Constituent, alternative, and yes/no questions as multipolar, bipolar, and monopolar requests for assertions

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1 Introduction

Goals of the talk

- Introduce a framework of conversation as development of common ground (cf. Stalnaker, Lewis, ...)
- Common grounds contain the commitments of interlocutors (Commitment States) (cf. Brandom 1983, Farkas & Bruce 2009)
- New: Common grounds have a **projective** component (Commitment Spaces) that models common ground management (cf. Cohen & Krifka 2014)
- Questions have an effect on the projective component: they restrict the legal development of the common ground (Krifka 2015)
- There are **monopolar** questions that project just one legal development; this can be used to model biased questions
- Proposals for polarity (yes/no) questions, alternative questions, constituent (wh-) questions, question tags.
- Explanation of **biases** of such questions

The talk is largely based on:

- Krifka, Manfred. 2015. Bias in Commitment Space Semantics: Declarative questions, negated questions, and question tags. *Semantics and Linguistic Theory* (*SALT*) 25, 328-345. Washington, D.C.: LSA Open Journal Systems.

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,
  modeled as sets of commitments

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

(1) $c + \mathfrak{A}_\varphi = c \cup \{\varphi\}$,
where φ: the commitment introduced
by speech act $\mathfrak{A}_\varphi$.

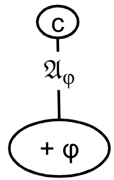


Figure 1: Update of commitment state

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)

2.2 Commitment Spaces (CSp)

Commitment state: common ground content.

Common ground management:
Possible continuations of commitment state,
Commitment Spaces.

(2) C is a commitment space
if C is a set of commitment states,
with $\cap C \neq \varnothing$ and $\cap C \in C$

- We call $\cap C$ the root of C, and write $\sqrt{C}$.
- $\sqrt{C}$ is the set of propositions that participants have positively committed to.

Update of C with speech act $\mathfrak{A}_\varphi$:

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

Modeling of **denegation** (Cohen & Krifka 2014):

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

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

(5) $C + {\sim}\mathfrak{A} = C — [C + \mathfrak{A}]$

Notice: The root does not change (**meta speech act**).

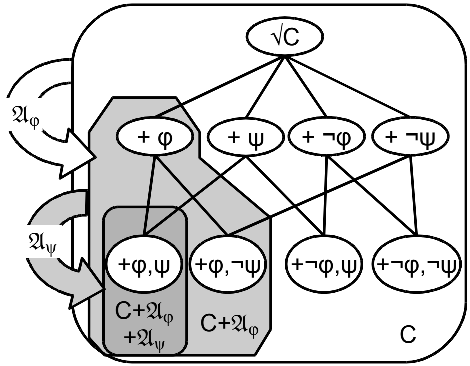


Figure 2: Updates of commitment space

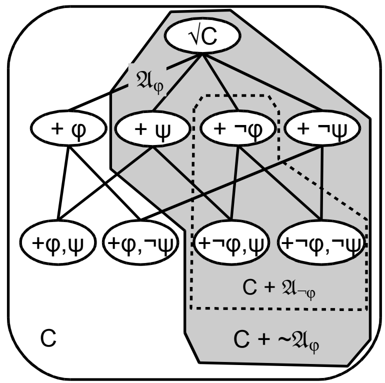


Figure 3:
Update with denegation of φ vs. ¬φ

Further operations on Common Grounds:

Speech act conjunction:

(6) $C + [\mathfrak{A} \,\&\, \mathfrak{B}]$
$= [C + \mathfrak{A}] \cap [C + \mathfrak{B}]$
$\approx C + \mathfrak{A} + \mathfrak{B}$ (except for
$\approx C + \mathfrak{B} + \mathfrak{A}$ anaphoric bindings)

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

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

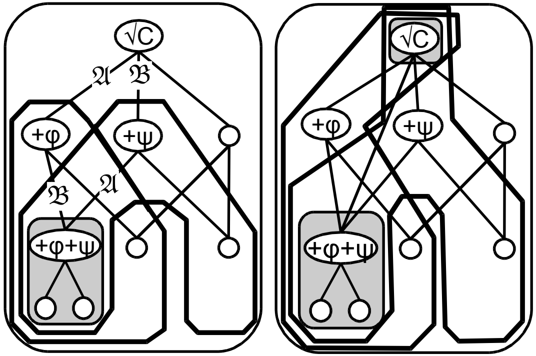


Figure 4:
Conjunction of regular and meta speech acts

Speech act disjunction:

(7) $C + [\mathfrak{A} \vee \mathfrak{B}]$
$= [C + \mathfrak{A}] \cup [C + \mathfrak{B}]$

Results in a rooted set for meta speech acts.

Speech acts cannot in general be disjoined,
unclear which of the disjuncts is in the root.

Possible resolution: Assume $+[\varphi \vee \psi]$,
propositional disjunction.

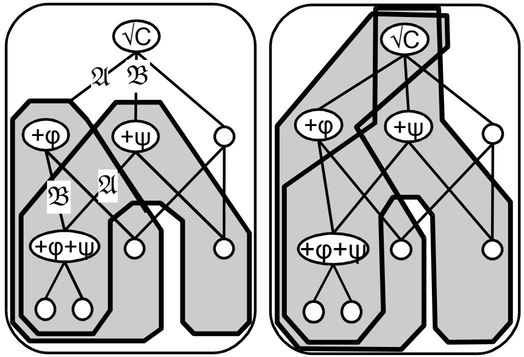


Figure 5:
Disjunction of regular and meta speech acts

2.3 Commitment Space Developments (CSD)

Record of the history of the update by a sequence:

(8) $\langle C_0, C_1, \ldots C_n \rangle$,
C_n: the current CSp

Update of a commitment space development:

(9) $\langle ..., C\rangle + \mathfrak{A} = \langle ..., C, C+\mathfrak{A}\rangle$

Update of a CSD
with speech act $\mathfrak{A}$ by actor S:

(10) $\langle ..., C^{S'}\rangle +^{S} \mathfrak{A} = \langle ..., C^{S'}, [C + \mathfrak{A}]^{S}\rangle$

Rejection of last update by rejection operato $\mathfrak{R}$
(cf. “table” in Farkas & Bruce 2010):

(11) $\langle ..., C^{*}, C'^{*}\rangle +^{S} \mathfrak{R} = \langle ..., C^{*}, C'^{*}, C^{S}\rangle$

Updates as functional applications:

(12) a. $c + \mathfrak{A}_{\varphi} = \mathfrak{A}_{\varphi}(c)$, where $\mathfrak{A}_{\varphi} = \lambda c[c \cup \varphi]$
b. $C + \mathfrak{A} = \mathfrak{A}(C)$, where $\mathfrak{A} = \lambda C\{c \in C \mid \sqrt{C} + \mathfrak{A} \subseteq c\}$
c. $\langle ..., C^{*}\rangle +^{S} \mathfrak{A} = \mathfrak{A}^{S}(\langle ..., C^{*}\rangle)$, where $\mathfrak{A}^{S} = \lambda\langle ..., C^{*}\rangle \langle ..., C, [\mathfrak{A}(C)]^{S}\rangle$
d. $\langle ..., C\rangle +^{S} \mathfrak{R} = \mathfrak{R}^{S}(\langle ..., [C]_{...}\rangle)$, where $\mathfrak{R}^{S} = \lambda\langle ..., C^{*}, C'^{*}\rangle, \langle ..., C^{*}, C'^{*}, C^{S}\rangle$

3 Assertions

3.1 Assertions as commitments

Proposal: By asserting a proposition,
speaker makes a public commitment for the truth of that proposition
(cf. e.g. Brandom 1983).

