many points}])$
 $= \lambda p. \exists \mathbf{P} \in \mathbf{D}_{\text{et}} [\exists n \in \mathbf{D}_d [\mathbf{P} = \lambda x. x \text{ scores } n\text{-many points}] \ \& \ p = \lambda w. \exists x [\text{student}(x) \ \& \ \mathbf{P}(x) \ \& \ x \text{ passes the exam in } w]]]$
 $=$ the set of propositions p such that a student with the P -property passes the exam and P is the individual property of scoring n -many points.
 \approx Students of what kind in the n -point scoring domain will pass the exam?

NB1: The sequence of existential quantifiers ($\exists \mathbf{P}, \exists n$) gives scope marking questions the flavor of a (layered) double question (see below).

NB2: A more local semantic composition of *wh*-NP and *wh*-RC is possible in principle; see Lipták & Zimmermann (2007: §4.4) for details

3.2 Extensions and the matching constraint on matrix-wh and REL

- Extension to noun-associate clauses

(28) Q: $[\text{Milyen üzenetet}]_i$ kapott Péter $[\text{hogy hova kell mennie}]_j$?
 what message-ACC got-3SG Péter that where need go-INF-3SG
 (lit.) 'What message, that he has to go where, did Péter get?'
 A: Azt az üzenetet_i $[\text{hogy a rendőrségre kell mennie}]_j$
 that the message-ACC that the police-TO need go-INF-3SG
 'The message that he has to go to the police force.'

- ⇒ Matrix *wh*- and relativization must operate on the same semantic domain
- ⇒ Matrix *wh*- and embedded *wh*-need not operate on the same semantic domain

Domain of matrix <i>wh</i>	Domain of REL	Domain embedded <i>wh</i>
<i>grammatical cases</i>		
individual (who, which N, etc.)	individual	individual
individual	individual	degree
degree (how many/much)	degree	individual
degree	degree	degree
<i>ungrammatical cases</i>		
degree	individual	individual
degree	individual	degree
individual (who, which N)	degree	individual
individual	degree	degree

- (26) ***[Hány diák]_i** megy át a vizsgán [**aki** *hány pontot* szerez]_i?
 how.many student go-3SG PV the exam-ON REL-who how.many point-ACC get-3SG
 intended: 'How many students_i, who_i score how many points, pass the exam?'

• **Conclusions:**

- i. Scope marking questions are best analyzed as instantiating a semantic dependency between matrix *wh* and embedded *wh*-clause.
- ii. Scope marking questions ARE literally questions about the matrix *wh*-item
- iii. The function of the embedded *wh*-clause is to restrict the range of possible values for the matrix variable, by narrowing down the answer space.

PART II: Discourse- function of embedded focus and scope marking

• **Questions:**

- i. Do scope-marking questions do more than simple *wh*-questions (with or without long extraction) from a discourse-semantic perspective? **YES!**
 - ii. How do scope marking questions differ from simple questions, on the one hand, and from multiple questions, on the other?
- ⇒ General claim: Scope marking is a grammaticalized strategy for simultaneously asking two (or more) questions from different layers in a D-tree (Roberts 1996, Büring 2003)

4. Answer Patterns, Accenting, and D-Trees

• **Core claims:**

- i. Next to CT-marking (Büring 2003), there is at least one other way for declarative sentences to indicate strategies consisting of more than one question.

ii. There are two ways for a question Q to be an informative sub-question to a higher question Q':

- $[[Q]]^0 \in [[Q']]^0$ question selection (Büring 2003, CT-marking)
- $[[Q]]^0 \subset [[Q']]^0$ question restriction

• **Observations A: Answers to scope marking questions**

i. Even short answers to scope marking questions are not answers to the embedded question: Matrix environment always plays a role

(1) Q: **Was**₁ denkt Maria, [**wen**₁ Fritz t₁ eingeladen hat]?
 what thinks Mary whom Fritz invited has
 ≈ 'Who does she think Fritz invited?'

A: AN\na.

(16) Q: **Mit** szeretnél, [**hogy** *hova* utazzunk a nyáron]?
 what-ACC like-COND-2SG that where travel-SUBJ-3PL the summer-ON
 (lit.) 'What would you like, where should we go in the summer?'

A: Olaszországba.
 Italy-INTO
 'To Italy.'

ii. Focus-phrase answers to scope marking questions in which the embedded focused answer cannot extract for syntactic reasons (Lipták & Zimmermann 2007) denote a semantic object corresponding to the matrix *wh*-item: Matrix environment plays a role

(17) Q: **Mi** zavarta Marit [**hogy** *kinek* telefonáltál]?
 what-NOM bothered-3SG Mari-ACC that who-DAT phoned-2SG
 (lit.) 'What bothered Mari that you phoned whom?'

