Projecting the Common Ground with Questions: Biases, Tags, and Alternatives

Conference Division of Labor:
A View from Syntax, Semantics, Information Structure, and Processing

22 – 23 January 2015

University of Tübingen

Manfred Krifka

krifka@rz.hu-berlin.de

Zentrum für Allgemeine Sprachwissenschaft, Berlin

Humboldt-Universität zu Berlin

Gefördert durch das BMBF

Gefördert durch die DFG (SFB 632)

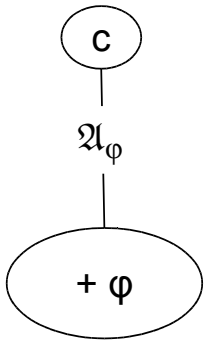
To be covered

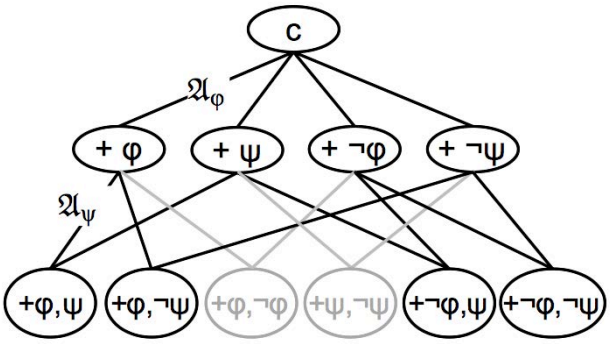
- A formal model for speech acts, in particular assertions and questions as a level of linguistic meaning (cf. Cohen & Krifka 2014),
- Distinctive features:
  - Speech acts change common ground (cf. Stalnaker 1974, …)
  - Common ground as a **permanent** record of **commitments**.
  - Common grounds have a **projective** component that determines its possible developments.
  - (The last two properties extend ideas of Farkas & Bruce 2011.)
- Phenomena to be discussed:
  - **Assertions** as **commitments** to a proposition.
  - **Questions as projected assertions** by the addressee.
  - **Monopolar questions**, projecting just one assertion, expressing **bias**.
  - Alternative and constituent questions as **question disjunctions**.
  - **High negation** questions and projected refusals of assertions.
  - **Question tags** as {con/dis}junctions of assertions and questions
  - **Focus in polarity questions** as indicating underlying broader question.

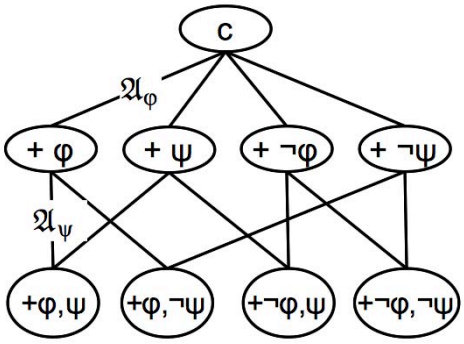
A Framework for Speech Acts

Basic notions

- Commitment States c
  - commitments publicly shared by the participants
  - modeled as set of propositions
- Update of commitment states c with speech act $\mathfrak{A}_\varphi$
  - $c + \mathfrak{A}_\varphi = c \cup \{\varphi\}$,
    where φ: the commitment introduced by speech act $\mathfrak{A}_\varphi$
- Update should be consistent, no blatant contradictions
  - Example: possible updates of c with φ, ψ and their negations

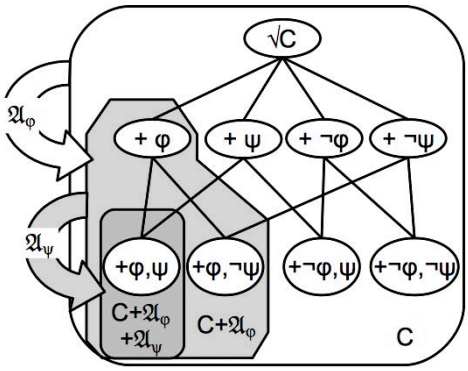


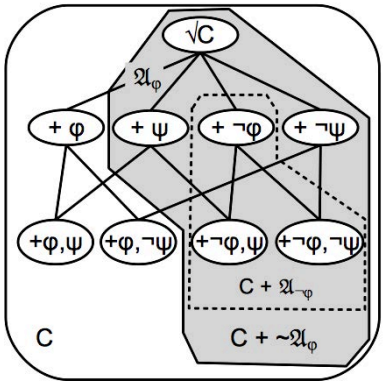




A Framework for Speech Acts

- Commitment Spaces C
  - captures ways
    how commitment state can develop
    ("common ground managing")
  - modeled as sets
    of consistent commitment states
  - with a smallest (nonempty) state ∩C
  - this is called the root of C, written √C
- Update of a commitment space C:
  $C + \mathfrak{A} = \{c \in C \mid \sqrt{C} + \mathfrak{A} \subseteq c\}$
- See example: $C + \mathfrak{A}_\varphi + \mathfrak{A}_\psi$
- Motivation (cf. Cohen & Krifka 2014):
  speech act denegation
  - Example: *I don't promise to come.*
  - $C + {\sim}\mathfrak{A} = C - [C + \mathfrak{A}]$

