Focus in Answers and Questions in Commitment Space Semantics

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Focus in answers to questions

Focus: Relate answers to their constituent questions

- Hermann Paul 1880, *Prinzipien der Sprachgeschichte*:
  "Am schärfsten von den übrigen Gliedern des Satzes sondert sich zunächst das psychologische Präd. ab als das wichtigste, dessen Mitteilung der Endzweck des Satzes ist, auf welches daher der stärkste Ton fällt."
- Question-Answer relation
  - *Where will Karl travel tomorrow?* — *Karl will travel to BERLIN tomorrow.*
  - *When will Karl travel to Berlin?* — *Karl will travel to Berlin TOMORROW.*
  - *Who will travel to Berlin tomorrow?* — *KARL will travel to Berlin tomorrow.*
- Hermann Paul 1919, *Deutsche Grammatik*
  - *Where will Fritz travel tomorrow?* — *Fritz will travel to POTSDAM tomorrow.*
- Focus projection (Selkirk 1984, Gussenhoven 1984, Jacobs 1991)
  F: focus feature (Jackendoff 1977)
  - *What will Karl do tomorrow?* — *Karl will* [*travel to BERLIN*]$_F$ *tomorrow*.
- Multiple focus
  - *When will Karl travel to where?*
    Karl will travel [to BERLIN]$_F$ [*TODAY*]$_F$
    and [*to POTSDAM*]$_F$ [*TOMORROW*]$_F$.

Focus and alternatives

Nature of focus:

- What is the „most important“ syntactic constituent, the „final purpose“ of a sentence?
- The one which is selected out of a set of alternatives (Jacobs 1983, Rooth 1985, v. Stechow 1990)
- Prototypical example: Answer to questions
  - Congruent question-answer pair:
    - *Who will travel to Berlin tomorrow?*
      [*KARL*]$_F$ *will travel to Berlin tomorrow.*
  - Alternatives:
    - ‘Karl will travel to Berlin tomorrow’
    - ’Fritz will travel to Berlin tomorrow’
    - ‘Sophie will travel to Berlin tomorrow’
    - *...*
- Other examples: Focus-sensitive particles, e.g. ‘only’:
    - *Only* |*KARL*] *will travel to Berlin tomorrow.*
    - For all x such that x will travel to Berlin tomorrow: *x* = Fritz

Rooth, Mats. 1985. Association with focus. University of Massachusetts at Amherst.
von Stechow, Arnim. 1990. Focusing and backgrounding operators. In: Abraham, Werner, (ed), Discourse particles. Amsterdam: John Benjamins, 37-84.
Jacobs, Joachim. 1983. Fokus und Skalen. Zur Syntax und Semantik der Gradpartikel im Deutschen. Tübingen: Niemeyer.

Focus in answers: Question meanings

Alternative notions of alternatives:

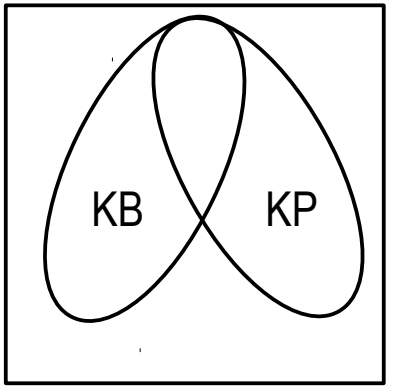
- Charles Hamblin, 1973
  - sets of propositions
  - where a proposition is a set of indices (world / times)
  - may overlap
  - not exhaustive

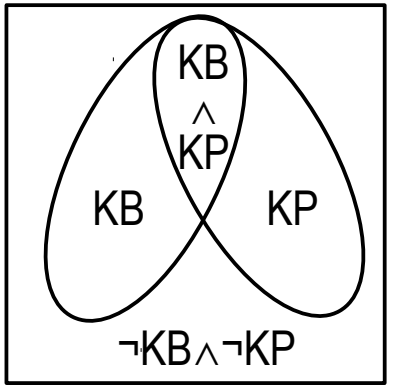
- Groenendijk & Stokhof 1984
  - Partitions of all indices
  - no overlap
  - exhaustive

- Inquisitive semantics (Ciardelli, Groenendijk, Roelofsen 2013)

