**Questions, Answers and the Structuring of Information:** 

III: Questions, Answers and Focus in Commitment Space Semantics

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# III: Questions, Answers and Focus in Commitment Space Semantics

Day 3: A theory of assertions and questions couched in a novel framework for speech acts. Assertions as public vouches for truth of propositions, questions as requests to the addressee to vouch for truth of certain propositions. This allows for a natural way to account for biased questions, and for focus in questions. We also will look at question tags as combinations of assertions and questions. The talk is based on Krifka 2015.

Slides can be downloaded from:

- http://www.zas.gwz-berlin.de/180.html
- or <u>http://www.zas.gwz-berlin.de/mitarbeiter\_krifka.html</u>, go to "Vorträge" or "Talks"

<sup>&</sup>lt;sup>+</sup> Krifka, Manfred. 2015. Bias in Commitment Space Semantics: Declarative questions, negated questions, and question tags. *SALT* 25. LSA Open Journal Systems, 328-345.

# **1 Dynamic Semantics and Speech Acts**

Szabolcsi, Anna. 1982. "Model theoretic semantics of performatives."

- Against performative utterances as propositions (Generative Semantics), against separating semantics (truth-conditionals) from pragmatics (language games)
- Difference between constatives (descriptives) and performatives:
  - describing some state of affairs leaves the state of affairs untouched
  - performatives change the state of affairs: dynamic transition from one to another.

e.g. i + I miss you. = i',

where i' like i except that in i', sp(i) has declared that sp(i) misses addr(i) in i i + *I* congratulate you! = i',

- where i' like i except that in i', sp(i) has congratulated addr(i)
- Speech acts have a semantic type: (s, s), allowing for semantic operators: e.g. Frankly, I miss you.: ... in i', sp(i) has declared in an honest way ...

Worked-out proposal: Krifka, Manfred. 2014. "Embedding illocutionary acts."

• Transition operator: i' $\rightarrow$ i [ $\phi$ [i]]  $\Leftrightarrow_{def}$  i' precedes i immediately  $\land \neg \phi$ [i']  $\land \phi$ [i]  $\land$ 

for all  $\psi$  logically independent from  $\phi$ :  $\psi[i'] \leftrightarrow \psi[i]$ 

Here:

- A particular implementation of this proposal, cf. Krifka 2015,
- concentrating on assertions and questions.

Dynamic Semantics and Speech Acts

# 2 A Framework for Illocutionary Acts

#### 2.1 Commitment States (CSt)

Basic assumptions:

- Illocutionary acts change commitments of interlocutors
- Commitments are represented as propositions
- Commitments accrue during conversation in Commitment States (CSt) modeled as sets of propositions

Update of commitment state c with speech act  $\mathfrak{A}_{\scriptscriptstyle \phi}$  :

(1) 
$$c + \mathfrak{A}_{\phi} = c \cup \{\phi\},\$$

where  $\varphi$ : the commitment introduced by speech act  $\mathfrak{A}_{\varphi}$ .

Requirements for update of commitment states:

- The proposition φ should not be entailed by c (redundancy; but: increase of saliency, not modeled here)
- The proposition φ should be consistent with c, no blatant inconsistencies with salient propositions in c.



Figure 1: Update of commitment state

# 2.2 Commitment Spaces (CSp)

Common Ground development (Krifka 2008):

- CG content
- CG management: Intended continuations of CG

#### Notion of Commitment Space (CSp):

- (2) C is a CSp iff C is a set of commitment states, with  $\cap C \neq \emptyset$  and  $\cap C \in C$
- We call  $\cap C$  the **root** of C, and write  $\sqrt{C}$ .
- √C is the set of propositions
   Figure that participants have accepted to the common ground.
   Update of C with speech act 𝔄<sub>m</sub>:

(3) 
$$C + \mathfrak{A} = \{c \in C \mid \sqrt{C} + \mathfrak{A}_{\varphi} \subseteq c\}$$

(4)  $C + \mathfrak{A}^{S} = C + {}^{S}\mathfrak{A} = \langle C + \mathfrak{A}, S \rangle = [C + \mathfrak{A}]^{S}$ , where S: the person that performs the speech act.

If actor is currently of no concern: Use of wild card, \*

(5) 
$$C +^* \mathfrak{A} = [C + \mathfrak{A}]^*$$

A Framework for Illocutionary Acts: Commitment Spaces (CSp)

## 2.3 Boolean Operations: Denegation

Why Commitment Spaces? Boolean Operations:

- Negation
- Conjunction
- Disjunction

#### Modeling of denegation by complementation:

(6) I don't promise to come. (≠ I promise not to come.)

Update of a commitment space with denegation of  $\mathfrak{A}$ :

(7) 
$$C +^{s} \sim \mathfrak{A} = [C - [C + \mathfrak{A}]]^{s}$$
  
Notice:

- Denegation is dynamic negation on Commitment Spaces
- Denegation does not change the root, no effect on the propositions that the interlocutors are committed to.
- But denegation has an effect about the possible future development of conversation: in (monotonic) updates, update with C + 𝔅 is excluded
- Cohen & Krifka 2014 call such updates meta speech act.



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Figure 3: Update with  $\mathfrak{A}_{\phi}$ , with  $\mathfrak{A}_{\neg\phi}$ , and with denegation  $\sim \mathfrak{A}_{\phi}$ 

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#### 2.4 Boolean Operations: Conjunction

#### Modeling of conjunction by intersection:

(8)  $C +^{s} [\mathfrak{A} \& \mathfrak{B}]$ =  $[[C + \mathfrak{A}] \cap [C + \mathfrak{B}]]^{s}$ 

Always results in a rooted set of commitment states (a Commitment Space)

Speech acts generally can be conjoined (cf. Krifka 2001 for quantification and conjunction of questions).

Conjunction of Commitment Spaces has a similar impact as sequential update:



Figure 4: Conjunction of regular and meta speech acts

- (9)  $C + {}^{s} [\mathfrak{A} \& \mathfrak{B}] \approx [[C + \mathfrak{A}]^{s} + \mathfrak{B}]^{s} \approx [[C + \mathfrak{B}]^{s} + \mathfrak{A}]^{s}$ conjunction sequ. update sequ. update
- See below for sequential update.
- Anaphoric bindings from first to second conjunct possible with sequential update
- Sequential update might be a cognitively simpler operation, and hence preferred over intersection of commitment spaces.