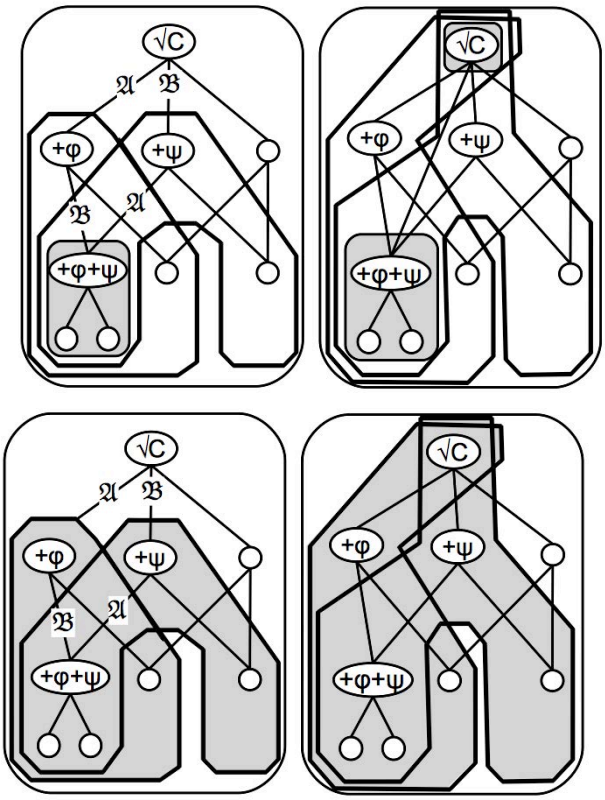




A Framework for Speech Acts

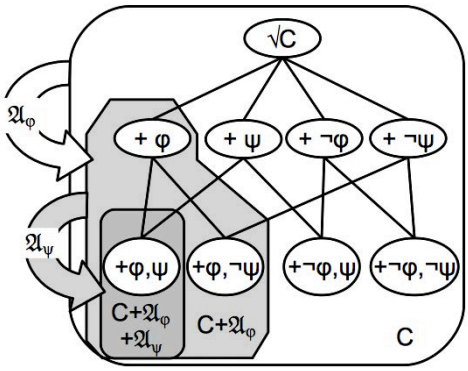
Other operations on speech acts

- Speech act conjunction:
  - $C + [\mathfrak{A} \,\&\, \mathfrak{B}] = [C + \mathfrak{A}] \cap [C + \mathfrak{B}]$
  - leads to rooted set of commitment states for speech acts and for meta speech acts
- Speech act disjunction:
  - $C + [\mathfrak{A} \,V\, \mathfrak{B}] = [C + \mathfrak{A}] \cup [C + \mathfrak{B}]$
  - leads to rooted set of commitment states only for meta speech acts
  - disjunction not readily defined for speech acts (Krifka 2001)



A Framework for Speech Acts

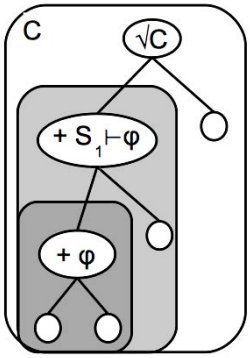
- Commitment Space Developments (CSDs)
  - A sequence of commitment spaces, $\langle C_0, C_1, \ldots C_n \rangle$
  - Update of a CSD with a (meta) speech act: $\langle C_0, C_1, \ldots C_n \rangle + \mathfrak{A} = \langle C_0, C_1, \ldots C_n, C_n + \mathfrak{A} \rangle$
  - Indicating the performer S of a speech act: $\langle \ldots, [C]_{\ldots} \rangle +_S \mathfrak{A} = \langle \ldots, [C]_{\ldots}, [C + \mathfrak{A}]_S \rangle$
- CSDs keep a record of the discourse development so far
- A way of modeling the rejection of a move of S_1 by S_2: $\langle \ldots, [C], [C']_{S_1} \rangle +_{S_2} \mathfrak{R} = \langle \ldots, [C], [C']_{S_1}, [C]_{S_2} \rangle$