(13) $S \vdash \varphi$
'S is publicly committed to the truth of φ'

Alternative proposal: S wants that addressee believes φ (Bach & Harnish 1979).
Problem:

(14) *Believe it or not, I won the race*.

But: By committing to a proposition φ, S gives addressee a reason to believe φ.

Reason: Committing to false propositions leads to social sanctions,
which S tries to avoid.

As the intention that addressee believes the proposition is cancellable, (cf. (14)
this is a **conversational implicature**.

General effect of assertion:

(15) $\langle ..., C^{*}\rangle +^{S_1} S_1 \vdash \varphi = \langle ..., C^{*}, [C + S_1 \vdash \varphi]^{S_1}\rangle$
$= \langle ..., C^{*}, \{c \subseteq C \mid \surd C + S_1 \vdash \varphi \subseteq c\}^{S_1}\rangle$

3.2 Syntactic structure of assertion

Assertions involve the following projections:

- Asserted proposition: TP
- Proposition expressing commitment: CmP
- Application to CSD (speech act): ActP

Following principles of X-bar-syntax; head raising of finite verb to Cm° or even Act°:

(16) a. $[_{\text{ActP}}\ [[_{\text{Act}^\circ}\ .\ ]\ [_{\text{CmP}}\ [[_{\text{Cm}^\circ} \vdash\ ]\ [_{\text{TP}}\ \textit{I won the race}]]]]]$
b. $[_{\text{ActP}}\ [[_{\text{Act}^\circ}\ .\ ]\ [_{\text{CmP}}\ \textit{I}\ [[_{\text{Cm}^\circ} \vdash \textit{won}\ ]\ [_{\text{TP}}\ t_{I}\ t_{won}\ \textit{the race}]]]]]$
c. $[_{\text{ActP}}\ \textit{I}\ [[_{\text{Act}^\circ}\ .\ \textit{won}]\ [_{\text{CmP}}\ [t_{I}\ [_{\text{Cm}^\circ} \vdash t_{won}]\ [_{\text{TP}}\ t_{I}\ t_{won}\ \textit{the race}]]]]]$

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

(17) $[\![[_{\text{ActP}}\ [[_{\text{Act}^\circ}\ .\ ]\ [_{\text{CmP}}\ [[_{\text{Cm}^\circ} \vdash\ ]\ [_{\text{TP}}\ \textit{I won the race}]]]]]]\!]^{S_1S_2}$
$= [\![[_{\text{Act}^\circ}\ .\ ]]\!]^{S_1S_2}([\![[[_{\text{Cm}^\circ} \vdash]\ [_{\text{TP}}\ \textit{I won the race}]]]\!]^{S_1S_2})$
$= [\![[_{\text{Act}^\circ}\ .\ ]]\!]^{S_1S_2}([\![[_{\text{Cm}^\circ} \vdash]]\!]^{S_1S_2}([\![[_{\text{TP}}\ \textit{I won the race}]]\!]^{S_1S_2}))$

with	$[\![[_{\text{TP}}\ \textit{I won the race}]]\!]^{S_1S_2}$ = ‘S_1 won the race’	proposition, TP
	$[\![[_{\text{Cm}^\circ} \vdash]]\!]^{S_1S_2} = \lambda p \lambda S[S \vdash p]$	head of CmP
	$[\![[_{\text{Act}^\circ}\ .\ ]]\!]^{S_1S_2} = \lambda R \lambda\langle ..., C^* \rangle[\langle ..., C^*, [C + R(S_1)]^{S_1} \rangle]$	head of ActP

$= \lambda\langle ..., C^* \rangle\ [\langle ..., C^*, [C + S_1 \vdash \text{‘}S_1 \text{ won the race’}]^{S_1} \rangle]$

A function that updates the last CSp of a CSD.

3.3 Reactions to assertion

Assertions have two effects:

- Conventional effect: Adding commitment to proposition
- Conversational implicature: Adding proposition

(18) $\langle ..., C^{*}\rangle +^{S_1} S_1 \vdash \varphi \; +^{S_1} \varphi$
$= \langle ..., C^{*}, [C + S_1 \vdash \varphi]^{S_1}, [C + S_1 \vdash \varphi + \varphi]^{S_1}\rangle$

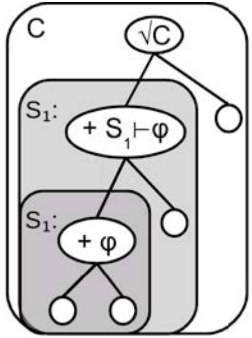


Figure 6:
Assertion of φ, followed by conventional implicature φ

Reactions to assertions:

(19) S_1: [$_{\text{ActP}}$ [[.] [$_{\text{CmP}}$ [[⊢] [$_{\text{TP}}$ *I won the race*]]]]] — introduction of propositional
$\hookrightarrow \varphi$ — discourse referent φ

S_2: (*Okay.*) $+_{S_2} \varphi$ — acknowledgement of φ
S_2: *Yes.* $+_{S_2} S_2 \vdash \varphi$ — assert φ
S_2: *No.* $+_{S_2} S_2 \vdash \neg\varphi$ — assert negation of φ, requires retraction

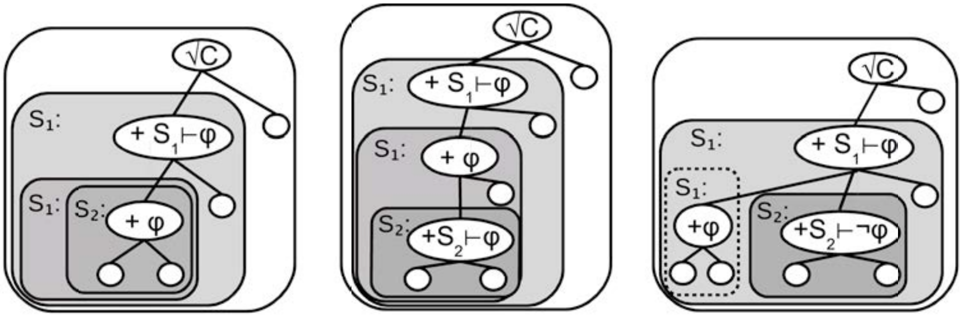


Figure 7: Acknowledgement (*okay*), Confirmation (*yes*) and Contradiction (*no*) of an assertion

4 Questions

4.1 Questions as meta speech acts

Questions as Common Ground Management:

- They determine how the common ground should develop
- Preferred development: Addressee answers the question

(20) $\langle ..., C^* \rangle + S_1$ to S_2: *Did I win the race?*
$= \langle ..., C^*, [\{\sqrt{C}\} \cup C + S_2 \vdash \varphi \cup C + S_2 \vdash \neg\varphi]^{S_1} \rangle$

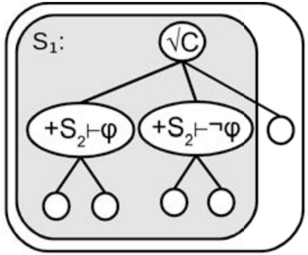


Figure 8: Bipolar question

Possible reactions to polar question:

(21) a. (20) + S_2: *Yes.* $= (20) +^{S_2} S_2 \vdash \varphi$

b. (20) + S_2: *No.* $= (20) +^{S_2} S_2 \vdash \neg\varphi$

(22) (20) $+^{S_2} \mathfrak{R} +^{S_2} S_2$: *I don't know.* =
$\langle ..., C^*, [\{\sqrt{C}\} \cup C + S_2 \vdash \varphi \cup C \cup S_2 \vdash \neg\varphi]_{S_1}, C^{S_2}, [C + S_2 \vdash$ '$\neg S_2$ knows whether φ'$]^{S_2} \rangle$

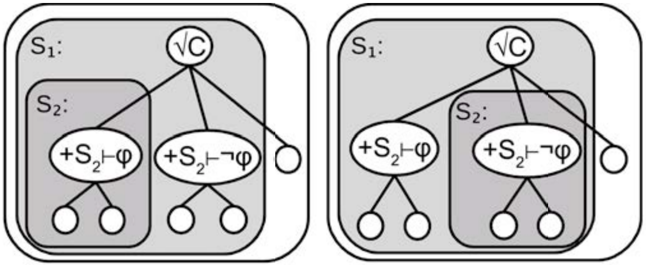


Figure 9:
Answers *yes* and *no* to bipolar question

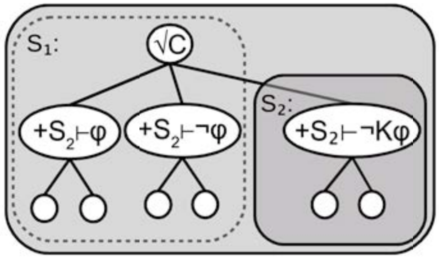


Figure 10:
Rejection of bipolar question

4.2 Monopolar questions

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

Candidates for monopolar questions:

(23) 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?*)

(24) $\langle ..., C^{*}\rangle + S_1$, to S_2: *I won the race?*
$= \langle ..., C^{*}, [\{\surd C\} \cup C + S_2 \vdash \varphi]^{S_1}\rangle$

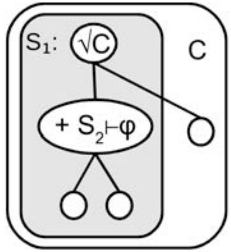


Figure 11: Monopolar (biased) question

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).

4.3 Derivation of monopolar questions

ActP head ? creates a meta speech act (requests to commit to proposition):

(25) $[\![[_{\text{ActP}}\,[[_{\text{Act}^\circ}\ ?\ \textit{Did}\ ]\ [_{\text{CmP}}\ [[_{\text{Cm}^\circ} \vdash t_{did}\ ]\ [_{\text{TP}}\ \textit{I}\ t_{did}\ \textit{win the race}]]]]]]\!]^{S_1S_2}$

$= [\![[_{\text{Act}^\circ}\ ?\ ]]\!]^{S_1S_2}([\![[[_{\text{Cm}^\circ} \vdash]\ [_{\text{TP}}\ \textit{I did win the race}]]]\!]^{S_1S_2})$

$= [\![[_{\text{Act}^\circ}\ ?\ ]]\!]^{S_1S_2}([\![[_{\text{Cm}^\circ} \vdash]]\!]^{S_1S_2}([\![[_{\text{TP}}\ \textit{I did win the race}]]\!]^{S_1S_2}))$

with	$[\![[_{\text{TP}}\ \textit{I won the race}]]\!]^{S_1S_2}$ = 'S_1 won the race'	proposition
	$[\![[_{\text{Cm}^\circ} \vdash]]\!]^{S_1S_2} = \lambda p \lambda S[S \vdash p]$	head of CmP, same as assertion
	$[\![[_{\text{Act}^\circ}\ ?\ ]]\!]^{S_1S_2}$ $= \lambda R \lambda\langle ..., C^*\rangle[\langle ..., C^*, [\{\surd C\} \cup C + R(\mathbf{S_2})]^{S_1}\rangle]$	head of ActP, applies CmP to **addressee**

$= \lambda\langle ..., C^*\rangle$
$[\langle ..., C^*, [\{\surd C\} \cup C + S_2 \vdash \text{'}S_1 \text{ won the race'}]^{S_1}\rangle]$ — monopolar question

4.4 Commitment Phrases in Conjunct/Disjunct systems

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

(26) Assertions | Questions

Assertions	Questions
a. *jī: a:pwa twan−**ā**.* 1.SG.ERG much drink-PST.**CJ** 'I drank a lot.'	*jī: a:pwa twan−**a**-la.* '1.SG.ERG much drink-PST.**DJ**-Q 'Did I drink a lot?'
b. *chā a:pwa twan−**a**.* 2. SG.ERG much drink-PST.**DJ** 'You drank a lot'	*chā a:pwa twan−**ā**-la.* 2.SG.ERG much drink-PST.**CJ**-Q 'Did you drink a lot?'
c. *wā: a:pwa twan−**a**.* 3. SG.ERG much drink-PST.**DJ** 'he/she drank a lot'	*wā: a:pwa twan−**a**-la.* '3. SG.ERG much drink-PST.**DJ**-Q 'Did he/she drank a lot?'

Proposal: CJ if Committer = Subject, DJ if Committer ≠ Subject

(27) $[\![\text{CJ}]\!]^{S_1 S_2} = \lambda P \lambda x \lambda S.S{=}x[S \vdash P(x)]$ $[\![\text{DJ}]\!]^{S_1, S_2} = \lambda P \lambda x \lambda S.S{\neq}x[S \vdash P(x)]$

For 3rd pers. subjects in commitment reports; embedded assertions (cf. Krifka 2015):

(28)

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.'

4.5 Disjunctive questions

(29) *Did Ed meet Ánn, or did Ed meet Béth?* raising accent (question)

Proposal: Question disjunction

(30) $[\![[_{\text{ActP}} [_{\text{ActP}}$ *Did Ed meet Ann*$]$ *or* $[_{\text{ActP}}$ *Did Ed meet Beth*$]]]\!]^{S_1 S_2}$

with $[\![[_{\text{ActP}}$ *Did Ed meet Ann*$]]\!]^{S_1 S_2} = \lambda\langle ..., C^*\rangle[\langle ..., C^*, [\{\surd C\} \cup C + S_2 \vdash \text{'Ed met Ann'}]^{S_1}\rangle]$

and $[\![[_{\text{ActP}}$ *Did Ed meet Beth*$]]\!]^{S_1 S_2} = \lambda\langle ..., C^*\rangle[\langle ..., C^*, [\{\surd C\} \cup C + S_2 \vdash \text{'Ed met Beth'}]^{S_1}$

and $[\![$*or*$]\!]^{S_1 S_2} = \mathrm{V}$

$= \lambda R \lambda R'[\langle R[1] \cup R'[1], R[2] \cup R'[2], \ldots R[\text{fin}] \cup R'[\text{fin}]\rangle]$ pointwise union

$= \lambda R \lambda R'[\langle R[1], R[2], ..., [R[\text{fin}](C^*) \cup R'[\text{fin}](C^*)]^{S_1}\rangle]$ R, R′ same up to [fin-1]

$= \lambda\langle ..., C^*\rangle[\langle ..., C^*, [[\{\surd C\} \cup C + S_2 \vdash \text{'Ed met Ann'}] \cup$
$[\{\surd C\} \cup C + S_2 \vdash \text{'Ed met Beth'}]]^{S_1}\rangle]$