A Framework for Illocutionary Acts: Boolean Operations: Conjunction

#### 2.5 Boolean Operations: Disjunction

#### Modeling of disjunction by union.

(10) C +<sup>s</sup>  $[\mathfrak{A} \lor \mathfrak{B}]$ =  $[[C + \mathfrak{A}] \cup [C + \mathfrak{B}]]^{s}$ 

Notice:

- Results in a proper CSp only for meta speech acts.
- Speech acts cannot in general be disjoined.
- Intuitive reason: It is unclear what the speaker has committed to.
- Cf. disjunction of assertions: Gärtner & Michaelis 2010.

Fixing non-rooted commitment spaces:

- If a speech-act operation results in a non-rooted set of commitment spaces C, add a commitment state c such that C ∪ {c} is a (rooted) commitment space, such that a proposition p follows from C iff p follows from C∪c
- Here:  $c = \sqrt{C} \cup \{\phi \lor \psi\}$

Figure 5: Disjunction of regular and meta speech acts



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Figure 6: Fixing disjunction

A Framework for Illocutionary Acts: Boolean Operations: Disjunction

## 2.6 Commitment Space Developments (CSD)

Record of the history of the update by a sequence:

(11)  $\langle C^*_0, C^*_1, \dots C^*_n \rangle$ , where  $C^*_n$ : the current CSp

Update of a commitment space development:

(12)  $\langle ..., C^* \rangle$  +<sup>S</sup>  $\mathfrak{A}$  =  $\langle ..., C^*, [C+\mathfrak{A}]^S \rangle$ 

- Complete record of the conversation
- Corresponds to Szabolcsi's idea of speech acts as world changers
- And speakers can refer back to order in conversation (As I said at the beginning...)

**Rejection** of last update by rejection operation  $\Re$  (cf. negotiable "table" in Farkas & Bruce 2010):

(13)  $\langle ..., C^*, C'^* \rangle$  +<sup>S</sup>  $\Re$  =  $\langle ..., C^*, C^* \rangle$ , return to next to last CSp, actor: S

Updates as functional applications for CSt, CSp and CSDs:

A Framework for Illocutionary Acts: Commitment Space Developments (CSD)

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# Interlude: Peirce on the nature of assertions

Charles Sanders Peirce, "Judgement and Assertion", ca. 1908, CP 5.546-548.\*

If a man desires to assert anything very solemnly, he takes such steps as will enable him to go before a magistrate or notary and take a binding oath to it.

Taking an oath is not mainly an event of the nature of a setting forth, *Vorstellung*, or representing. It is not mere saying, but is doing. The law, I believe, calls it an "act".

At any rate, it would be followed by very real effects, in case the substance of what is asserted should be proved untrue.

This ingredient, the assuming of responsibility, which is so prominent in solemn assertion, must be present in every genuine assertion.

For clearly, every assertion involves an effort

to make the intended interpreter believe what is asserted, to which end a reason for believing it must be furnished.

But if a lie would not endanger the esteem in which the utterer was held, nor otherwise be apt to entail such real effects as he would avoid, the interpreter would have no reason to believe the assertion.



<sup>\*</sup> cf. Tuzet, Giovanni. 2006. Responsible for Truth? Peirce on judgement and assertion. Cognitio 7: 317-336.

A Framework for Illocutionary Acts: Commitment Space Developments (CSD)

# **3 Assertions**

#### 3.1 Assertions as commitments

Proposal: By asserting a proposition,

speaker makes a **public commitment for the truth of that proposition** (cf. Peirce ca. 1908, Brandom 1983, McFarlane 2011).

(15)  $S \vdash \phi$  'S is publicly committed to / vouches for the truth of  $\phi$ '

Alternative: S wants that addressee believes  $\phi$  (Bach & Harnish 1979, Zaefferer 2001). Problems with this proposal (cf. Searle 2001, Gärtner 2012):

(16) a. {Believe it or not / I don't care whether you believe it, but} I won the race. b. Overheard private conversation: It's good that no-one knows I won the race.

But then how does A come to believe  $\varphi$  in typical cases?

- By committing to a proposition φ, S gives addressee a reason to believe φ.
- Reason: Committing to false propositions: Social sanctions, which S tries to avoid.

As the intention that addressee believes the proposition is cancelable, cf. (16) this is a **conversational implicature**.

Double effect of assrtion:

Assertions: Assertions as commitments

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## 3.2 Syntactic structure of assertions

Assertions involve the following projections:

- Asserted proposition: **TP**, **Tense Phrase**
- Proposition expressing commitment: CmP, Commitment Phrase
- ◆ Application to CSD (speech act): ActP, Illocutionary Act Phrase

Following principles of X-bar-syntax

(possible rasing of finite verb / subject to CmP, ActP, not indicated here)

Compositional interpretation by function [[ ]] $^{S_1S_2}$ , where  $S_1$ : Speaker,  $S_2$ : Addressee

 $\begin{aligned} &(19) \left[ \left[_{Act^{p}} \left[ \left[_{Act^{o}} \cdot \right] \right]_{Cm^{p}} \left[ \left[_{Cm^{o}} \leftarrow \right] \right]_{TP} I \text{ won the race} \right] \right] \right] \right] \mathbb{I}^{S_{1}S_{2}} \\ &= \left[ \left[_{Act^{o}} \cdot \right] \right]^{S_{1}S_{2}} \left( \left[ \left[_{Cm^{o}} \leftarrow \right] \right]^{S_{1}S_{2}} \left( \left[ \left[_{TP} I \text{ won the race} \right] \right] \right]^{S_{1}S_{2}} \right) \\ &= \left[ \left[_{Act^{o}} \cdot \right] \right]^{S_{1}S_{2}} \left( \left[ \left[_{Cm^{o}} \leftarrow \right] \right]^{S_{1}S_{2}} \left( \left[ \left[_{TP} I \text{ won the race} \right] \right]^{S_{1}S_{2}} \right) \right) \\ &\text{with} \quad \left[ \left[_{TP} I \text{ won the race} \right] \right]^{S_{1}S_{2}} = \left( S_{1} \text{ won the race} \right) \\ &= \left[ \left[_{Cm^{o}} \leftarrow \right] \right]^{S_{1}S_{2}} = \lambda p \lambda S [S \leftarrow p] \\ &= \left( Act^{o} \cdot \right)^{S_{1}S_{2}} = \lambda R \lambda C^{*} [C + R(S_{1})]^{S_{1}} \\ &= \lambda C^{*} [C + S_{1} \leftarrow (S_{1} \text{ won the race}]^{S_{1}} \end{aligned}$ 

A function that updates the last CSp of a CSD, and adds it to the last element.