Assertions

The logic of assertion

- The basic points of assertion:
  - Truth commitment:
    S declares responsibility for φ: $S \vdash \varphi$
  - Proposition sharing:
    S attempts to make φ common ground
- Nature of proposition sharing:
  - Conversational implicature of truth commitment
  - Evidence: Can be canceled.
    Believe it or not, Ed kissed Beth.
  - Based on social standing of speaker:
    # I don't believe it, but Ed kissed Beth.
- Modeling in terms of CSDs:
  - $\langle \ldots, [C]_{\ldots} \rangle +_{S_1} S_1 \vdash \varphi +_{S_1} \varphi$
    $= \langle \ldots, [C]_{\ldots},$
    $[C + S_1 \vdash \varphi]_{S_1},$ truth commitment,
    $[C + S_1 \vdash \varphi + \varphi]_{S_1} \rangle$ proposition sharing

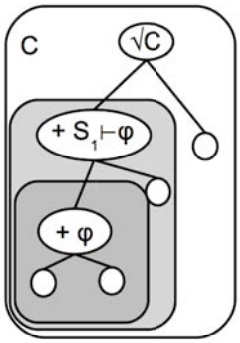


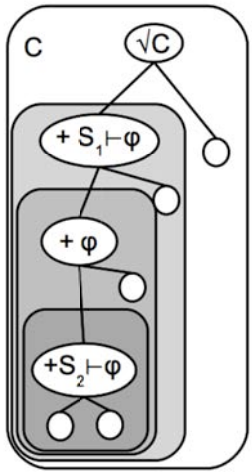
Assertions

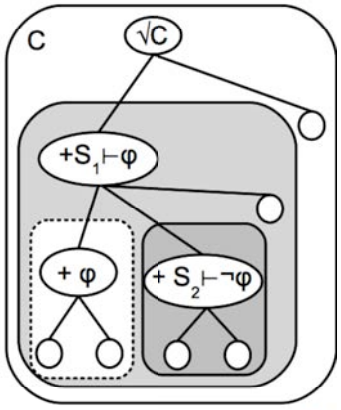
Derivation of assertions

- Truth commitment by assertion operator "▪"
  - that applies to a proposition (TP)
  - and creates a function that takes an input CSD, delivers output CSD
- Possible syntactic implementation in an ActP:
  - $[\![[_{Act'} [_{Act^0} \blacksquare\ ] [_{TP}$ *Ed met Beth*$]]]\!]^{S_1S_2}$
    $= [\![[_{Act^0} \blacksquare]]\!]^{S_1S_2} ([\![[_{TP}$ *Ed met Beth*$]]\!]^{S_1S_2})$
    $= \lambda p\, \lambda\langle \ldots, [C]_{\ldots} \rangle\, [\langle \ldots, [C]_{\ldots}, [C + S_1 \vdash p]_{S_1} \rangle]([\![[_{TP}$ *Ed met Beth*$]]\!]^{S_1S_2})$
    $= \lambda\langle \ldots, C \rangle\, [\langle \ldots, [C]_{\ldots}, [C + S_1 \vdash [\![[_{TP}$ *Ed met Beth*$]]\!]^{S_1S_2}]_{S_1} \rangle]$
    $= +_{S_1} S_1 \vdash \varphi_b$, for short, when applying to a CSD
- Realization of assertion:
  - Syntactically, e.g. V2 in German (Truckenbrodt 2006)
  - Inflectionally, e.g. assertive mood marking on finite verb in Japanese, Greenlandic (König & Siemund 2007)
  - Prosodically, e.g. H* L% (Bartels 1997)
  - Combination of means, possibly indicating subtypes (Altmann 1993)

Assertions







Reactions to assertions

- The truth commitment + $S_1 \vdash \varphi$:
  immune to grammaticalized reactions
  (but: *Don't say that!*)
- Proposition sharing + φ:
  - Acceptance, recognition of information:
    Aha. / Okay. / No reaction.
  - Making the same commitment: *Yes.*
    S_2 *p*icks up propositional discourse referent
    of assertion, asserts it.
  - Rejecting: *No.*
    S_2 picks up propositional discourse referent,
    rejects the last move
    (as φ and $S_2 \vdash \neg\varphi$
    cannot both be in a commitment state),
    asserts its negation.

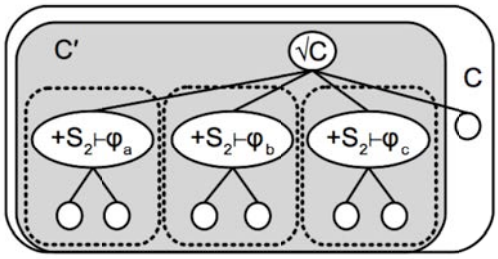
Questions

Basic idea:

- Question speech acts as projected assertions by the other speaker,
- to be modeled as meta speech acts, as the root does not change.