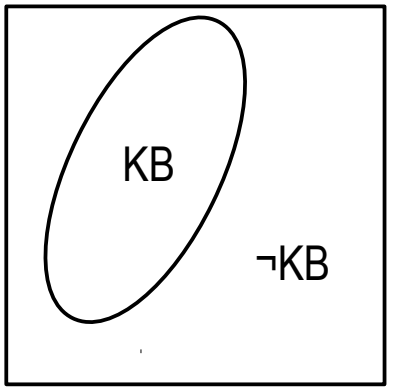
  Glossing over details:
  - Non-inquisitive meanings are singleton sets of propositions, ⟦*Karl will travel to Berlin or Potsdam*⟧ = {KB∨KP}
  - Inquisitive meanings are non-singleton set of propositions, ⟦*Where will Karl travel to, to Berlin or to Potsdam*⟧ = {KB, KP}

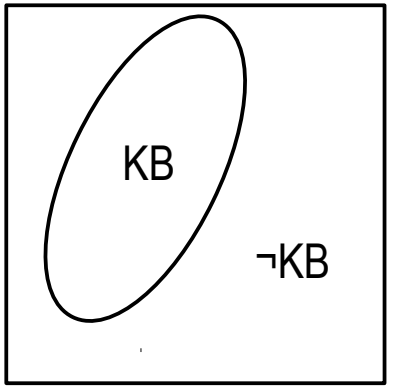
Where does Karl travel to, to Berlin or to Potsdam?





Does Karl travel to Berlin?



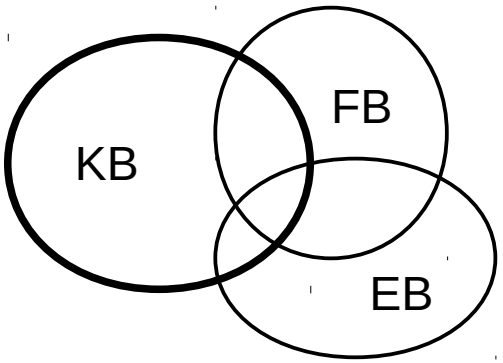


Focus in answers

Established theories for Q/A focus congruence

- Alternative semantics (Rooth 1985, 1992):
  - Distinguish between ordinary meanings and focus meanings:
    - ⟦*Karl will travel to* [*Berlin*]$_F$ ⟧ = KB
    - ⟦*Karl will travel to* [*Berlin*]$_F$⟧^{f} = {Kx | x∈Places}
  - Questions denote sets of propositions:
    - ⟦*Where will Karl travel to?*⟧ = {Kx | x∈Places}
  - The focus meanings have to correspond to the question meanings:
    - ⟦*Where will Karl travel to?*⟧ ⊆ ⟦*Karl will travel to* [*BERLIN*]$_F$⟧^{f}
  - Failure of Q/A congruence:
    - ⟦*Where will Karl travel to?*⟧ ⊈ ⟦[*KARL*]$_F$ *will travel to Berlin*⟧^{f}

⟦[*KARL*]$_F$ *will travel to Berlin*⟧^{f}



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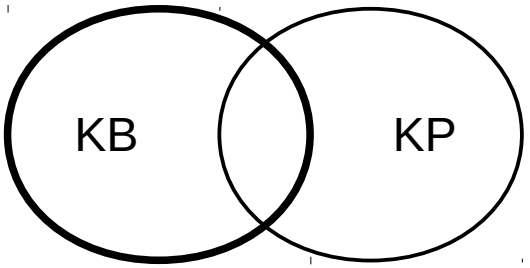
⟦*Where will Karl travel to , Berlin or Potsdam?*⟧



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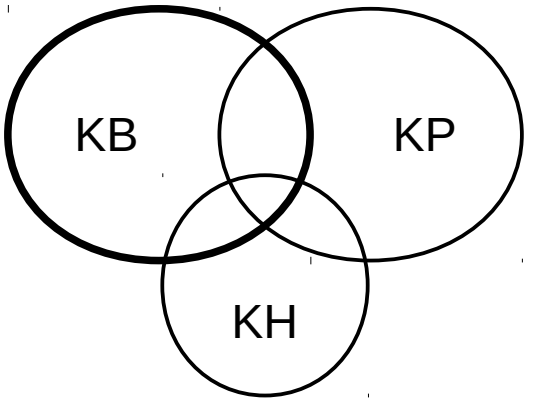
⟦*Karl will travel to* [*BERLIN*]⟧^{f}