#### 3.3 Reactions to assertion

Assertions have two effects:

- Conventional: Adding speaker's commitment to proposition
- Conversational implicature: Adding proposition itself
- $\begin{array}{ll} \text{(20)} & \langle ..., \, C^{\star} \rangle + ^{S_1} S_1 \vdash \phi \ + ^{S_1} \phi \\ & = \langle ..., \, C^{\star}, \, [C + S_1 \vdash \phi]^{S_1}, \, [C + S_1 \vdash \phi + \phi]^{S_1} \rangle \end{array}$

Reactions to assertions:

(21)  $S_1$ : [ACLP [[.] [CmP [[ $\vdash$ ] [TP I won the race]]]]] introduction of propositional

- S₂: (*Okay.*) +<sub>s</sub>, φ
- $S_2$ : Yes.  $+_{S_2}S_2 \vdash \varphi$
- S<sub>2</sub>: No. +<sub>S<sub>2</sub></sub> S<sub>2</sub>⊢¬φ



Figure 7: Assertion of  $\phi$ , followed by conventional implicature  $\phi$ 

discourse referent  $\phi$ , cf. Krifka 2013 acknowledgement of  $\phi$ assert  $\phi$ assert negation of  $\phi$ , requires retraction



Figure 8: Acknowledgement (okay), Confirmation (yes) and Contradiction (no) of an assertion

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# Interlude: Other Speech Act Types

Speech acts have effects on the world, modeled by proposition that describes it.

Veritatives: Public expression of guaranteeing truth; assertions, representatives

- S adds public commitment to truth of proposition: +<sup>s</sup> S⊢φ, 'S vouches for φ'
- The proposition φ itself is added by conversational implicature

Mutatives: Public expression of change in the world (cf. Barker 2012 on imperatives)

- Directives, commissives; definitions; declarations; magic spells; German inflectives
- S restricts the future histories to those in which φ is/becomes true, e.g. S<sub>1</sub>, to S<sub>2</sub>: Get well! – S<sub>1</sub> restricts histories to those in which S<sub>2</sub> gets well.
- Prohibitives as denegations of mutatives, e.g. Don't move! exludes those histories
- Disjunctions as speech act disjunction,
   e.g. Eat an apple or eat a pear union of histories in which A eats apple, A eats pear,
   Get out or I call the police union of histories in which A gets out, S calls the police
- In directives, commissives, hortatives: such histories changes result in obligations, perhaps as an indirect speech act, e.g. for directives: +<sup>s</sup> A !– φ
- May also count as expressions of wishes (indirect speech act)

Exhibitives: Public display of an attitude or preference: Exclamatives, Optatives (?)

- S adds a display of an attitude to an entity, a proposition etc. CS: +<sup>S</sup> S :- φ
- ◆ S, to A: How beautiful this picture is! +<sup>S</sup> S :- 'This picture is beautiful'

# **4** Questions

## 4.1 Questions as meta speech acts

Questions as Common Ground Management:

- They determine how the common around should develop
- Preferred development: Addressee answers the question
- (22) $C^* + S_1$  to  $S_2$ : Did I win the race?  $= [\{\sqrt{C}\} \cup C + S_2 \vdash \phi \cup C + S_2 \vdash \neg \phi]^{S_1}$

Possible reactions to polar question:

- (23) a. (22) +  $S_2$ : Yes. = (22) +  $S_2 \vdash \Phi$ 
  - b. (22) + S<sub>2</sub>: No. = (22) +  $S_2 = \nabla \phi$
- $(24)(22) + S_2 \Re + S_2 S_2$ : I don't know. =  $\langle \dots, C^*, [\{\sqrt{C}\} \cup C + S_2 \vdash \phi \cup C \cup S_2 \vdash \neg \phi]_{S_1}, C^{S_2}, [C + S_2 \vdash (\neg S_2 \text{ knows whether } \phi']^{S_2} \rangle$



Figure 11: Answers yes and no to bipolar question

SI: (C +S.+0 +S2H7Ka

Figure 10: Rejection of bipolar question

## 4.2 Monopolar questions

- Polar question as illustrated so far: Offer two assertions, of φ and ¬φ  $\Rightarrow$  **bipolar** question
- The framework also allows for questions that offer just one assertion, of φ ⇒ monopolar questions

Candidates for monopolar questions:

- (25) a. Declarative questions: I won the race?
  - b. Questions with negated propositions: Did I not win the race?
  - c. Option for regular questions: Did I win the race? (Different from: Did I win the race, or not?)
- (26)  $C^* + S_1$ , to  $S_2$ : I won the race?  $= [\{\sqrt{C}\} \cup C + S_2 \vdash \phi]^{S_1}$

Notice that response yes is straightforward, whereas no requires prior rejection

- Natural way of expressing question bias
- This option is not available for theories for which questions always denote a non-singleton set of propositions, or a disjunction, as in Inquisitive Semantics (Roelofson & Farkas 2015).



Figure 12: Monopolar (biased) question



Figure 9: Bipolar question



#### 4.3 Derivation of monopolar questions

 $\begin{array}{ll} \mbox{Monopolar questions:} \\ \mbox{ActP head ? creates a meta speech act (requests to commit to proposition).} \\ (27) & \ensuremath{\left[ [ A_{ct^o} ? Did \ensuremath{\right]} \ensuremath{\left[ [ C_{m^o} \vdash t_{did} \ensuremath{\right]} \ensuremath{\right]} \ensuremath{\left[ T_{p} I \ensuremath{\left[ t_{did} \ensuremath{win the race} \ensuremath{\right]} \ensuremath{\right]} \ensuremath{\right]} \ensuremath{\right]} \ensuremath{\right]} \ensuremath{\right]} \\ & = & \ensuremath{\left[ [ A_{ct^o} ? \ensuremath{D} \ensuremath{a} \ensure$ 

$$\begin{split} & [[A_{ct^{\circ}}?]]^{S_1S_2} \\ &= \lambda R \lambda C^*[\{\sqrt{C}\} \cup C + R(\mathbf{S_2})]^{S_1} \\ &= \lambda C^*[\{\sqrt{C}\} \cup C + S_2 \vdash S_1 \text{ won the race}']^{S_1} \end{split}$$

proposition head of CmP, same as assertion head of ActP, applies CmP to **addressee** monopolar guestion

Questions: Derivation of monopolar questions

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#### 4.4 Commitment Phrases in Conjunct/Disjunct systems (egophoricity)

Example: Kathmandu Newari (Hargreaves 2005; cf. Wechsler 2015).