A: Az, **hogy** Péternek.
 that that Péter-DAT
 'That I phoned Péter.'

⇒ Answers to scope marking questions relate to two questions

⇒ Proposition 'that I phoned Peter' answers matrix question: 'What bothered Mary?'

⇒ Focused embedded item answers embedded question: Whom did you phone?

iii. The same is observed with typical instances of focus phrases (Krifka 2006):

(39) Maria mag [den Freund, den ROBERT mitgebracht hat]_{FocP} und nicht [den Freund, den PAUL mitgebracht hat]_{FocP}.

Q1: Wen mag Maria?

Q2: Mag sie den Freund den ROBERT oder den PAUL mitgebracht hat?

(Q1+Q2): Wen ({FR, FP}) mag Maria

• **Observations B: Foci, C-Topics and D-Trees**

i. Focus marking in declaratives indicates the (implicit) QUD (Roberts 1996, Büring 2003, Beaver & Clark 2008).

(40) Fred ate the BEANS_F.

QUD: What did Fred eat?

(41) **Focus congruence:**

FOC in A indicates a strategy in D iff **there is a question Q** such that $[[Q]]^0 = [[A]]^F$

ii. Contrastive topic (CT)-marking points to a discourse strategy consisting of at least two hierarchically layered *wh*-questions (QUDs + super-question Q') (Büring 2003). Sentence provides an exhaustive answer to QUD **plus** a partial answer to Q'

(42) Any subtree of a D-tree which is rooted in a question is a *strategy*. (Büring 2003)

(43) FRED/_{CT} ate the BEANS_F.

Q':
Who ate what?
QUD: What did *Paul* eat? **What did Fred eat?** What did *Mary* eat?
A: Fred/ ate the beans\.

(ii) **CT-congruence:**

CT in A indicates a strategy in D iff there is a set Q' of questions (denoted by the multiple question; MZ) such that **for each Q ∈ Q'**, (i.) Q is identical to, or a sister of the question that immediately dominates A, and (ii.) $[[Q]]^0 ∈ [[A]]^{CT}$ (Büring 2003)

iii. Multiple focus marking in a simple matrix declarative indicates the existence of multiple QUDs (possibly at the same D-tree level):

(44) FRED_F ate the BEANS_F.

QUD: Who ate something? What was eaten?

iv. Embedded focus marking e.g. in complement clauses and conditionals indicate the existence of two or more QUDs at different levels of the D-tree, in which the QUD marked by the embedded focus restricts a Q at a higher level: *local questions* (Beaver 2012): Sentences with embedded foci relate to two QUDs at the same time.

(45) Maria believes that FRED_F ate the beans.

#QUD: Who ate the beans?

QUD1: What does Mary believe?

QUD2: Who ate the beans?

(QUD1+2): What (who ate the beans?) does Mary believe?

(46) Mary will be pleased if FRED_F ate the beans.

#QUD: Who ate the beans?

QUD1: Under which conditions will Mary be pleased?

QUD2: Who ate the beans?

(QUD1+2): Under what conditions (who ate the beans?) will Mary be pleased?

⇒ All these cases arguably differ from the next two, in which focus marking in non-at issue appositions (Onéa 2012), or postposing to Nachfeld seem to relate to dynamically accommodated, local QUDs,

and in which the dynamic QUD does not provide a partial answer to the global QUD.

(47) Buzz Aldrin, the SECOND man on the MOON, lives in Southern California.

QUD: Where does A. live? QUD_{APP}: Was A the first, second,... man on moon?

(48) (Ich habe **ihn** dann mit nach Hause genommen, **den kleinen Hund**)_{ip}.

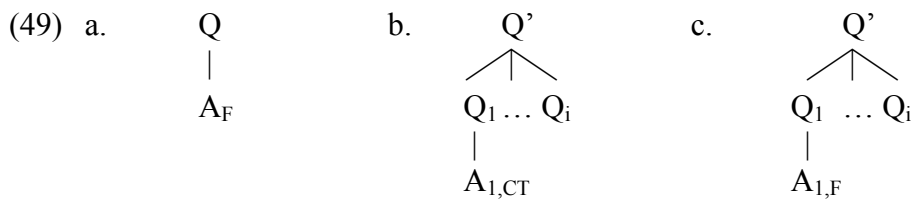
QUD: What did you do with g(x)? What happened then?

QUD_{new}: What is the referent of 'x'?