Focus in Answers

- Structured meanings
  (Jacobs 1983, 1984, von Stechow 1990, Krifka 1992):
  - Focus induces structuring into background part and focus part
    - ⟦*Karl will travel to* [*BERLIN*]$_F$⟧ = ⟨λx[Karl will travel to x], Berlin⟩
    - ⟦[*KARL*]$_F$ *will travel to Berlin*⟧ = ⟨λx[x will travel to Berlin], Karl⟩
  - Questions introduce structuring into background part and wh-part:
    - ⟦*Where will Karl travel to?*⟧ = ⟨λx[Karl will travel to x], {x|x is a place}⟩
    - ⟦*Who will travel to Berlin*⟧ = ⟨λx[x will travel to Berlin], {x|x is a person}⟩
  - In congruent Q-A-relations,
    - background of Q and A must be the identical (in the most congruent case),
    - Focus of answer must be an element of wh-part of question

Jacobs, Joachim. 1984. Funktionale Satzperspektive und Illokutionssemantik. Linguistische Berichte 91: 25-58.
Krifka, Manfred. 1992. A compositional semantics for multiple focus constructions. In: Jacobs, Joachim, (ed), Informationsstruktur und Grammatik. Opladen: Westdeutscher Verlag, 17-53.

Focus in questions

But what about focus in questions?

- Focus in polarity question (H* accent)::
  - *Will KARL$_F$ travel to Berlin?*
  - *Yes. / #No. / No, FRITZ. / No, FRITZ will travel to Berlin.*
- *li*-marked questions in Russian:
  - *Karl li pojedet v Berline?*
- Focus in constituent questions (L*H accent, contrastive topic)
  - *I know who will travel to Potsdam tomorrow.*
    But who will travel to BERLIN tomorrow?

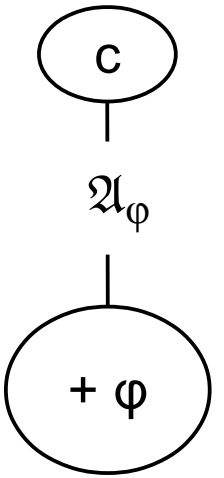
    KARL will travel to Berlin tomorrow.
- Goal of this talk:
  - Present a framework for focus across speech acts (assertions and questions)
  - Cast in Commitment Space Semantics (cf. Cohen & Krifka 2014, Krifka 2015).

Cohen, Ariel & Manfred Krifka. 2014. Superlative quantifiers and meta-speech acts. Linguistics and Philosophy 37: 41-90.
Krifka, Manfred. 2015. Bias in Commitment Space Semantics: Declarative questions, negated questions, and question tags. SALT. 25. 328-345.

Commitment States

Basic assumptions:

- Illocutionary acts change commitments of interlocutors
- A commitment is represented by a proposition, e.g. φ
- Commitments accrue during conversation, modeled by a commitment state, a set of propositions
- Cf. common ground in dynamic semantics: Stalnaker, Lewis, Karttunen, Heim, often modeled as context set (a proposition)



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

- $c + \mathfrak{A}_\varphi = c \cup \{\varphi\}$, where φ: commitment introduced by speech act $\mathfrak{A}_\varphi$

Requirements for update of commitment states:

- φ should not be present in c: $\varphi \notin c$
- φ should be consistent with c: $c \cup \{\varphi\} \not\models \bot$
- φ may make overt a proposition already entailed by c (analytic update): $c \models \varphi$, $c \cup \{\varphi\}$

A Framework for Illocutionary Acts:

Commitment Spaces

Basic idea:

- Commitment states represent the propositions the interlocutors have agreed upon at the current state of conversation
- Commitment spaces (CS) represent the preferred future developments
- Cf. distinction common ground content vs. common ground management (Krifka 2008)

Why commitment spaces?

- Denegations: S refrains from speech act (Searle 1969, Hare 1970): *I don't promise to come.*
- Questions: S restricts future developments to answers

Modeling of commitment spaces

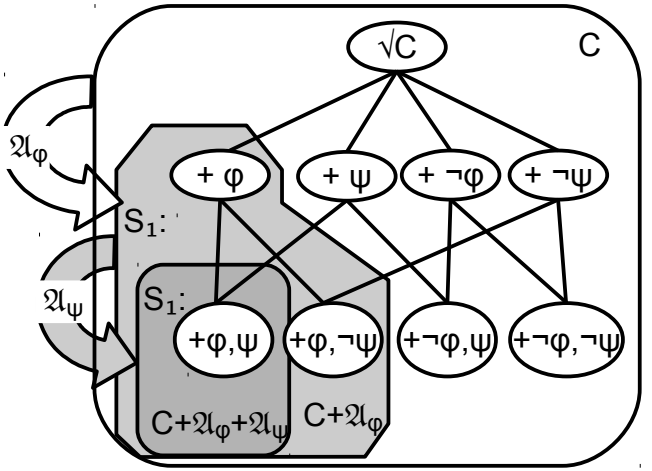
- As sets of commitment states
- where the commitment states are ordered by $\subseteq$
- smallest commitment state is the root of the CS