(28)	Assertions			Questions			
	a. <i>jī:</i> 1.SG.ERG 'I drank a	<i>a:pwa</i> much lot.'	<i>twan−ā.</i> drink-PST. <mark>CJ</mark>	d.	. <i>jī:</i> '1.SG.ERG 'Did I drink	<i>a:pwa</i> <sup>much</sup> a lot?'	<i>twan−<b>a-l</b>a.</i> drink-PST. <mark>DJ</mark> -Q
	b. <i>chā</i> 2. SG.ERG 'You dran	<i>a:pwa</i> much k a loť	<i>twan−<b>a</b>.</i> drink-PST. <mark>DJ</mark>	e.	. <i>chā</i> 2.SG.ERG 'Did you dr	<i>a:pwa</i> <sup>much</sup> ink a lo	<i>twan−<b>ā-l</b>a.</i> drink-PST. <mark>CJ</mark> -Q t?'
	C. <i>Wā:</i>	a:pwa tv	van- <b>a</b> .	f.	wā:	a:pwa	twan- <b>a-</b> la.
	3. SG.ERG 'he/she di	much rank a lo	drink-PST. <mark>DJ</mark> t'		'3. SG.ERG 'Did he/she	much e drink a	drink-PST. <mark>DJ</mark> -Q a lot?'
Prop	oosal: CJ pre	esuppos	es Committer = Su	bje	ect, DJ pres	uppose	es Committer ≠ Subject
(29)	[[ <mark>CJ</mark> ]] <sup>S1S2</sup> =	· λΡλxλS	5. <mark>S=x</mark> [S⊢P(x)]		$\llbracket \frac{DJ}{J} \rrbracket^{S_1,S_2} = J$	ΝΡλχλS	. <mark>S≠x</mark> [S⊢P(x)]
For	3 <sup>rd</sup> pers. sub	jects in o	commitment report	s;	embedded	asserti	ons (cf. Krifka 2014):

(30) Syām-ā a:pwa twan-ā hã. Syam-ERG much drink-PST.CJ EVD 'Syam said that he drank too much.' *Syām-ā a:pwa twan-a hã.* Syam-ERG much drink-PFV.**DJ** EVD 'It is said that Sam drank too much.'

Questions: Commitment Phrases in Conjunct/Disjunct systems (egophoricity)

#### 4.5 Disjunctive questions

(31) Did Ed meet Ánn, or did Ed meet Béth? raising accent (question)
Proposal: Polar question disjunction (cf. Uegaki 2014 for Japanese, similar basic idea)
(32) [[<sub>ActP</sub> [<sub>ActP</sub> Did Ed meet Ann] or [<sub>ActP</sub> Did Ed meet Beth]]]<sup>S<sub>1</sub>S<sub>2</sub></sup>

with  $\llbracket [A_{ctP} Did Ed meet Ann] \rrbracket^{S_1S_2} = \lambda C^* [\{\sqrt{C}\} \cup C + S_2 \vdash Ed met Ann']^{S_1}$ and  $\llbracket [A_{ctP} Did Ed meet Beth] \rrbracket^{S_1S_2} = \lambda C^* [\{\sqrt{C}\} \cup C + S_2 \vdash Ed met Beth']^{S_1}$ and  $\llbracket or \rrbracket^{S_1S_2} = \lambda A\lambda A'\lambda C^* [A(C) \cup A'(C)]^{S_1}$ , where A, A': variables over speech acts  $= \lambda C^* [[\{\sqrt{C}\} \cup C + \frac{S_2}{E} \vdash Ed met Ann'] \cup [\{\sqrt{C}\} \cup C + \frac{S_2}{E} \vdash Ed met Beth']]^{S_1}$  $= \lambda C^* [\{\sqrt{C}\} \cup C + \frac{S_2}{E} \vdash Ed met Ann' \cup C + \frac{S_2}{E} \vdash Ed met Beth']]^{S_1}$ 



Figure 13: Disjunctive question as disjunction of two monopolar questions

#### 4.6 Alternative (disjunctive) questions

Disjunctive questions come about as disjunctions of monopolar questions: recall that disjunctions are defined for meta speech acts.

(33) S<sub>1</sub> to S<sub>2</sub>: Did I win the race. or not? = [[<sub>ActP</sub> Did I win the race]]<sup>S<sub>1</sub>S<sub>2</sub></sup> V [[ActP did I not win the race]]<sup>S1S2</sup> =  $\lambda C^*[\{\sqrt{C}\} \cup C + S_2 \vdash S_1 \text{ won the race'}]$  $\cup$  [{ $\sqrt{C}$ }  $\cup$  C + S<sub>2</sub> $\vdash$ ¬'S<sub>1</sub> won the race']]<sup>S<sub>1</sub></sup>

Simple answer ves / no avoided. as there are two propositional discourse referents:

(34) 
$$[_{ActP} [_{ActP} ? Did [_{CmP} \vdash [_{IP} I win the race]]] or [_{ActP} ? did [_{CmP} \vdash [_{IP} I not win the race]]]]$$

Cf. disjunctive formation of bipolar questions in Mandarin:

(35) a. monopolar guestion: b. bipolar question: Nǐ chī píngauŏ ma? Nǐ chī bù chī pínaauŏ? vou eat apple QUEST you eat not eat apple 'Do you eat apples?', 'You eat apples?' 'Do you eat apples (or not)?'

Questions: Alternative (disjunctive) guestions

#### 4.7 Constituent Questions as disjunctive questions

(36) a. Which woman did Ed meet? (Ann. Beth. or Carla?) b. Did Ed meet Ann, or did Ed meet Beth, or did Ed meet Carla?