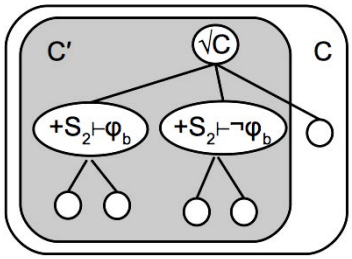
Types of questions:

- Constituent question, e.g.
  - S_1 asking S_2: *Who did Ed meet?*,
  - S_1 restricts future moves of S_2
    where φ_a: 'Ed met Ann',
    φ_b: 'Ed met Beth',
    φ_c: 'Ed met Carla'

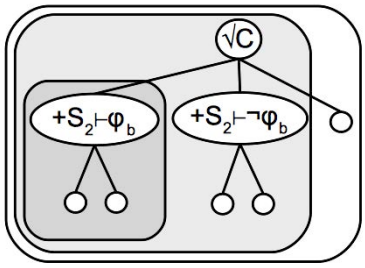


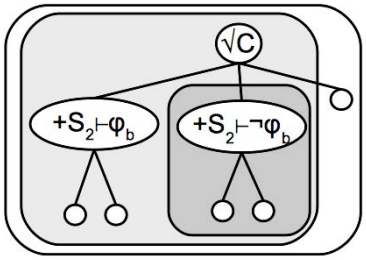
  - Congruent reaction: S_2 makes one of the indicated assertions.
  - Non-congruent reaction, e.g. *I don't know* possible after rejection
- Alternative questions: similar meaning
  - Example: *Did Ed meet Ann, Beth, or Carla?*

Questions



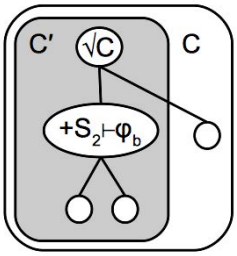
- Polar question (bipolar), e.g.
  - S_1 asking S_2: *Did Ed meet Beth (or not)?*
  - S_1 restricts future moves of S_2 to assertion of proposition and assertion of its negation.
- Congruent reaction:
  - S_2 makes one of the indicated assertions,
  - Answer *yes* : Picking up propositional discourse referent φ_b, asserting it.
  - Answer *no*: Picking up propositional discourse referent φ, asserting its negation.
- No reject operation required.



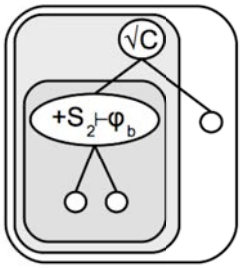


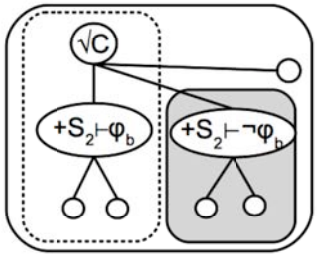
Questions

Polar questions with a bias



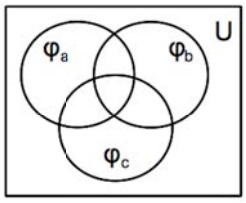
- E.g., declarative question: *Ed met Beth?*
- S_1 offers S_2 only one assertion: **monopolar** question
- Expresses biased towards that answer.
  - Reaction *yes* makes that assertion,
  - simpler than in the bipolar case, as there is only one option.
  - Reaction *no* requires prior reject operation, not as straightforward as *yes*.
- Natural representation of question bias:
  - Difference between one or two projected assertions
  - On other accounts, e.g. Hamblin or Inquisitive Semantics, question bias expressed by extraneous means.



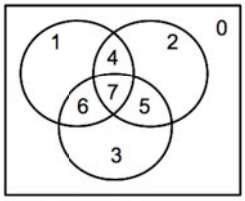


Questions

Derivation of question acts, first option:

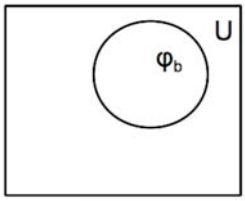


- Question radical as set of propositions, as used in embedded questions
- Constituent question:
  - $[\![[_{CP}\ \textit{who}\ [_{TP}\ \textit{Ed met}\ t_{who}]]]\!]^{S_1S_2}$ = {λi[Ed met x in i] | x∈PERSON}, = $\{\varphi_a, \varphi_b, \varphi_c\}$