$= \lambda\langle ..., C^*\rangle[\langle ..., C^*, [[\{\surd C\} \cup C + S_2 \vdash \text{'Ed met Ann'} \cup C + S_2 \vdash \text{'Ed met Beth'}]]^{S_1}\rangle]$

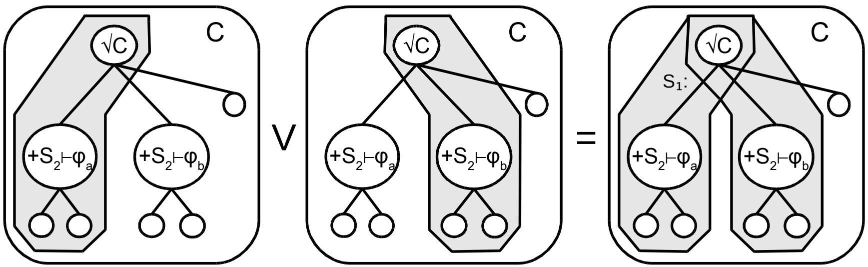


Figure 12: Disjunctive question as disjunction of two monopolar questions

4.6 Alternative (disjunctive) questions

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

(31) S_1 to S_2: *Did I win the race, or not?*

$= [\![[_{ActP}\ \textit{Did I win the race}]]\!]^{S_1S_2}$

$\vee\ [\![[_{ActP}\ \textit{did I not win the race}]]\!]^{S_1S_2}$

$= \lambda\langle ..., C^*\rangle$

$[\langle ..., C^*, [\{\surd C\} \cup C + S_2 \vdash \text{'}S_1 \text{ won the race'}]$

$\cup\ [\{\surd C\} \cup C + S_2 \vdash \neg\text{'}S_1 \text{ won the race'}]^{S_1}\rangle]$

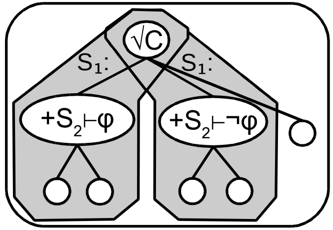


Figure 13:
Disjunction of monopolar questions

Simple answer *yes / no* avoided,
as there are two propositional discourse referents:

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

$\hookrightarrow \varphi$ $\qquad \hookrightarrow \neg\varphi$

Cf. disjunctive formation of bipolar questions in Mandarin:

(33) a. monopolar question:

Nǐ chí píngguo ma?
you eat apple QUEST
'Do you eat apples?', 'You eat apples?'

b. bipolar question:

Nī chí bu chí píngguo?
you eat not eat apple
'Do you eat apples (or not)?'

4.7 Constituent Questions as disjunctive questions

(34) 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:

(35) $[\![[_{ActP}\ [_{DP}\ \textit{which woman}]_i\ [_{Act'}\ [_{Act^o}\ ?\text{-}\textit{did}]\ [_{CmP}\ [[_{Cm^o}\ \vdash]\ [_{TP}\ \textit{Ed}\ t_{did}\ \textit{meet}\ t_i]]]]]]\!]^{S_1S_2}$

$= [\![[_{DP}\ \textit{which woman}]]\!]^{S_1S_2}(\lambda x_i\ [\![[_{Act'}\ [_{Act^o}\ ?\text{-}\textit{did}]\ [_{CmP}\ [[_{Cm^o}\ \vdash]\ [_{TP}\ \textit{Ed}\ t_{did}\ \textit{meet}\ t_i]]]]]\!]^{S_1S_2,t_i/x_i})$

with $[\![[_{DP}\ \textit{which woman}]]\!]^{S_1S_2} = \lambda R \bigvee_{x\in[\![\textit{woman}]\!]} [R(x)]$

and $\lambda x_i\ [\![[_{Act'}\ [_{Act^o}\ ?\text{-}\textit{did}]\ [_{CmP}\ [[_{Cm^o}\ \vdash]\ [_{TP}\ \textit{Ed}\ t_{did}\ \textit{meet}\ t_i]]]]]\!]^{S_1S_2,t_i/x_i}$

$= \lambda x_i\ \lambda\langle ..., C^*\rangle[\langle ..., C^*, [\{\surd C\} \cup C + S_2\vdash\text{'Ed met } x_i\text{'}]^{S_1}\rangle]$

$= \lambda\langle ..., C^*\rangle[\langle ..., C^*, [\{\surd C\} \cup \bigcup\{C + S_2\vdash\text{'Ed met } x_i\text{'} \mid x_i\in\text{woman}\}]^{S_1}\rangle]$

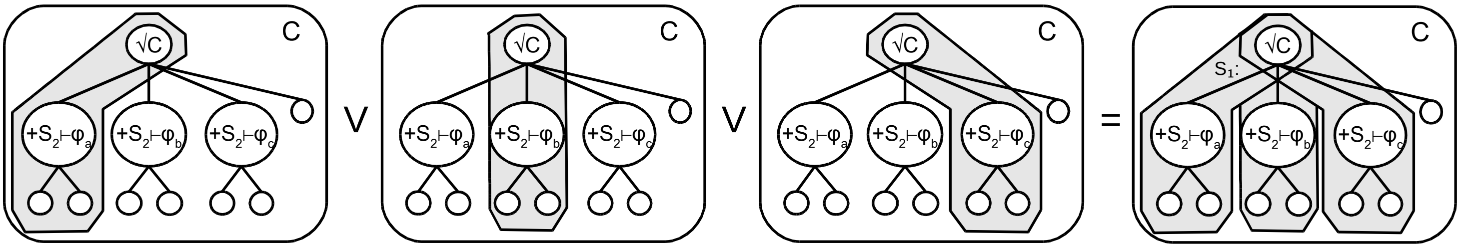


Figure 14: Constituent question *Which woman did Ed meet?* as disjunction of monopolar questions.

5 Focus in Answers and Questions

5.1 Focus in Answers

(36) a. S_1: *Who met Ann?* S_2: [*ED*]$_F$ *met Ann.*
b. S_1: *Who did Ed meet?* S_2: *Ed met* [*ANN*]$_F$

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

(37) $[\![[_{ActP}$ *Ed met* $[ANN]_{F}.]]\!]^{S_2S_1}$ (with alternatives Ann, Beth, Carla):'
meaning: $\lambda\langle ...,C^{*}\rangle[\langle ...,C^{*}, [C + S_2 \vdash \text{'Ed met Ann'}]\rangle]$
alternatives: $\{\lambda\langle ..., C^{*}\rangle[\langle ..., C^{*}, [C + S_2 \vdash \text{'Ed met Ann'}]^{S_2}\rangle],$
$\lambda\langle ..., C^{*}\rangle[\langle ..., C^{*}, [C + S_2 \vdash \text{'Ed met Beth'}]^{S_2}\rangle],$
$\lambda\langle ..., C^{*}\rangle[\langle ..., C + S_2 \vdash \text{'Ed met Carla'}]^{S_2}\rangle]\}$

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

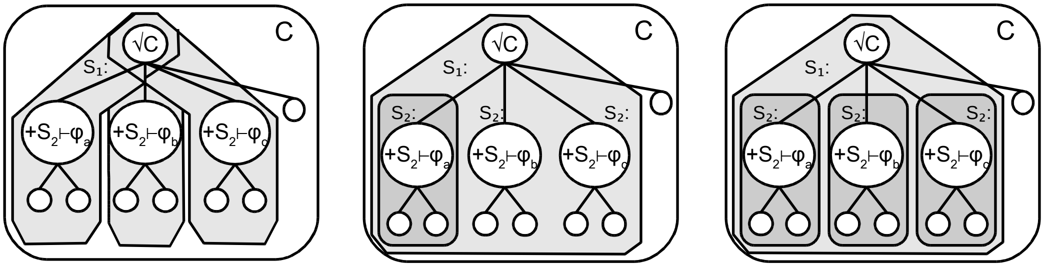


Figure 15: (a) Meaning of question, (b) meaning of answer, (c) alternatives of answer

5.2 Focus in questions

Here: Focus in monopolar questions.