In English, wh-phrases in root questions are moved to SpecActP:

 $(37) \llbracket_{\text{ActP}} \llbracket_{\text{DP}} which woman]_{i} \llbracket_{\text{Act'}} \llbracket_{\text{Act'}} ?-did \rrbracket_{\text{CmP}} \llbracket_{\text{CmP}} \vdash_{\text{I}} \llbracket_{\text{DP}} Ed t_{did} meet \frac{t_{i}}{t_{i}} \rrbracket_{\text{S1S2}}$ 

=  $\llbracket [_{DP} which woman] \rrbracket^{S_1S_2} (\lambda x_i \llbracket [_{Act'} [_{Act''}?-did] [_{CmP} \llbracket [_{Cm'} \vdash ] ]_{TP} Ed t_{did} meet t_i]]] \rrbracket^{S_1S_2,t/x_i})$ 

with  $\lambda x_i \llbracket [Act' [Act' ?-did] [CmP [[Cm^o \vdash] ]TP Ed t_{did} meet t_i]]] \rrbracket^{S_1S_2,t/x_i}$ =  $\lambda x_i \lambda C^*[\{\sqrt{C}\} \cup C + S_2 \vdash Ed met x_i]^{S_1}$ 

and  $\llbracket [_{DP} which woman] \rrbracket^{S_1S_2} = \lambda R \ \lambda C^{\star} [\bigcup_{x \in [woman]} [R(x)(C)]^{S_1}$ 

=  $\lambda C^{*}[\{\sqrt{C}\} \cup \bigcup \{C + S_2 \vdash Ed met x_i \mid x_i \in woman\}]^{S_1}$ 



Figure 15: Constituent question Which woman did Ed meet? as disjunction of monopolar questions.

Figure 14: Disjunction of monopolar questions

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# 5 Focus in Answers and Questions

#### 5.1 Focus in Answers

(38) a. S<sub>1</sub>: Who met Ann? S<sub>2</sub>: [ED]<sub>F</sub> met Ann. b.  $S_1$ : Who did Ed meet? S<sub>2</sub>: Ed met [ANN]<sub>F</sub>

Focus in answer leads to a set of alternatives that matches the question (Rooth 1992): here: alternative assertions.

(39)  $\llbracket [ACTP Ed met [ANN]_F.] \rrbracket^{S_2S_1}$  (with alternatives Ann, Beth, Carla): meaning:  $\lambda C^*[C + S_2 \vdash Ed met Ann']^{S_1}$ alternatives: { $\lambda C^*[C + S_2 \vdash Ed met Ann']^{S_2}$ ,  $\lambda C^*[C + S_2 \vdash Ed met Beth']^{S_2}$  $\lambda C^*[C + S_2 \vdash Ed met Carla']^{S_2}$ 

Condition for Q/A focus congruence: Alternatives of Answer ⊆ Meaning of Question



Figure 16: (a) Meaning of question, (b) meaning of answer, (c) alternatives of answer

Focus in Answers and Questions: Focus in Answers

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## 5.2 Focus in questions

Here: Focus in monopolar questions; special markers e.g. Russian li

(40)  $S_1$ : Did Ed meet  $[ANN]_F$ ?  $S_2$ : Yes.

rising accent S<sub>2</sub>: #No. / No, he met [BETH]<sub>F</sub>.

Focus indicates alternative monopolar question:

(41) [[ActP Did Ed meet [ÁNN]<sub>F</sub>?]]<sup>S1S2</sup> (with alternatives Ann, Beth, Carla)

 $\lambda C^* [\{\sqrt{C}\} \cup C + S_2 \vdash Ed met Ann']^{S_1}$ meaning: alternatives: {  $\lambda C^*[\{\sqrt{C}\} \cup C + S_2 \vdash Ed met Ann']^{S_1}$ ,  $\lambda C^*[\{\sqrt{C}\} \cup C + S_2 \vdash Ed met Beth']^{S_1}$ ,  $\lambda C^*[C^*, [{\sqrt{C}} \cup C + S_2 \vdash Ed met Carla']^{S_1}$ 

The union of the guestion alternatives form the background, which is accommodated; in case question is answered negatively, this background question remains.



Figure 17: (a) Background, (b) question, (c) rejection, (d) assertion of negated proposition, (e) assertion of other proposition

# **6** Questions with Polarity Phrases

# 6.1 Polarity Phrase

(42) A: *I* don't believe that you won the race. B: *I* DID win the race. (Verum focus) Proposed syntactic structure, with Polarity Phrase PolP (43) [ $_{PolP} I$  [ $_{Pol^{P}}$  pol - did] [ $_{IP} t_{i} t_{did}$  win the race]]]] Semantic contribution of pol: (44) a. Meaning:  $\lambda p[p]$  (identity function) Redundant, hence always with alternative: b. Alternatives: { $\lambda p[p], \lambda p[\neg p]$ } (45)  $[[_{Pol^{P}} []_{Pol^{P}} pol - did] [_{IP} I t_{did}$  win the race]]]] $^{S_{1}S_{2}} = [[_{Pol^{P}} pol]]^{S_{1}S_{2}} ([[_{IP} I t_{did} win the race]]]^{S_{1}S_{2}})$ Meaning: 'S<sub>1</sub> won the race' Alternatives: {'S<sub>1</sub> won the race', ¬'S<sub>1</sub> won the race'} Q/A congruence to bipolar question: (46) S<sub>2</sub>: Did you win the race, or not? S<sub>1</sub>: I DID win the race.

Questions with Polarity Phrases: Polarity Phrase



(b) Q/A congruence: Alternatives of answer fit question

(c)

Answer



C

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# 6.2 Bipolar interpretations of yes/no questions

We have analyzed simple yes/no questions as **monopolar**, but they arguably also have a **bipolar** reading, e.g. when auxiliary is accented:

(47) S1: DID I win the race?

We assume: Alternatives of the polarity phrase project to ActP; raising accent on did

 $\begin{array}{l} (48) \ \mathbb{I}_{[\mathsf{ActP}}\left[[\mathsf{ActP} : \mathsf{C}\mathsf{PDID}\right] \ \mathbb{C}_{\mathsf{DPP}}\left[[\mathsf{C}\mathsf{m}^\circ \vdash t_{did}\right] \ \mathbb{P}_{\mathsf{O}\mathsf{P}} \text{ pol-} t_{did}\right] \ [I \ t_{did} \ win \ the \ race]]]]]]] \mathbb{J}^{S_1S_2} \\ \text{Meaning: } \lambda \mathbb{C}^*[\{\sqrt{\mathsf{C}}\} \cup \mathsf{C} + S_2 \vdash \mathsf{'I} \ \text{won the } race']^{S_1} \\ \text{Alternatives: } \{ \lambda \mathbb{C}^*[\{\sqrt{\mathsf{C}}\} \cup \mathsf{C} + S_2 \vdash \mathsf{'I} \ \text{won the } race']^{S_1}, \\ \lambda \mathbb{C}^*[\{\sqrt{\mathsf{C}}\} \cup \mathsf{C} + S_2 \vdash \neg^\mathsf{'I} \ \text{won the } race']^{S_1} \} \end{array}$ 

- (49) S<sub>2</sub>: Yes, you did.  $\lambda C^*[C + S_2 \vdash S_1 \text{ won the race'}]^{S_2}$
- (50) S<sub>2</sub>: *No, you didn't.*  $\lambda C^*[C + S_2 \vdash \neg S_1 \text{ won the race'}]^{S_2}$ Requires prior retraction, then assertion of the only alternative left.