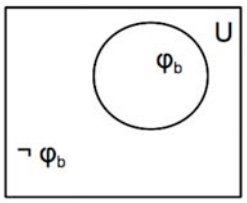


$\overline{\cap}\{\varphi_a,\varphi_b,\varphi_c\}$

  - Pragmatic exhaustification of a set of propositions P: $\overline{\cap}P = \{p|\exists P' \subseteq \overline{P}[p=\cap P' \wedge p\neq\varnothing \wedge \neg\exists P'' \subseteq \overline{P}[\cap P'' \subset p]]\}$, where $\overline{P} = \{p|p\in P \vee \overline{p}\in P\}$
  - Strong interpretation: $\overline{\cap}\{\varphi_a, \varphi_b, \varphi_c\}$



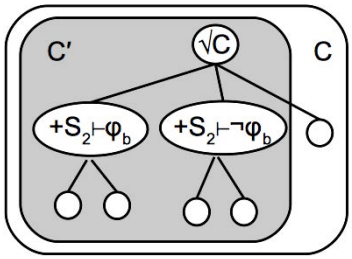
- Polarity question:
  - Monopolar reading as basic $[\![[_{CP}\ \textit{whether}\ [_{TP}\ \textit{Ed met Beth}]]]\!]$ = $\{[\![[_{TP}\ \textit{Ed met Beth}]]\!]\}$, = $\{\varphi_b\}$



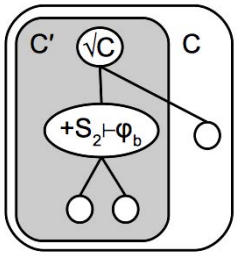
  - Bipolar reading after exhaustification: $\overline{\cap}\{\varphi_b\} = \{\varphi_b, \neg\varphi_b\}$

Questions

- Derivation of question by operator "?"
  - $\langle ..., [C]_{...} \rangle +_{S_1} [\![[_{ActP}\ [[?]\ [_{CP}\ ...]]]]\!]^{S_1S_2}$ = $\langle ..., [C]_{...}, [\cup\{\{\sqrt{C}\} + S_2 \vdash p \mid p\in[\![[_{CP}\ ...]]\!]^{S_1S_2}\}]_{S_1} \rangle$
  - S_1 proposes to S_2 to declare responsibility for one of the propositions in the CP meaning.
- With optional exhaustification of CP meaning:
  - Strong reading of constituent question
  - Bipolar reading of polar question: $\langle ..., [C]_{...} \rangle + [\![\textit{Did Ed meet Beth (or not)?}]\!]^{S_1S_2}$ = $\langle ..., [C]_{...}, [\cup\{\{\sqrt{C}\} + S_2 \vdash p \mid p\in\{\varphi_b, \varphi_b\}\}]_{S_1} \rangle$



- Without exhaustification of CP meaning:
  - Weak reading of constituent question
  - Monopolar reading of polar question: $\langle ..., [C]_{...} \rangle + [\![\textit{Ed met Beth?}]\!]^{S_1S_2}$ = $\langle ..., [C]_{...}, [\cup\{\{\sqrt{C}\} + S_2 \vdash p \mid p\in\{\varphi_b\}\}]_{S_1} \rangle$



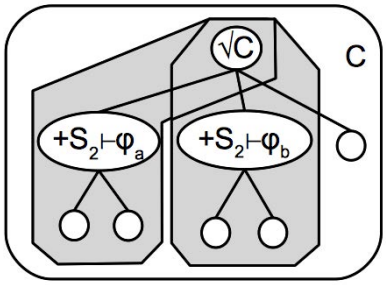
Questions

Syntactic realization in English

- Constituent questions
  - Movement of finite auxiliary verb to head of ActP
  - Movement of wh-constituent from SpecCP to SpecActP
  - $[_{ActP}$ *who* $[_{Act^o}$?-*did*$]$ $[_{CP}$ t_{who} $[_{TP}$ *Ed* t_{did} *meet* $t_{who}]]]$
- Polarity questions
  - Declarative questions, e.g. *Ed met Beth?*
    Rising prosody turns assertion by S_1 to projected assertion by S_2
  - Syntactic questions:
    Assume deletion of complementizer.
  - $[_{ActP}$ $[_{Act^o}$?-*did*$]$ $[_{CP}$ ~~*whether*~~ $[_{TP}$ *Ed met Beth*$]]]$

Questions

- Alternative questions
  - Disjunct phrase scopes over question act
  - [*Ann or Beth*$]$ $[_{ActP}$ $[_{Act^o}$?-*did*$]$ $[_{CP}$ ~~*whether*~~ $[_{TP}$ *Ed* t_{did} *meet* $t_{Ann\ or\ Beth}]]]$
  - Interpreted as disjunction of two monopolar questions