• **Summary: Focus Marking and D-tree Strategies**

In addition, to the two D-tree strategies that are commonly taken to be indicated by focus and CT-accenting (49ab),

there is a third strategy indicated by embedded foci in complex clauses (49c):

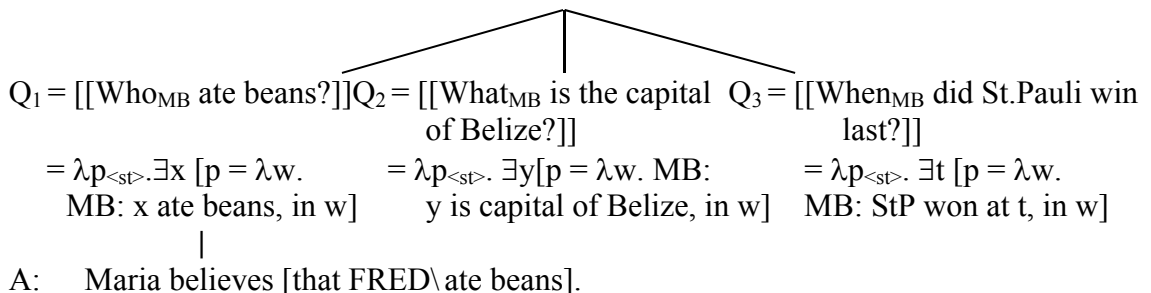


(50) **Embedded focus-congruence:**

Embedded focus in a complex clause A indicates a strategy in D iff there is an (unspecific) question Q' and a (more specific) question Q, such that $Q \subset Q'$, and $[[Q]]^0 = [[A]]^F$, and $[[A]]^F \subset [[Q']]^0$.

(51) a. Maria believes that FRED_F ate beans.

b. $Q' = [[\text{What does Maria believe?}]]$
 $= \lambda p. \exists q \in D_{\langle st \rangle} [p = \lambda w. \text{believe}'(m, q, w)]$



⇒ Embedded foci point to the existence of complex Q-Q'-strategies in the D-tree

⇒ Q and Q' in the embedded focus-strategy stand in the subset-relation, rather than in the element-of relation found with CT-marking

⇒ Embedded foci point to the existence of local questions (Beaver 2012), which restrict an unspecific higher question Q'

⇒ The congruence rule for embedded foci in the discourse-semantic D-tree framework does not make reference to the syntactic domain identified as focus phrase in Krifka (2006): Reference to alternative projection may be sufficient in a dynamic discourse-semantic framework of questions and focus.

5. Indirect Scope Marking: Expressing Hierarchically Layered Questions

- *Claims:*

i. Scope marking questions are the grammaticalized expression of a D-tree strategy consisting of an unspecific question Q', **and a restricting sub-question Q!**

(1) **Was** denkt Maria, [**wen** Fritz t₁ eingeladen hat]?

Q' = What does Maria think?

Q = Whom_{MT} did Fritz invite?

(52) Was glaubt Maria [wer Bohnen gegessen hat]?

Q' = What does Mary believe?

Q = Who_{MB} ate beans?

ii. The static compositional derivation in §3, in which the embedded question Q restricts the matrix question Q', directly reflects the relation of Q and Q' in the D-tree.

- *Predictions:*

i. Sentences with embedded foci can answer scope marking questions:

(1) A'. Maria denkt, dass Fritz GÜN\ther eingeladen hat.

(52) A'. Maria glaubt, dass PE\ter Bohnen gegessen hat.

ii. The distribution of embedded foci is more widespread than scope marking, which is restricted by structural syntactic factors: D-trees and focus accenting are not

scope marking ⇒ embedded foci; *embedded foci ⇒ scope marking

iii. Scope marking questions in German can always be replaced by sequences of independent questions:

(1') Q': Was glaubt Maria? Q: Wen hat Fritz eingeladen?

iv. As Q and Q' form a strategy, Q must be informative relative to Q' (Büring 2003).

⇒ Scope marking should be infelicitous in contexts in which attitude holder only holds beliefs concerning one particular aspect of the world; cf. (53) vs (54):

(53) Was bedauert Maria was sie gekauft hat.

(54) Maria bedauert nur eine einzige Sache. Was bedauert Maria (# was sie gekauft hat)?

v. Since scope marking questions and embedded foci indicate different strategies in the D-tree, both processes can interact with CT-marking:

- (55) Q: Was glaubt Ma/Ri_{CT}, wen Fritz EIN\geladen hat?
 A: Ma/Ri_{CT} glaubt, dass Fritz Gün\ther_F eingeladen hat.
- Q[‘]: **Who believes what?**
 Q[‘]: **What does Maria believe?**, What does Paul believe? Etc.
 Q: **Whom_{MB} did Fritz invite?**, Whom_{MB} did Peter invite?, etc.
 A: **Ma/Ri_{CT} glaubt, dass Fritz Gün\ther_F eingeladen hat.**

6. Conclusions

- i. From a discourse perspective, scope marking constructions are a grammaticalized way of indicating a particular strategy in a D-tree: Restricted super-questions.
- ii. The semantic dependency account of scope marking reflects this in a transparent way.
- iii. Availability of scope marking questions in a language depends on structural and diachronic factors.

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