Question is not quite symmetric, but signals interest in positive and negative answer.



# **7 Negated Questions**

# 7.1 Monopolar question with propositional negation

Negation part of the proposition, modifier or per NegP:

(51)  $\llbracket [ActP[[Act^{\circ} ? Did]] [CmP[[Cm^{\circ} \vdash t_{did}]] [TP/NegP I [T/Neg] not [TP t/ t_{did} win the race]]]] \rrbracket^{S_1S_2}$ 

=  $\lambda C^{*}[\{\sqrt{C}\} \cup C + S_2 \vdash \neg S_1 \text{ won the race'}]^{S_1}$ 

Notice:

- This is different from non-negated monopolar question, bias towards negative answer
- In standard accounts (Hamblin, Groenendijk & Stokhof, Roelofsen) non-negated and negated yes/no questions have the same meaning: {p, ¬p} = {¬p, ¬p}



Figure 20: Monopolar (biased) question with propositional negation

 Interpretation of responses yes / no is not straightforward, as two propositional discourse referents, φ and ¬φ, are introduced (cf. Krifka 2013, Meijer e.a. 2015).

Negated Questions: Monopolar question with propositional negation

## 7.2 Monopolar question with high negation

High negation is interpreted at the level of the commitment phrase,

(52) [[<sub>ActP</sub>[[<sub>Act<sup>o</sup></sub> ? *Did*] [<sub>CmP/NegP</sub>[<sub>Cm'/Neg'</sub> *n't* [<sub>CmP</sub> [[<sub>Cm<sup>o</sup></sub>⊢] [<sub>TP</sub> *I* t<sub>did</sub> win the race]]]]]]]<sup>S<sub>1</sub>S<sub>2</sub></sup>

 $= [[Act^{\circ}?]]^{S_1S_2}([not]]^{S_1S_2}([+]^{S_1S_2}([[+]^{S_1S_2}([[T_{P} I did win the race]]^{S_1S_2})))$ 

 $= \lambda C^* [\{ \sqrt{C} \} \cup C + \neg S_2 \vdash \phi]^{S_1}$ 

- With this move, S<sub>1</sub> asks S<sub>2</sub> to express non-commitment towards the proposition φ.
- Notice that adding ¬S<sub>2</sub>⊢φ to the CSp precludes commitment to φ, i.e., S<sub>2</sub>⊢φ, but is compatible with commitment to ¬φ, i.e., S<sub>2</sub>⊢¬φ.
- Hence, ¬S₂⊢φ is weaker than S₂⊢¬φ, i.e. S₁ imposes fewer restrictions on S₂, explains politeness effect.

Reactions to high negation questions:



Figure 21: High negation question

- The TP introduces a discourse referent φ, can be picked up by no, asserts ¬φ.
- The answer yes requires a rejection of the last move in.
- The reaction *I* don't know does not require a rejection, as it is compatible with S<sub>2</sub> being not committed to φ.

#### 7.3 More on high negation questions

The pragmatics of high negation

- Notice: Speaker S<sub>1</sub> has epistemic tendency for φ, but this is not the preferred move: If S<sub>2</sub> asserts φ, S<sub>2</sub> first has to reject + ¬ S<sub>2</sub> ⊢ φ
- S<sub>1</sub> actually makes it more difficult for S<sub>2</sub> to assert φ
- Strategy: Attempt to exclude options

Pragmatic strategies can run counter official semantic strategies:

- ♦ Negative polarity items in questions: S<sub>1</sub>, to S<sub>2</sub>: Did you ever lift a finger to help me?
- S<sub>1</sub> makes it as easy as possible for S<sub>2</sub> to give a positive answer, under the assumption that this will not be possible (Krifka 1995).
- This amounts to a negative assertion: You never lifted a finger to help me.

Alternative account of Romero & Han 2004:

- High negation question asks that one of  $\{sure(\phi), \neg sure(\phi)\}$  should be accepted,
- but notice that answer *no* means  $\neg \phi$ , not  $\neg$  sure( $\phi$ )

Negated Questions: More on high negation questions

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#### 7.4 Questions of bias

A variety of expressing yes/no questions:

$\begin{array}{l} (53) \text{ a. } \{ \sqrt{C} \} \cup C + [S_2 \vdash \phi]^{S_1} \\ \{ \sqrt{C} \} \cup C + [S_2 \vdash \neg \phi]^{S_1} \end{array}$	monopolar question monopolar question, negated proposition
$b. \left\{ \sqrt{C} \right\} \cup C + S_2 \vdash \phi \cup C + \left[ S_2 \vdash \neg \phi \right]^{S_1}$	bipolar question
c. $\{\sqrt{C}\} \cup C + [\neg S_2 \vdash \phi]^{S_1}$	high negation question
${√C} ∪ C + [¬S2⊢¬φ]S1$	high negation question, negated proposition

Discussion of biases: Büring & Gunlogson 2000, Sudo 2013, Gärtner & Gyuris 2016 Sudo discusses two different kinds of bias:

- Evidential bias
- Epistemic bias

Evidential bias:

- (54) [S<sub>2</sub> enters the windowless computer room, raincoat dripping.]
  - a. Is it raining?
  - b.# Is it not raining?
  - c. # Is it sunny?
  - d.# Is it raining, or not?
  - e.# Isn't it raining?
  - f. #IS it raining?

(55) a. Asking the monopolar question  $S_2 \vdash \phi$ , if  $\phi$  is likely,

results in a smooth conversation (simple affirmation).