(38) S_1: *Did Ed meet [ÁNN]$_F$?* S_2: Yes. rising accent
S_2: *#No.* / *No, he met [BETH]$_F$.*

Focus indicates alternative monopolar question:

(39) $[\![[_{ActP}$ *Did Ed meet [ÁNN]$_F$?*$]]\!]^{S_1 S_2}$ (with alternatives Ann, Beth, Carla)
meaning: $\lambda\langle..., C^*\rangle[\langle..., C^*, [\{\surd C\} \cup C + S_2 \vdash \text{'Ed met Ann'}]^{S_1}\rangle]$
alternatives: $\{ \lambda\langle..., C^*\rangle[\langle..., C^*, [\{\surd C\} \cup C + S_2 \vdash \text{'Ed met Ann'}]^{S_1}\rangle],$
$\lambda\langle..., C^*\rangle[\langle..., C^*, [\{\surd C\} \cup C + S_2 \vdash \text{'Ed met Beth'}]^{S_1}\rangle]$
$\lambda\langle..., C^*\rangle[\langle..., C^*, [\{\surd C\} \cup C + S_2 \vdash \text{'Ed met Carla'}]^{S_1}\rangle]\}$

The alternatives form the background of the question, which is accommodated;
if question is answered negatively, this background question remains.

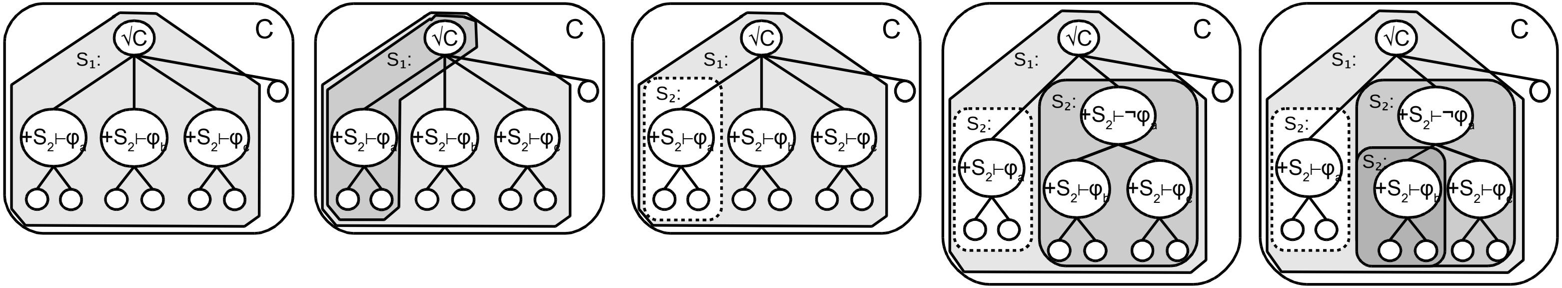


Figure 16: (a) Background of question, (b) question, (c) rejection, (d) assertion of negated proposition, (e) assertion of other proposition

5.3 Phrasal alternative questions

(40) *Did Ed meet ÁNN, BÉTH, or CÀRla?*

- Focus on $[_{DP}$ *Ann, Beth, or Carla*$]$ leads to set of CmPs as meaning
- There is an interpretation of the question operator ? that takes sets of CmPs and turns them into a disjunction.
- Result: Alternative question is interpreted like a wh constituent question: *Who did Ed meet? Ann, Beth, or Carla?*

(41) a. $[\![[_{CmP}\ [[_{Cm^o} \vdash \textit{did}\ ]\ [_{IP}\ \textit{Ed}\ t_{did}\ \textit{meet}\ [\text{ ANN, BETH, or CARla}]_{Foc}\ ]]]]]\!]^{S_1 S_2}$

Meaning: {λS[S⊢'Ed met Ann'], λS[S⊢Ed met Beth', λS[S⊢'Ed met Carla']}

b. $[\![[_{ActP}\ [[_{Act^o}\ ??]\ [_{CmP}\ [[_{Cm^o} \vdash \textit{did}\ ]\ [_{IP}\ \textit{Ed}\ t_{did}\ \textit{meet}\ [\text{ ANN, BETH, or CARla}]_{Foc}\ ]]]]]]]\!]^{S_1 S_2}$

$= [\![[_{Act^o}\ ??\ ]]\!]^{S_1 S_2}([\![[_{CmP}\ [[_{Cm^o} \vdash \textit{did}\ ]\ [_{IP}\ \textit{Ed}\ t_{did}\ \textit{meet}\ [\text{ ANN, BETH, or CARla}]_{Foc}\ ]]]]]\!]^{S_1 S_2})$

with $[\![[_{Act^o}\ ??\ ]]\!]^{S_1 S_2} = \lambda \underline{R}\ \lambda\langle ..., C^*\rangle[\langle ..., C^*, [\bigvee_{R \in \underline{R}} [\{\surd C\} \cup C{+}R(S_2)]]^{S_1}\rangle]$

$= \lambda\langle ..., C^*\rangle\ [\langle ..., C^*, [\bigvee_{R\ \in\ \{\lambda S[S\vdash\text{'Ed met Ann'}],\ \lambda S[S\vdash\text{Ed met Beth'},\ \lambda S[S\vdash\text{'Ed met Carla'}]\}} [\{\surd C\} \cup C{+}R(S_2)]]^{S_1}\rangle]$

$= \lambda\langle ..., C^*\rangle\ [\langle ..., C^*, [\ \{\surd C\}\ \cup S_2\vdash\text{'Ed met Ann'}$
$\cup\ S_2\vdash\text{'Ed met Beth'}$
$\cup\ S_2\vdash\text{'Ed met Carla'}\ ]^{S_1}\rangle]$

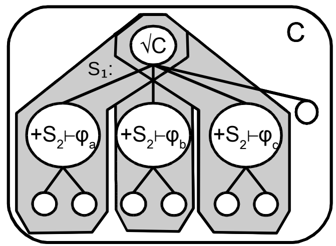


Figure 17: Alternative question

6 Questions with Polarity Phrases

6.1 Polarity Phrase

Has been invoked in case of verum focus:

(42) A: *I don't believe that you won the race.* B: *I DID win the race.*

Proposed syntactic structure:

(43) $[_{PolP}\ I\ [\ [_{Pol^o}$ pol - *did*$]\ [_{IP}\ t_I\ t_{did}$ *win the race*$]]]]$

Semantic contribution of pol:
Meaning redundant, hence always introduces alternatives.