Questions

Derivation of question acts, second option

- Question acts are not derived directly from question CPs, but are derived independently, in parallel.
- Explains why polar question acts don't have complementizer *whether*
- Assume that question operator ? combines with TP (proposition), not a CP (set of propositions)
- Polar questions:
  - $[_{\text{ActP}}\ [_{\text{Act}^\circ}$?-*did*$]\ [_{\text{TP}}$ *Ed* t_{did} *meet Beth*$]]$
  - Generation of monopolar reading
    $\langle ..., [C]_{...} \rangle + [\![?]\!]^{S_1S_2}([\![[_{\text{TP}}$ *Ed met Beth*$]]\!]^{S_1S_2})$
    $= \langle ..., [C]_{...}, [\{\surd C\} \cup C{+}S_2 \vdash \varphi_b]_{S_1} \rangle$
  - Generation of bipolar reading with a variant ??:
    $\langle ..., [C]_{...} \rangle + [\![??]\!]^{S_1S_2}([\![[_{\text{TP}}$ *Ed did meet Beth*$]]\!]^{S_1S_2})$
    $= \langle ..., [C]_{...}, [\{\surd C\} \cup C{+}S_2 \vdash \varphi_b \cup C{+}S_2 \vdash \neg\varphi_b]_{S_1} \rangle$

Questions

Second option, continued

- Constituent questions as disjunctions of monopolar questions
  - *Who did Ed meet?*
    ≈ *Did Ed meet Ann, or did Ed meet Beth, or did Ed meet Carla?*
  - $[\![[_{\text{ActP}}$ *who* $[_{\text{Act}^\circ}$?-*did* $[_{\text{TP}}$ *Ed meet* $t_{\text{wh}}]]]]\!]^{S_1S_2}$
    $= \bigvee_{x \in \text{PERSON}} [\![[[_{\text{Act}^\circ}$?$]\ [_{\text{TP}}$ *Ed meet* $t_x]]]\!]^{S_1S_2}$
    $= \lambda\langle ..., [C]_{...} \rangle \langle ..., [C]_{...}, [\{\surd C\}{+}S_2 \vdash \varphi_a \cup \{\surd C\}{+}S_2 \vdash \varphi_b\} \cup \{\surd C\}{+}S_2 \vdash \varphi_c]_{S_1} \rangle$
  - Interrogative quantifiers as existential quantifiers over speech acts, corresponds to ambiguity of wh-words as interrogatives and indefinites observed in many languages
  - In embedded questions: existential quantifiers over question sets.
- In this second construction:
  - Question speech acts not derived from embedded question meanings,
  - but parallel development of embedded questions (set of propositions) and question acts (set of assertions).

Question Tags

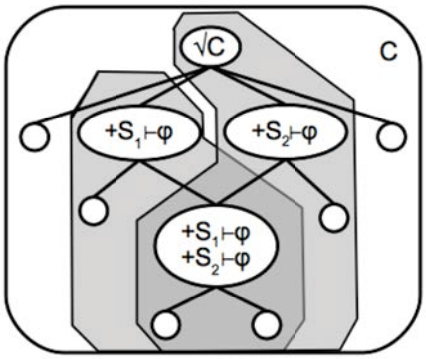
Two types of question tags

- Matching question tags:
  - S_1 to S_2: *Ed met Beth, did he?*
  - Cattell 1973: S_1 puts forward proposition φ_b as a potential assertion of S_2
  - S_1 suggests a *yes* answer, and guarantees commitment to the proposition in case S_2 commits to it.
  - Amounts to a question biased towards φ_b
- Reverse question tags:
  - S_1 to S_2: *Ed met Beth, didn't he?*
  - Cattell 1973: S_1 asserts proposition φ_b but leaves an option for S_2 to contradict.
  - Amounts to a weakened assertion of φ_b that asks for confirmation.
- Implementation as weakened assertions that