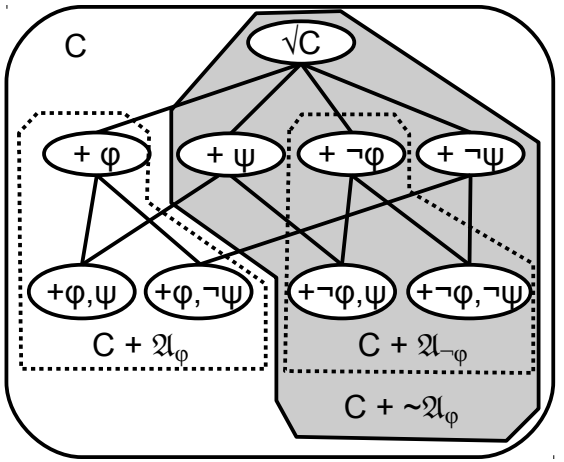
Update of commitment space C with speech act $\mathfrak{A}$:

- $C + \mathfrak{A} = \{c \in C \mid \surd C + \mathfrak{A} \subseteq c\}$
- Indicating actor / performer S: $C + \mathfrak{A} = \langle C + \mathfrak{A}, S \rangle$

Update with denegation of speech act $\mathfrak{A}$:

- $C + {\sim}\mathfrak{A} = C - [C + \mathfrak{A}]$
- This does not change the root – a meta speech act (Cohen & Krifka 2014)



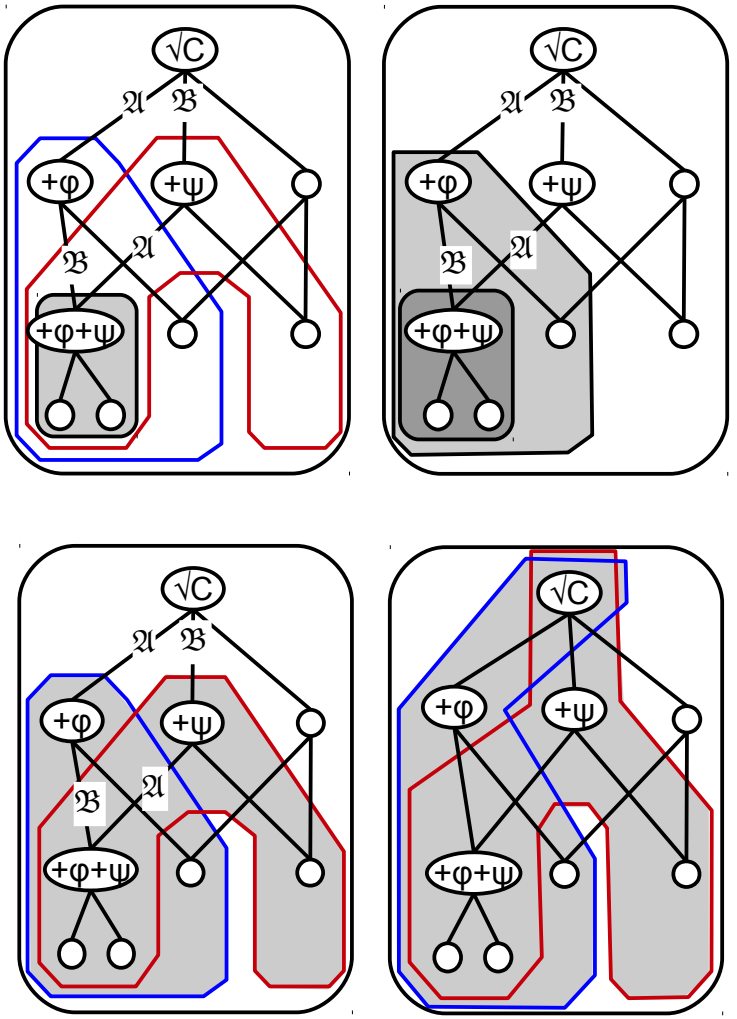


Searle, John R. 1969. Speech acts. An essay in the philosophy of language. Cambridge: Cambridge University Press.
Hare, R. M. 1970. Meaning and speech acts. The Philosophical Review 79: 3-24.