(44) a. Meaning: $\lambda p[p]$ (identity function)
b. Alternatives: $\{\lambda p[p], \lambda p[\neg p]\}$

(45) $[\![[_{PolP}\ [\ [_{Pol^o}$ pol - *did*$]\ [_{IP}\ I\ t_{did}$ *win the race*$]]]]\!]^{S_1 S_2}$
$= [\![[_{Pol^o}$ pol$]]\!]^{S_1 S_2}([\![[_{IP}\ I\ t_{did}$ *win the race*$]]\!]^{S_1 S_2})$

Meaning: 'S_1 won the race'
Alternatives: {'S_1 won the race', ¬'S_1 won the race'}

Q/A congruence to bipolar question:

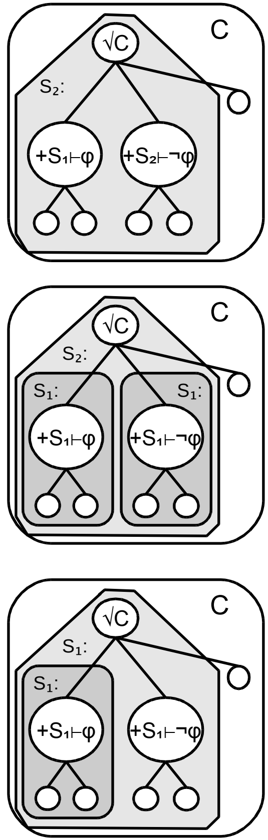
(46) S_2: *Did you win the race, or not?*
S_1: *I DID win the race.*

Figure 18:

(a) Bipolar question

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

(c) Answer



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) S_1: *DID I win the race?*

This can be derived by assuming a polarity phrase in the question,
which necessitates the ?? question operator that refers to alternatives.

(48) $[_{\text{ActP}}\ [[_{\text{Act}^\circ}\ ??]\ [_{\text{CmP}}\ [[_{\text{Cm}^\circ}\ \vdash\text{-}\textit{did}]\ [_{\text{PolP}}\ [[_{\text{Pol}^\circ}\ \text{pol-}t_{\textit{did}}]\ [_{\text{TP}}\ \textit{I}\ t_{\textit{did}}\ \textit{win the race}]]]]]]]$

Interpretation of CmP:

(49) $[\![[_{\text{CmP}}\ [[_{\text{Cm}^\circ}\ \vdash\text{-}\textit{did}]\ [_{\text{PolP}}\ [[_{\text{Pol}^\circ}\ \text{pol-}t_{\textit{did}}]\ [_{\text{TP}}\ \textit{I}\ t_{\textit{did}}\ \textit{win the race}]]]]]]\!]^{S_1 S_2}$
Meaning: $\lambda S[S \vdash \text{‘}S_1 \text{ won the race’}]$
Alternatives: $\{\lambda S[S \vdash \text{‘}S_1 \text{ won the race’}], \lambda S[S \vdash \neg\text{‘}S_1 \text{ won the race’}]\}$

Derivation of question:

(50) $[\![??]\!]^{S_1 S_2}\ (\{\lambda S[S \vdash \text{‘}S_1 \text{ won the race’}], \lambda S[S \vdash \neg\text{‘}S_1 \text{ won the race’}]\})$
with $[\![??]\!]^{S_1 S_2} = \lambda \underline{R}\ \ \lambda\langle ..., C^*\rangle[\langle ..., C^*, [\bigvee_{R \in \underline{R}} [\{\surd C\} \cup C{+}R(S_2)]]^{S_1}\rangle]$
$= \lambda\langle ..., C^*\rangle[\langle ..., C^*, [\{\surd C\} \cup C{+}S_1 \vdash \text{‘}S_1 \text{ won the race’} \cup C{+}S_1 \vdash \neg\text{‘}S_1 \text{ won the race’}]^{S_1}\rangle]$

6.3 Quasi-bipolar interpretations as focused questions

In the derivation above we assumed that the ?? operator uses the alternatives introduced by the pol operator.

A second option: The alternatives project to the ActP; raising accent

(51) $[\![[_{ActP} [[_{Act^o}$?-*DID*] $[_{CmP\flat} [[_{Cm^o} \vdash t_{did}] [_{PolP} [[_{Pol^o}$ pol- $t_{did}]$ [*/* t_{did} *win the race*]]]]]]]]$]\!]^{S_1 S_2}$
Meaning: $\lambda\langle ..., C^*\rangle[\langle ..., C^*, [\{\surd C\} \cup C + S_2 \vdash$ 'I won the race'$]^{S_1}\rangle]$
Alternatives: { $\lambda\langle ..., C^*\rangle[\langle ..., C^*, [\{\surd C\} \cup C + S_2 \vdash$ 'I won the race'$]^{S_1}\rangle]$,
$\lambda\langle ..., C^*\rangle[\langle ..., C^*, [\{\surd C\} \cup C + S_2 \vdash \neg$'I won the race'$]^{S_1}\rangle]$}

(52) S_2: *Yes, you did.*
$\lambda\langle ..., C^*\rangle[\langle ..., C^*, [C + S_2 \vdash$ 'S_1 won the race'$]^{S_2}\rangle]$

(53) S_2: *No, you didn't.*
Requires prior retract operation, then assertion of the only alternative left.
then $\lambda\langle ..., C^*\rangle[\langle ..., C^*, [C + S_2 \vdash \neg$'$S_1$ won the race'$]^{S_2}\rangle]$

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

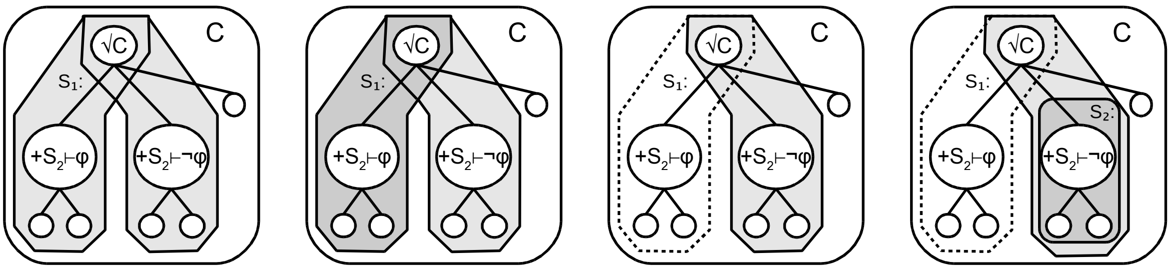


Figure 19: (a) Alternatives of question, (b) Question, (c) Rejection, (d) Assertion of remaining alternative

7 Negated Questions

7.1 Monopolar question with propositional negation:

(54) $[\![[_{ActP} [[_{Act^o}$? *Did*] $[_{CmP} [[_{Cm^o} \vdash t_{did}$] $[_{TP}$ *I* [*not* $[_{TP} t_I\, t_{did}$ *win the race*]]]]]] $]\!]^{S_1 S_2}$

$\lambda\langle ..., C^*\rangle[\langle ..., C^*, [\{\sqrt{C}\} \cup C + S_2 \vdash \neg$‘$S_1$ won the race’$]^{S_1}\rangle]$

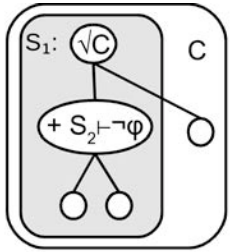


Figure 20: Monopolar (biased) question

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: $\{p, \neg p\} = \{\neg p, \neg\neg p\}$
- 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).