- b. Asking the monopolar question  $S_2 \vdash \neg \phi$  would result in a likely rejection, which should be avoided in smooth communication.
- c. Would also result in a likely rejection, as sunny  $\rightarrow \neg$  raining
- d. Bipolar questions suggest that  $\varphi$  and  $\neg \varphi$  are equally likely, if  $\varphi$  is more likely, (a) is to be preferred.
- e. Checking whether  $S_2$  would refrain from asserting  $\phi$  is a rather complex move, appropriate only if  $\phi$  is controversial.
- f. Also a bipolar question, focus on auxiliary indicates alternatives  $\lambda p[p]$ ,  $\lambda p[\neg p]$

Negated Questions: Questions of bias

Epistemic bias:

(56) S<sub>2</sub>: You must be starving. You want something to eat?

- S<sub>1</sub>: Yeah. I remember this place from my last visit.
  - a. Isn't there a vegetarian restaurant around here? b. (#) Is there a vegetarian restaurant around here?

Explanation of preference of high negation question (a):

- S₁ checks whether S₂ refrains from committing to the proposition φ, that is, whether S₂ is willing to add ¬S₂⊢φ to the common ground.
- Rationale: S<sub>1</sub> has an epistemic tendency favoring φ and is interested whether the strength of this belief can be increased; S<sub>1</sub> considers S<sub>2</sub> as a possible independent source.
- But S₁ does not want to impose the epistemic tendency for φ on S₂ by making asserting ¬φ an easy option, as with the biased question based on S₂⊢φ (b).
- (a) does not force S₂ to commit to φ or ¬φ directly, but rather officially invites S₂ to refrain from a commitment for φ. Explains politeness of high negation questions.
- (a) makes it easier to answer negatively, by S<sub>2</sub>⊢¬φ; strategy of S<sub>1</sub>: maximize the chances for S<sub>2</sub> to actually commit to ¬φ. If S<sub>2</sub> against these odds commits to φ, then S<sub>1</sub> can assume that this commitment was not obtained by force.

# 8 Question tags

Matching and reverse guestion tags (Cattell 1973):

- (57) You are tired, are vou?
- (58) a. I have won the race, haven't I? b. I haven't won the race, have I?

### 8.1 Matching guestion tags

Speech act conjunction of an assertion and a question

(59) I have won the race, have I?

 $C +_{S_1} \llbracket \llbracket_{\mathsf{ActP}} \llbracket \ . \ ] \llbracket_{\mathsf{CmP}} \llbracket \vdash \rrbracket \llbracket_{\mathsf{TP}} I \text{ have won the race} \rrbracket \rrbracket \rrbracket^{S_1 S_2} \&$  $[[ActP] ?] [CmP[H] [TP | have won the race]]] <math>\mathbb{I}^{S_1S_2}$ 

 $= [[C + S_1 \vdash \phi] \cap [\{\sqrt{C}\} \cup C + S_2 \vdash \phi]]^{S_1}$ 

- The overall effect is that S₁ proposes to S₂ that both  $S_1$  and  $S_2$  are committed to the proposition  $\varphi$ .
- That is. S<sub>1</sub> proposes dark central area as new commitment space.
- S₁ can propose S₂⊢φ because φ is understood as a commitment that S₂ has already anyway Cattell: "Voicing a likely opinion by the addressee".
- Hence: Evidential bias towards φ

Question tags: Matching guestion tags

## 8.2 Reverse question tags

Speech act **disjunction** of an assertion and a question (with propositional negation)

(60) I have won the race, haven't I?

- C +<sub>S1</sub> [[[ActP [ . ] [CmP [H] [TP I have won the race]]]]  $\mathbb{I}^{S_1S_2}$  V
  - $\llbracket [ActP [? have'nt] [CmP [] | ] [TP [[t_n]] [TP I t_{have} won the race]]]] \rrbracket^{S_1 S_2}$

 $= |[C + S_1 \vdash \phi] \cup [\{\sqrt{C}\} \cup C + S_2 \vdash \neg \phi]|^{S_1}$ 

- The resulting commitment space is the total hatched area.
- This excludes that S<sub>2</sub> is committed to φ but  $S_1$  is committed to  $\neg \varphi$ .
- This means that if S<sub>2</sub> commits to φ. then  $S_1$  is committed to  $\varphi$  as well.
- That is, S<sub>1</sub> puts forward a commitment to φ, asking S<sub>2</sub> for support.
- If S<sub>2</sub> does not provide this support by committing to ¬φ.  $S_1$  is free to either stick with the commitment to  $\varphi$ . or to retract it and even assert  $\neg \phi$ , without contradicting an earlier commitment.
- Epistemic bias towards φ, seeking confirmation



Figure 22: Matching question tag

Figure 23: Reverse question tag

# 9 Embedded Questions

#### 9.1 Nature and kind of embedded questions

Questions also occur as embedded syntactic objects:

- (61) a. Who won the race?
  - b. Bill knows who won the race.

But there are important differences between root and embedded questions:

(62) a. Who did Ed meet?	*Who Ed met?
b. Bill knows who Ed met.	*Bill knows who did Ed meet.
(63) a. Did Ed meet Beth? b. Bill knows whether / if Ed met Beth.	*Whether / if Ed met Beth? *Bill knows did Ed meet Beth?
(64) a. Did Ed meet Ann or Beth? b. Bill knows whether Ed met Ann or Beth.	*Whether Ed met Ann or Beth? *Bill knows did Ed meet Ann or Beth?
Discourse particles in German:	

(65) a. Wen hat Ed denn getroffen? b. Bill weiß. wen Ed \*denn getroffen hat.

This is evidence that embedded questions do not involve ActP and CmP, but they involve structure beyond a TP.