Conjunction and disjunction of CSs

- Conjunction of speech acts by intersection
  - C + [𝔄 & 𝔅] = [[C + 𝔄] ∩ [C + 𝔅]]
  - If C has a single root, C + [𝔄 & 𝔅] has, too
  - Similar to sequential update (dynamic conjunction), except for anaphoric bindings

    C + [𝔄 ; 𝔅] = [C + 𝔄] + 𝔅
- Disjunction of speech acts by union
  - C + [𝔄 V 𝔅] = [[C + 𝔄] ∪ [C + 𝔅]]
  - Single root is not guaranteed!
- Multiple-rooted commitment spaces and their updates
  - C: a set of commitment states
  - √C ⊆ C: the set of minimal commitment states in C
  - C + 𝔄 = {c∈C | ∃c′∈√C [c′ + A ⊆ c]}
- Preference for single-rooted commitment spaces
  - Unclear commitments after disjunction (cf. Gärtner & Michaelis 2010)
  - Objectionable status of speech act disjunction (Krifka 2001)
  - But with meta speech acts, single root IS guaranteed



Gärtner, Hans-Martin & Jens Michaelis. 2010. On Modeling the Distribution of Declarative V2-Clauses: the Case of Disjunction. In: Bab, Sebastian & Klaus Robering, (eds), Judgements and Propositions. Logical, Linguistic, and Cognitive Issues. Berlin: Logos, 11-25.

Krifka, Manfred. 2001. Quantifying into question acts. Natural Language Semantics 9: 1-40.

Assertion

The essence of assertion

- Speaker commits to the truth of a proposition:
  $S_1 \vdash \varphi$ 'S_1 is committed to the truth of φ', where $\vdash$: Frege's judgement stroke
- Typical motive to assert: S_1 wants to make φ common ground
- But this is only a conversational implicature, as it can be cancelled:
  - *Believe it or not, Karl will go to Berlin.*
  - *I know you won't believe me, but just for the record: Karl will go to Berlin.*
- Reason for addressee to draw this implicature:
  Social sanctions for committing to falsehoods
- Cf. Charles S. Peirce, ca. 1908 (cf. Tuzet 2006)
  - 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.
- Cf. Brandom 1983, McFarlane 2011, etc.

Tuzet, Giovanni. 2006. Responsible for Truth? Peirce on judgement and assertion. Cognitio 7: 317-336.
Brandom, Robert B. 1983. Asserting. Noûs 17: 637-650.
MacFarlane, John. 2011. What is assertion? In: Brown, Jessica & Herman Cappelen, (eds), Assertion. New philosophical essays. Oxford: Oxford University Press

Assertion

Implementation of assertion:

- S: C + ASSERT(φ) = C + S⊢φ, where S: speaker, S⊢φ: S is publicly committed to φ

Syntactic structure of assertive sentences

- Asserted proposition: TP, Tense Phrase
- Proposition expressing commitment: CmP, Commitment Phrase
- Application to Commitment Space: ActP, Illocutionary Act Phrase
- Following principles of $\overline{X}$-syntax:
  - $[_{ActP}\ [[_{Act^o}\ \bullet\ ]\ [_{CmP}\ [[_{Cm^o}\ \vdash\ ]\ [_{TP}$ *I have won the race*]]]]]
  - $[_{ActP}\ I_1\ [[_{Act^o}$ *have* $\bullet\ ]\ [_{CmP}\ t_I\ [[_{Cm^o}\ t_{have}\ \vdash\ ]\ [_{TP}\ t_I\ \ t_{have}$ *won the race*]]]]]
- cf. Speas 2004: ActP ≈ Speech Act Phrase, CmP ≈ Evaluative Phrase
- verb movement as related to speech act: Cf. Truckenbrodt 2006

Semantic interpretation:

- $[\![[_{ActP}\ [[_{Act^o}\ \bullet\ ]\ [_{CmP}\ [[_{Cm^o}\ \vdash\ ]\ [_{TP}$ *I won the race*]]]]]$]\!]^{S_1S_2}$ S_1: speaker
  $= [\![[_{Act^o}\ \bullet\ ]]\!]^{S_1S_2}([\![[[_{Cm^o}\ \vdash]\ [_{TP}$ *I won the race*]]$]\!]^{S_1S_2})$ S_2: addressee
  $= [\![[_{Act^o}\ \bullet\ ]]\!]^{S_1S_2}([\![[_{Cm^o}\ \vdash]]\!]^{S_1S_2}([\![[_{TP}$ *I won the race*]$]\!]^{S_1S_2}))$
- with $[\![[_{TP}$ *I won the race*]$]\!]^{S_1S_2}$ = ‘S_1 won the race’ proposition, TP
  $[\![[_{Cm^o}\ \vdash]]\!]^{S_1S_2} = \lambda p \lambda S[S \vdash p]$ head of CmP
  $[\![[_{Act^o}\ \bullet\ ]]\!]^{S_1S_2} = \lambda R \lambda C \langle [C + R(S_1)], S_1 \rangle$ head of ActP
- $= \lambda C \langle [C + S_1 \vdash$ ‘S_1 won the race’], $S_1 \rangle$

Speas, Margaret. 2004. Evidentiality, logophoricity and the syntactic representation of pragmatic features. Lingua 114.

Truckenbrodt, Hubert. 2006. On the semantic motivation of syntactic verb movement to C in German. Theoretical Linguistics 32: 257-306.

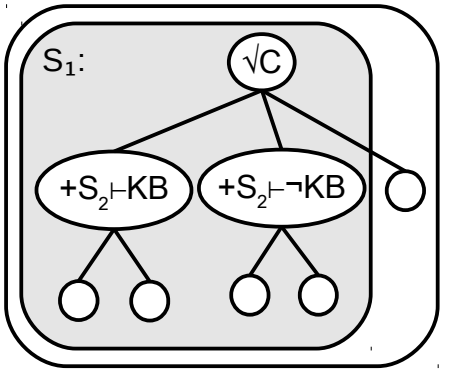
Questions as meta speech acts

Questions affect the future development of conversation:

- Preferred development: Addressee answers question

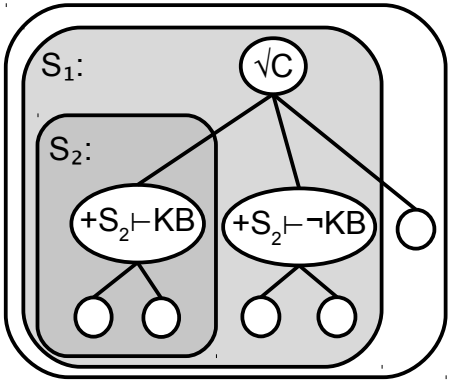
Example, disjunctive polarity question:

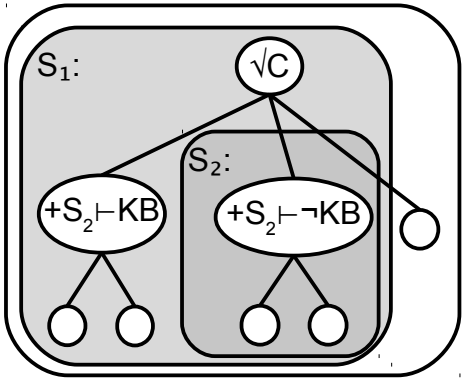
- C + S_1 to S_2: *Will Karl travel to Berlin or not?*
- = $\langle \surd C \cup [C + S_2 \vdash KB] \cup [C + S_2 \vdash \neg KB], S_1 \rangle$



Prefered reaction by S_2: Assertion

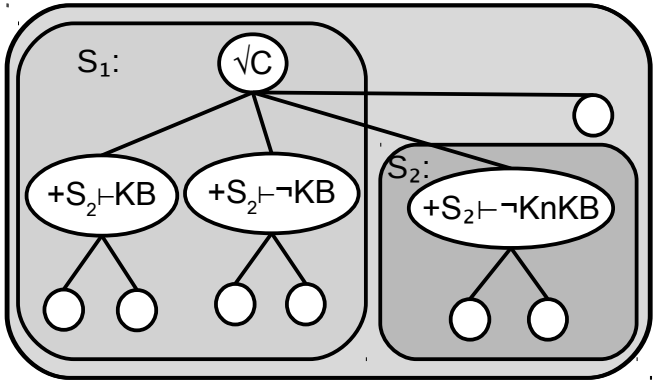
- *Yes, Karl will travel to Berlin.*
- *No, Karl will not travel to Berlin.*





Non-congruent answers:

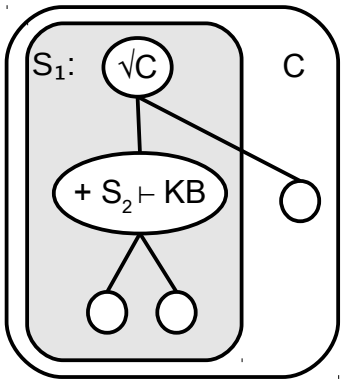
- *I don't know..*
  I can't tell you.
- Requires previous rejection of question, as $S_2 \vdash \varphi$ / $S_2 \vdash \neg\varphi$ and $S_2 \vdash \neg K n \varphi$ are pragmatically non-consistent
- Cf. Krifka 2015 for reject operation
- Alternative treatment: table, Farkas & Bruce 2010



Monopolar questions

Varieties of polar (yes/no) questions

- Bipolar questions, offer two equally prominent answers (yes / no)
  - The dominant polar question type considered in previous semantic models (Hamblin, Groenendijk/Stokhof, Inquisitive Semantics)
- Monopolar questions, offer only one prominent answer
  - Sometimes suggested (Roberts 1996, Gunlogson 2003, Biezma & Rawlins 2012)
  - Declarative questions, prosody: *Karl will travel to Berlin?*
  - Negated questions: *Will Karl not travel to Berlin?*
  - One option for regular questions: *Will Karl travel to Berlin?*



Modeling of monopolar questions in Commitment Space Semantics

- $[\![[_{ActP} [[_{Act^o}$ *Did ?* $] [_{CmP}$ *I* $[[_{Cm^o} \vdash] [_{TP} t_I t_{did}$ *win the race* $] [_{T^o} \_]]]]]]\!]^{S_1S_2}$
  $= [\![[_{Act^o} ?]]\!]^{S_1S_2}([\![[_{Cm^o} \vdash]\!]^{S_1S_2}([\![[_{TP}$ *I did win the race*$]]\!]^{S_1S_2}))$
- With $[\![[_{Act^o} ?]]\!]^{S_1S_2} = \lambda R \lambda C \langle [\sqrt{C} \cup C + R(S_2)], S_1 \rangle$ head of question act phrase
  $[\![[_{Cm^o} \vdash]]\!]^{S_1S_2} = \lambda p \lambda S[S \vdash p]$ head of CmP, as before
  $[\![[_{TP}$ *I did win the race*$]]\!]^{S_1S_2}$ = 'S_1 has won the race' TP, as before
  $= \lambda C \langle [\{\sqrt{C}\} + S_2 \vdash$ 'S_1 won the race'$], S_1 \rangle$

Difference between assertions and questions:

- Both assertions and questions have a CmP projection with head $\vdash$ expressing public commitment for the truth of a proposition.
- Assertion has Act head • : Speaker expresses commitment
- Question has Act head ? : Speaker requests commitment from addressee
- Commands, Promises, Expressives etc. are not based on $\vdash$ head.

CmP in egophoric systems

Egophoricity (conjunct/disjunct systems)

- Example: Kathmandu Newari (Hargreaves 2005):

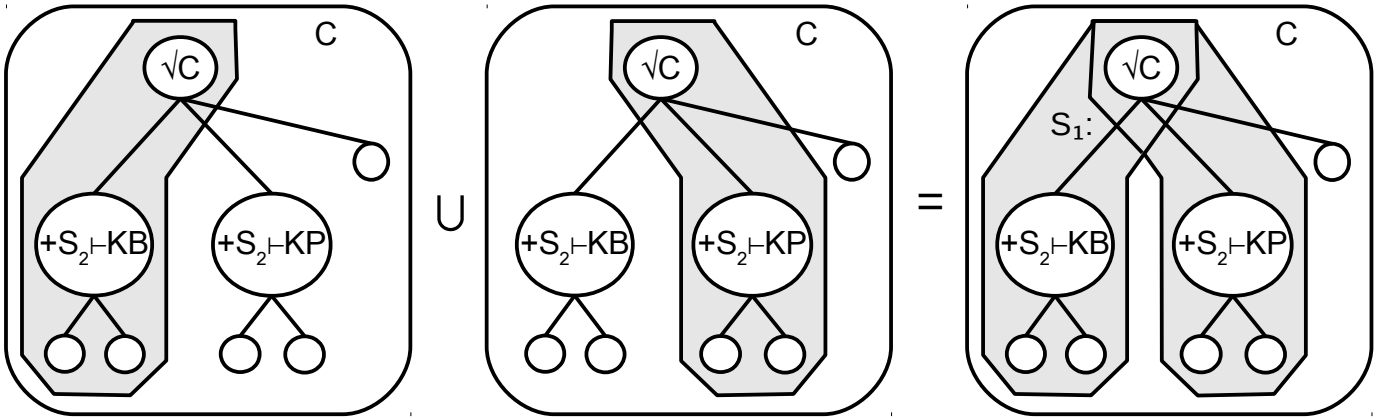
Assertions	Questions
a. *jī:* *a:pwa twan–**ā**.* 1.SG.ERG much drink-PST.**CJ** 'I drank a lot.'	d. *jī:* *a:pwa twan–**a**-la.* '1.SG.ERG much drink-PST.**DJ**-Q 'Did I drink a lot?'
b. *chā* *a:pwa twan–**a**.* 2. SG.ERG much drink-PST.**DJ** 'You drank a lot'	e. *chā* *a:pwa twan–**ā**-la.* 2.SG.ERG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