7.2 Monopolar question with high negation

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

(55) $⟦[_{ActP}[[_{Act°}$? *Did*$]$ $[_{CmP}$ *n't* $[[_{Cm°}\vdash]$ $[_{TP}$ *I* t_{did} *win the race*$]]]]]⟧^{S_1S_2}$

$= ⟦[_{Act°}\ ?]⟧^{S_1S_2}(⟦\textit{not}⟧^{S_1S_2}(⟦\vdash⟧^{S_1S_2}(⟦[_{TP}\ \textit{I did win the race}]⟧^{S_1S_2})))$

$= \lambda\langle ..., C^*\rangle[\langle ..., C^*, [\{\sqrt{C}\} \cup C + \neg S_2\vdash\varphi]^{S_1}\rangle]$

- With this move, S_1 asks S_2 to express non-commitment towards the proposition φ.
- Notice that adding $\neg S_2\vdash\varphi$ to the CSp precludes commitment to φ, i.e., $S_2\vdash\varphi$,
but is compatible with commitment to ¬φ, i.e., $S_2\vdash\neg\varphi$.
- Hence, $\neg S_2\vdash\varphi$ is pragmatically weaker than $S_2\vdash\neg\varphi$: The former proposition does not force S_2 to also commit to ¬φ, whereas the latter proposition forces S_2 not to commit to φ, as it would be incompatible with $S_2\vdash\varphi$.

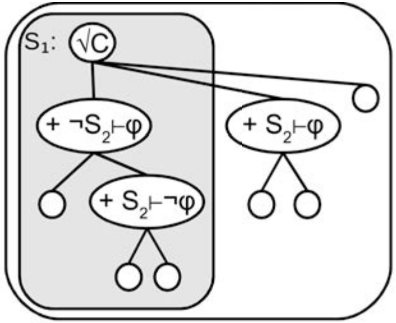


Figure 21: High negation question

Reactions to high negation questions:

- 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_2 being not committed to φ.

7.3 Questions of bias

A variety of expressing yes/no questions:

(56) a. $\{\surd C\} \cup C + [S_2 \vdash \varphi]^{S_1}$ monopolar question

$\{\surd C\} \cup C + [S_2 \vdash \neg\varphi]^{S_1}$ monopolar question, negated proposition

b. $\{\surd C\} \cup C + S_2 \vdash \varphi \cup C + [S_2 \vdash \neg\varphi]^{S_1}$ bipolar question

c. $\{\surd C\} \cup C + [\neg S_2 \vdash \varphi]^{S_1}$ high negation question

$\{\surd C\} \cup C + [\neg S_2 \vdash \neg\varphi]^{S_1}$ high negation question, negated proposition

Discussion of different kinds of biases:
Büring & Gunlogson 2000, Sudo 2013

Sudo discusses different kinds of bias:

- Evidential bias
- Epistemic bias

Evidential bias:

(57) [S_2 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?*

(58)
- a. Asking the monopolar question $S_2 \vdash \varphi$, if φ is likely, results in a smooth conversation (simple affirmation).
- b. Asking the monopolar question $S_2 \vdash \neg\varphi$ would result in a likely rejection, which should be avoided in smooth communication.
- c. Would also result in a likely rejection.
- d. Bipolar questions suggest that φ and ¬φ are equally likely, if φ is more likely, (a) is to be preferred.
- e. Checking whether S_2 would refrain from asserting φ is a rather complex move, appropriate only if φ is controversial.
- f. Also a bipolar question, focus on auxiliary indicates alternatives $\lambda p[p]$, $\lambda p[\neg p]$

Epistemic bias:

(59) S_2: *You must be starving. You want something to eat?*
S_1: *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:

- S_1 checks whether S_2 refrains from committing to the proposition φ, that is, whether S_2 is willing to add $\neg S_2 \vdash \varphi$ to the common ground.
- Rationale: S_1 has an epistemic tendency favoring φ and is interested whether the strength of this belief can be increased; S_1 considers S_2 as a possible independent source that may increase or decrease this believe.
- But S_1 does not want to impose the epistemic tendency for φ on S_2 by making asserting ¬φ an easy option, as with the biased question based on $S_2 \vdash \varphi$ (b).
- (a) does not force S_2 to commit to φ or ¬φ directly, but rather officially invites S_2 to refrain from a commitment for φ.
  Explains polite flavor of high negation questions.
- Makes it easier to answer negatively, by $S_2 \vdash \neg\varphi$; strategy of S_1 to maximize the chances for S_2 to actually commit to ¬φ.
  If S_2 against these odds commits to φ, then S_1 can assume that this commitment was not obtained by force.

8 Question tags

Matching and reverse question tags (Cattell 1973):

(60) *You are tired, are you?*

(61) a. *I have won the race, haven't I?*
b. *I haven't won the race, have I?*

8.1 Matching question tags

can be analyzed by speech act **conjunction**
of an assertion and a question

(62) *I have won the race, have I?*

$C +_{S_1} [⟦[_{ActP} [\ .\ ] [_{CmP} [\vdash] [_{TP}$ *I have won the race*$]]]⟧^{S_1 S_2}$ &
$⟦[_{ActP} [\ ?\ ] [_{CmP} [\vdash] [_{TP}$ *I have won the race*$]]]⟧^{S_1 S_2}]$

$= [C + S_1 \vdash \varphi] \cap [\{\surd C\} \cup C + S_2 \vdash \varphi]$

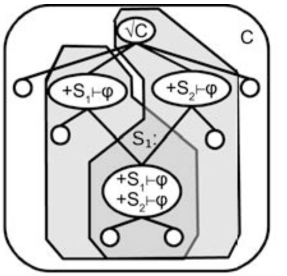


Figure 22:
Matching question tag

- The overall effect is that S_1 proposes to S_2 that both S_1 and S_2 are committed to the proposition φ.
- That is, S_1 proposes dark central area as new commitment space.
- S_1 can propose $S_2 \vdash \varphi$ because φ is understood as a commitment that S_2 has already anyway – Cattell: Voicing a likely opinion by the addressee.
- Hence: Evidential bias towards φ

8.2 Reverse question tags

can be analyzed as a speech act disjunction of an assertion and a question.

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

$C +_{S_1} [[\![[_{ActP}\ [\ .\ ]\ [_{CmP}\ [\vdash]\ [_{TP}\ \textit{I have won the race}]]]]\!]^{S_1S_2} \vee$

$[\![[_{ActP}\ [\ ?\ \textit{have'nt}\ ]\ [_{CmP}\ [\vdash\ ]\ [_{TP}\ [[t_{n't}]\ [_{TP}\ I\ t_{have}\ \textit{won the race}]]]]]\!]^{S_1S_2}]$

$= [C + S_1 \vdash \varphi] \cup [\{\surd C\} \cup C + S_2 \vdash \neg\varphi]$

- The resulting commitment space is the whole gray area.
- This excludes that S_2 is committed to φ but S_1 is committed to ¬φ.
- This means that if S_2 commits to φ, then S_1 is committed to φ as well.
- That is, S_1 puts forward a commitment to φ, asking S_2 for support.
- If S_2 does not provide this support by committing to ¬φ, S_1 is free to either stick with the commitment to φ, or to retract it and even assert ¬φ, without contradicting an earlier commitment.
- Epistemic bias towars φ, seeking confirmation