Question Tags

Matching question tags

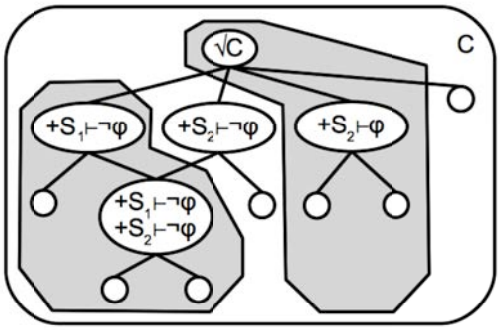
- S_1 to S_2: *Ed met Beth, did he?*
- Represented as a speech-act **conjunction** of the assertion *Ed met Beth* and the monopolar question spelled out as *Did Ed meet Beth?*
- Recall: Speech act conjunction is **intersection** of commitment spaces, $C + [\mathfrak{A} \,\&\, \mathfrak{B}] = [C + \mathfrak{A}] \cap [C + \mathfrak{B}]$
- Applied to example:
  $C + [\![\textit{Ed met Beth.}]\!]^{S_1S_2} \,\&\, [\![\textit{Did Ed meet Beth?}]\!]^{S_1S_2}]$
  $= [C + [\![\textit{Ed met Beth.}]\!]^{S_1S_2}] \cap [C + [\![\textit{Did Ed meet Beth?}]\!]^{S_1S_2}]$
- Suggested move: S_1 and S_2 are responsible for φ_b
- If S_2 does not react, this becomes established fact, i.e. S_2 is responsible even without explicit *yes*.
- Reaction *no*: Rejection of the last move, assertion $S_2 \vdash \neg\varphi_b$



Question Tags

Reverse question tags

- S_1 to S_2: *Ed didn't meet Beth, did he?*
- Represented as speech-act **disjunction** of assertion *Ed didn't meet Beth* and monopolar question *Did Ed meet Beth?*



- Recall: Speech act disjunction is **union** of commitment spaces,
  $C + [\mathfrak{A} \vee \mathfrak{B}] = [C + \mathfrak{A}] \cup [C + \mathfrak{B}]$
- Applied to example:
  $C + [\![\textit{Ed didn't meet Beth.}]\!]^{S_1S_2} \vee [\![\textit{Did Ed meet Beth?}]\!]]^{S_1S_2}$
  $= [C + [\![\textit{Ed didn't meet Beth.}]\!]^{S_1S_2}] \cup [C + [\![\textit{Did Ed meet Beth?}]\!]^{S_1S_2}]$
- If S_2 asserts $\neg\varphi_b$, e.g. by agreeing *No, he didn't*, assertion $S_1 \vdash \neg\varphi_b$ is guaranteed.
- Reaction *Yes, he did*: Assertion $S_2 \vdash \varphi_b$, no rejection required.

Question Tags

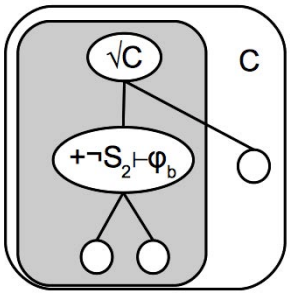
Reverse question tags, negated tag

- S_1 to S_2: *Ed met Beth, didn't he?*
- Spell-out of tag as *Did Ed not meet Beth?* Then derivation as before.
- Spell out of tag as *Didn't Ed meet Beth?* High negation in question.

Question Tags

What is high negation in questions?

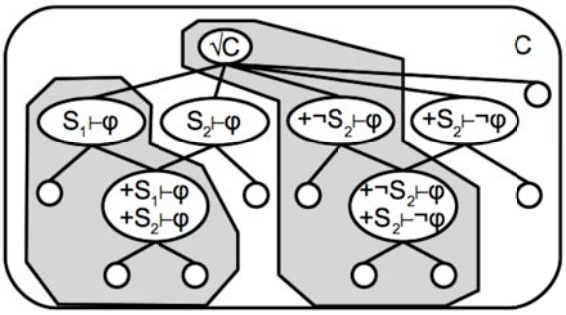
- Ladd 1982, Büring & Gunlogson 2000, Romero & Han 2004 …
  Krifka 2012: speech act denegation
- New proposal:
  - Adding information about **non-committa**l to a proposition to the set of commitment states:
    C +¬S⊢φ “S is not committed to φ”
  - Projective effect:
    Committal S⊢φ is excluded from further development.
- Example:
  - ⟨..., $C_{...}$⟩ + ⟦*Didn’t Ed meet Beth?*⟧^{S_1S_2}
    = ⟨..., $C_{...}$, [∪{{√C} + ¬S_2⊢φ_b}$_{S_1}$]⟩
- Suggestive for syntax: Recursive ActP.
  - [$_{ActP}$ [?-*did*] [$_{ActP}$ *not* [$_{ActP}$ [.] [$_{TP}$ *Ed* t_{did} *meet Beth*]]]]



Question Tags

Reverse question tags, continued

- S_1 to S_2: *Ed met Beth, didn’t he?*
- Represented as a speech-act **disjunction** of the assertion *Ed met Beth* and the **high negation** question *Didn’t Ed meet Beth?*
- Recall: Speech act disjunction is **union** of commitment spaces,
  C + [𝔄 ∨ 𝔅] = [C + 𝔄] ∩ [C + 𝔅]
- Applied to example:
  C + [⟦*Ed met Beth.*⟧^{S_1S_2} ∨ ⟦*Didn’t Ed meet Beth?*⟧]^{S_1S_2}
  = [C + ⟦*Ed met Beth.*⟧^{S_1S_2}] ∪ [C + ⟦*Didn’t Ed meet Beth?*⟧^{S_1S_2}]
- S_1 invites S_2 to one of the following moves:
  - to assert ¬φ_b by S_2⊢¬φ_b (in which case assertion S_1⊢¬φ_b is guaranteed)
  - to assert φ_b by S_s⊢φ_b (no retraction required).