Embedded Questions: Nature and kind of embedded guestions

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#### 9.2 Whether

Embedded guestions and declaratives form a CP, not a CmP or ActP:

(66) a. [CP [[C whether] [TP Ed met Ann]]]

b. [CP [[Co that] [TP Ed met Ann]]]

Whether / Q turns TP proposition into a set of propositions, with two options:

- Bipolar: λp {p, ¬p} (cf. etymology: wh + either)
- Monopolar: λp [p]

Evidence for monopolar operator:

(67) I doubt whether the Benefits of opposition to the Constitution... (G. Washington)

- (68) a.  $[_{CP} [_{CP} [_{C^{\circ}} whether] ]_{TP} Ed met Ann]]] or <math>[_{CP} [_{C^{\circ}} whether] [_{TP} he met Beth]]]]$ 
  - b. [CP [[C whether or not] [TP Ed met Ann]]]
  - c. [CP [[C whether] [TP Ed met ANN, BETH or CARIa]]]
- (69)  $\llbracket [[_{CP} [[_{CP} whether]]]_{TP} Ed met Ann]] or [_{CP} [[_{CP} whether]]_{TP} he met Beth]]] <math>\llbracket^{S_1 S_2}$ =  $\lambda p[p]$ ['Ed met Ann']  $\vee \lambda p[p]$ ['Ed met Beth'] = {'Ed met Ann'}  $\cup$  {'Ed met Beth'] = {'Ed met Ann'}  $\cup$  {'Ed met Beth'}, = {'Ed met Ann', 'Ed met Beth'}

Bipolar operator:

(70)  $\llbracket [CP [[Co whether]] TP Ed met Ann]] \rrbracket^{S_1 S_2}$ 

<sup>=</sup>  $\lambda p\{p, \neg p\}$  ('Ed met Ann'), = {'Ed met Ann', ¬'Ed met Ann'}

#### 9.3 Embedded Constituent Questions

Assumption for syntactic structure: Qu head

(71) a. [CP whoi [[C° Qu ] [TP Ed met ti]]]

b. [\_CP wen [[\_C° (<u>dass</u>)] [\_TP Ed t<sub>wen</sub> getroffen hat]]] (Southern German) Qu is interpreted like whether, i.e. introduces singleton sets.

 $(72) \llbracket [c_{\mathsf{P}} [which woman]_{i} [[c^{\circ} Qu ] [_{\mathsf{TP}} Ed met t_{i}]]] \rrbracket^{S_{1}S_{2}} \\ = \llbracket which woman \rrbracket^{S_{1}S_{2}}(\lambda_{x_{i}} [\llbracket Qu \rrbracket^{S_{1}S_{2}}(\llbracket [_{\mathsf{TP}} Ed met t_{i}]]\rrbracket^{S_{1}S_{2},t/x_{i}})]) \\ \text{with } \llbracket [_{\mathsf{TP}} Ed met t_{i}]\rrbracket^{S_{1}S_{2},t/x_{i}} = `Ed met x_{i}' \\ \text{and } \llbracket Qu \rrbracket^{S_{1}S_{2}} = \lambda p\{p\} \\ \text{and } \llbracket which woman \rrbracket^{S_{1}S_{2}} = \lambda \mathbb{R} \bigcup_{x \in [woman]S_{1}S_{2}} \mathbb{R}(x) \\ \text{we have: } \bigcup_{x \in [woman]S_{1}S_{2}} \{ `Ed met x' \}, = \{`Ed met x' \mid x \in \llbracket woman \rrbracket^{S_{1}S_{2}} \}$ 

Question-embedding know reduces to proposition-embedding know:

(73)  $\llbracket know \rrbracket(Q)(\llbracket Ed \rrbracket) \Leftrightarrow \forall p \in Q[p \text{ is true} \rightarrow \llbracket know \rrbracket(p)(\llbracket Ed \rrbracket)]$ 

'for every true proposition in the set of propositions, Ed knows that it is true.' Notice: strong exhaustive interpretation when Qu is interpreted as  $\lambda p\{p, \neg p\}$ 

Embedded Questions: Embedded Constituent Questions

9.4 Comparison: Wh in Root vs. embedded questions

Wh in embedded questions: Disjunctions of sets of propositions.

Wh in root questions Disjunctions of functions from CSp to CSp

 $\begin{array}{ll} (75) \text{ a. } \lambda C[\mathfrak{A}(C)] \vee \lambda C[\mathfrak{B}(C)] & = \lambda C[\mathfrak{A}(C) \cup \mathfrak{B}(C)] \\ \text{ b. } \lambda R \left[ \bigcup_{x \in WH} R(x) \right] (\lambda y \lambda C[\mathfrak{A}(y)(C)]) & = \lambda C \left[ \bigcup_{x \in WH} \mathfrak{A}(x) \right] \end{array}$ 

Basic meaning in either case: set union (corresponding to disjunction); difference just a matter of type (where e: entities, st: propositions)

Root questions: who is of type [[e → {st}] → {st}]

• Embedded questions: who is of type  $[[e \rightarrow [CSp \rightarrow CSp]] \rightarrow [CSp \rightarrow CSp]]$ Cf. also: Wh with indefinite interpretation, as in German, or engl. somewhere (76) Ed hat wen getroffen. 'Ed met someone'

(77) a. p 
$$\vee$$
 q b.  $\lambda P \bigcup_{x \in WH} P(x) (\lambda y[p(y)])$  who is of type [[e  $\rightarrow$  st]  $\rightarrow$  st]

#### 9.5 Embedded root questions

Predicates like wonder, ask, be interested in are different:

- Root syntax possible:
- (78) a. Ed wondered who he met.
  - b. % Ed wondered who did he meet. (Irish English, cf. McCloskey 2005)
- Discourse particles that occur in root questions:
- (79) a. Wen hat Ed denn getroffen?
  - b. Ed weiß, wen er \*denn getroffen hat.
  - c. Ed fragte sich, wen er <u>denn</u> getroffen hat / habe.

Krifka (2014) argues that such questions are different:

- They may denote illocutionary acts
- This is possible, as ActPs are semantic objects, with a proper semantic type (CSD → CSD)
- (80) Ed [wondered [ActP who did he meet]]
- (81) x wonders Q, where Q: a question speech act 'in the situation s referred to.

x is interested in the answer to the speech act Q performed in that situation'

Embedded Questions: Embedded root questions

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## **10** Conclusion

Goals of the talk:

- Argue for dynamic semantics for speech acts (cf. Szabolcsi)
- Introduce a framework of conversation as development of common ground (cf. Stalnaker, Lewis, ...)
- Common grounds contain the commitments of interlocutors (Commitment States)
- New: Common grounds have a projective component (Commitment Spaces) that models common ground management
- Questions have an effect on the projective component: they restrict the legal development of the common ground.
- There are "monopolar" questions that project just one legal development; this can be used to model biased questions
- Proposals for focus in answers to questions and focus in questions, in particular, focus in polarity questions
- Proposals for polarity (yes/no) questions, alternative questions, constituent (wh-) questions, question tags.
- Explanation of biases of such questions
- Relation between root and embedded questions

This talk is partly based on Krifka 2015.

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