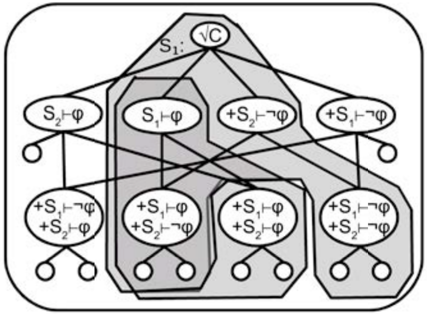


Figure 23: Reverse question tag

9 Embedded Questions (added)

9.1 Nature and kind of embedded questions

Questions also occur as embedded syntactic objects:

(64) a. *Who won the race?*
b. *Bill knows who won the race.*

But there are important differences between root and embedded questions:

(65)	a. *Who did Ed meet?*	**Who Ed met?*
	b. *Bill knows who Ed met.*	**Bill knows who did Ed meet.*
(66)	a. *Did Ed meet Beth?*	**Whether / if Ed met Beth?*
	b. *Bill knows whether / if Ed met Beth.*	**Bill knows did Ed meet Beth?*
(67)	a. *Did Ed meet Ann or Beth?*	**Whether Ed met Ann or Beth?*
	b. *Bill knows whether Ed met Ann or Beth.*	**Bill knows did Ed meet Ann or Beth?*
(68)	a. *Wen hat Ed denn getroffen?*	discourse particles in German
	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.

9.2 whether

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

(69) a. [$_{CP}$ [[$_{C°}$ *whether*] [$_{TP}$ *Ed met Ann*]]]

b. [$_{CP}$ [[$_{C°}$ *that*] [$_{TP}$ *Ed met Ann*]]]

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

- Monopolar: λp{p}
- Bipolar: λp{p, ¬p}

Evidence for monopolar operator: Disjunctions

(70) a. [$_{CP}$ [$_{CP}$ [[$_{C°}$ *whether*] |$_{TP}$ *Ed met Ann*]]] *or* [$_{CP}$ [[$_{C°}$ *whether*] [$_{TP}$ *he met Beth*]]]]

b. [$_{CP}$ [$_{CP}$ [[$_{C°}$ *whether*] |$_{TP}$ *Ed met Ann*]]] *or* [$_{CP}$ [[$_{C°}$ *whether*] [$_{TP}$ *he did not meet her*]]]]

c. [$_{CP}$ [[$_{C°}$ *whether or not*] [$_{TP}$ *Ed met Ann*]]]

d. [$_{CP}$ [[$_{C°}$ *whether*] [$_{TP}$ Ed met ANN, BETH or CARla]]]

(71) ⟦[[$_{CP}$ [[$_{C°}$ *whether*] |$_{TP}$ *Ed met Ann*]]] *or* [$_{CP}$ [[$_{C°}$ *whether*] [$_{TP}$ *he met Beth*]]]]⟧$^{S_1 S_2}$
= λp{p}[‘Ed met Ann’] ∨ λp{p}[‘Ed met Beth’]
= {‘Ed met Ann’} ∪ {‘Ed met Beth’}, = {‘Ed met Ann’, ‘Ed met Beth’}

Bipolar operator:

(72) ⟦[$_{CP}$ [[$_{C°}$ whether] [$_{TP}$ *Ed met Ann*]]]⟧$^{S_1 S_2}$
= λp{p, ¬p}(‘Ed met Ann’), = {‘Ed met Ann’, ¬‘Ed met Ann’}

9.3 Embedded Constituent Questions

Assumption for syntactic structure: Qu head

(73) a. $[_{CP}$ *who*$_i$ $[[_{C^o}$ Qu] $[_{TP}$ *Ed met* $t_i]]]$

b. $[_{CP}$ *wen* $[[_{C^o}$ *(<u>dass</u>)*] $[_{TP}$ *Ed* t_{wen} *getroffen hat*]]] (Southern German)

Qu is interpreted like *whether*, i.e. introduces singleton sets.

(74) $[\![[_{CP} [\textit{which woman}]_i\ [[_{C^o}\ \text{Qu}\ ]\ [_{TP}\ \textit{Ed met}\ t_i]]]]\!]^{S_1S_2}$

$= [\![\textit{which woman}]\!]^{S_1S_2}(\lambda x_i\ [[\![\text{Qu}]\!]^{S_1S_2}([\![[_{TP}\ \textit{Ed met}\ t_i]]\!]^{S_1S_2,t_i/x_i})])$

with $[\![[_{TP}\ \textit{Ed met}\ t_i]]\!]^{S_1S_2,t_i/x_i}$ = 'Ed met x_i'

and $[\![\text{Qu}]\!]^{S_1S_2} = \lambda p\{p\}$

and $[\![\textit{which woman}]\!]^{S_1S_2} = \lambda R \bigvee_{x\in[\![\textit{woman}]\!]S_1S_2} R(x)$

we have: $\bigvee_{x\in[\![\textit{woman}]\!]S_1S_2}$ {'Ed met x'}, = {'Ed met x' | $x\in[\![\textit{woman}]\!]^{S_1S_2}$}

Question-embedding *know* reduces to proposition-embedding *know*:

(75) $[\![\textit{know}]\!](Q)([\![\textit{Ed}]\!]) \Leftrightarrow \forall p\in Q[p \text{ is true} \rightarrow [\![\textit{know}]\!](p)([\![\textit{Ed}]\!])]$
'for every true proposition in the set of propositions, Ed knows that it is true.'

Notice: strong exhaustive interpretation when Qu is interpreted as $\lambda p\{p, \neg p\}$

9.4 Comparison: Wh in Root vs. embedded questions

Wh in embedded questions: Disjunctions of sets of propositions.

(76) a. $\{p\} \vee \{q\}$ $= \{p\} \cup \{q\}, = \{p, q\}$

b. $\lambda R\, [\bigvee_{x \in WH} R(x)]\ (\lambda y\, \{p(y)\})$ $= \bigcup_{x \in WH} \{p(x)\}$

Wh in root questions on the CSp level: Disjunctions of functions from CSp to CSp

(77) a. $\lambda C[\mathfrak{A}(C)]\ \mathrm{V}\ \lambda C[\mathfrak{B}(C)]$ $= \lambda C[\mathfrak{A}(C) \cup \mathfrak{B}(C)]$

b. $\lambda R\, [\bigvee_{x \in WH} R(x)]\ (\lambda y \lambda C[\mathfrak{A}(y)(C)])$ $= \lambda C\, [\bigcup_{x \in WH} \mathfrak{A}(x)]$

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 $[[e \rightarrow \{st\}] \rightarrow \{st\}]$
- 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*

(78) *Ed hat wen getroffen.* ‘Ed met someone’

(79) a. $p \vee q$ b. $\lambda P \bigvee_{x \in WH} P(x)\ (\lambda y[p(y)])$ *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:

(80) 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:

(81) a. *Wen hat Ed* <u>*denn*</u> *getroffen?*

b. *Ed weiß, wen er *denn getroffen hat.*

c. *Ed fragte sich, wen er* <u>*denn*</u> *getroffen hat / habe.*

Krifka (2015) 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)

(82) *Ed* [*wondered* [$_{\text{ActP}}$ *who did he meet*]]

(83) 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'

10 Conclusion

Goals of the talk:

- 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 (Krifka 2015)
- There are “monopolar” questions that project just one legal development; this can be used to model biased 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

The talk is based on:

- Krifka, Manfred. 2015. Bias in Commitment Space Semantics: Declarative questions, negated questions, and question tags. *Semantics and Linguistic Theory* (*SALT*) 25, 328-345. Washington, D.C.: LSA Open Journal Systems.

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