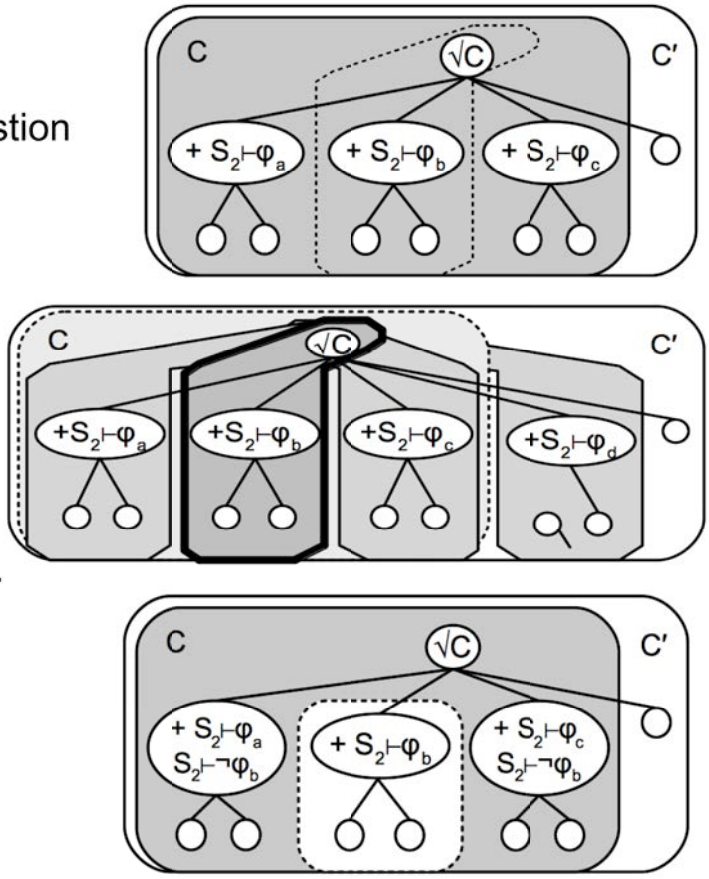
Focus in questions

Here: Focus in polarity questions

- Example:
  S_1: *Did Ed meet BETH$_F$?*
  S_2: *Yes.* / S_2: *No, he met ANN$_F$.* / S_2: # *No.*
- Explanation:
  - Focus, as always, indicates the presence of alternatives.
  - Focus on the monopolar question act *Did Ed meet BETH?* indicates alternative monopolar question acts, e.g. *Did Ed meet Ann?, Did Ed meet Carla?*
  - Focus indicates an input commitment state that is the disjunction of these alternatives.
  - This is essentially a commitment state after asking *Who did Ed meet?*
  - The answer *no* rejects the last projected move, the assertion of *Ed met Beth.*
  - This rejection leads back to the background question, *Who did Ed meet?*
  - This question is then answered.

Focus in questions

- Explanation in detail:
  - Commitment space after question *Who did Ed meet?* (accommodated)
  - Alternatives of monopolar question *Did Ed meet BETH$_F$?*
  - Observe: Union of alternatives include the input commitment space; satisfies congruence criterion.
  - S_2: *No.* Requires reject operation leading back to question,' adding $S_2 \vdash \neg\varphi_b$, remaining projected moves: answers to question.



Wrapping up...

- Developed:
  A formal model for speech acts, in particular assertions and questions.
- Distinctive features:
  - Speech acts change common ground
  - Common ground as a permanent record of commitments..
  - Common grounds have a projective component
    that determines its possible developments.
- Phenomena discussed:
  - Assertions as commitments to a proposition.
  - Questions as projected assertions by the addressee.
  - Monopolar questions, projecting just one assertion, expressing bias.
  - Alternative and constituent questions as question disjunctions.
  - High negation questions and projected refusals of assertions.
  - Question tags as {con/dis}junctions of assertions and questions
  - Focus in polarity questions as indicating underlying broader question.
- Division of labor?
  - Semantic operations can happen on the level of speech acts.
  - Syntactic operations can map ordinary semantics to speech acts.