- Proposal:
  - CJ presupposes Committer = Subject:
    $[\![CJ]\!]^{S_1S_2} = \lambda P \lambda x \lambda S.S{=}x[S \vdash P(x)]$
  - DJ presupposes Committer ≠ Subject:
    $[\![DJ]\!]^{S_1S_2} = \lambda P \lambda x \lambda S.S{\neq}x[S \vdash P(x)]$

Hargreaves, David. 2005. Agency and intentional action in Kathmandu Newari. Himalayan Linguistics 5: 1-48.

Disjunctive (or: Alternative) Questions

- Example of disjunctive (alternative) question
  - *Will Karl travel to /BERLIN or will Karl travel to \POTSDAM?*
  - *Will Karl travel to /BERLIN or to \POTSDAM?*
- Derivation as speech act disjunction (cf. Uegaki 2014, Japanese)
  - $[\![[_{ActP}\ ?\ \textit{Karl will travel to Berlin}]]\!]^{S_1S_2} = \lambda C\langle[\sqrt{C} \cup C + S_2 \vdash KB], S_1\rangle$
  - $[\![[_{ActP}\ ?\ \textit{Karl will travel to Potsdam}]]\!]^{S_1S_2} = \lambda C\langle[\sqrt{C} \cup C + S_2 \vdash KP], S_1\rangle$
  - $[\![[_{ActP}\ [_{ActP}\ ?\ \textit{Karl will travel to Berlin}]\ \textit{or}\ [_{ActP}\ ?\ \textit{Karl will travel to Potsdam}]]]\!]^{S_1S_2}$
    $= [\![[_{ActP}\ ?\ \textit{Karl will travel to Berlin}]]\!]^{S_1S_2} \vee [\![[_{ActP}\ ?\ \textit{Karl will travel to Potsdam}]]\!]^{S_1S_2}$
    $= \lambda C\langle[\sqrt{C} \cup C + S_2 \vdash KB] \cup [\sqrt{C} \cup C + S_2 \vdash KP], S_1\rangle$
    $= \lambda C\langle[\sqrt{C} \cup C + S_2 \vdash KB \cup C + S_2 \vdash KP], S_1\rangle$



Uegaki, Wataru. 2014. Japanese alternative questions as disjunctions of polar questions. SALT. 24. 42-62.

Why monopolar questions?

- Pragmatic strengthening of answers
  - If a question CS with more than one continuations is answered, assume that the answer is exhaustive.
  - If [$\sqrt{C} \cup C + S_2 \vdash KB \cup C + S_2 \vdash KP$] is answered by $S_2 \vdash KB$, assume that S_2 is not in a position to perform $S_2 \vdash KP$, under complete knowledge of S_2: assume $\neg KP$ as conversational implicature
- Monopolar questions as basic
  - One reason: Derivation of disjunctive questions is problematic if underlying questions are assumed to be bipolar
  - Derivation from bipolar question:
    $[\![$*Will Karl travel to Berlin or will Karl travel to Potsdam*$]\!]^{S_1S_2}$
    $= [\![$*will Karl travel to Berlin*$]\!]^{S_1S_2} \vee [\![$*will Karl travel to Potsdam*$]\!]^{S_1S_2}$
    $= \lambda C\langle[\sqrt{C} \cup S_2 \vdash KB \cup S_2 \vdash \neg KB], S_1\rangle \vee \lambda C\langle[\sqrt{C} \cup S_2 \vdash KBP \cup S_2 \vdash \neg KBP, S_1\rangle$
    $= \lambda C\langle[\sqrt{C} \cup S_2 \vdash KB \cup S_2 \vdash \neg KB \cup S_2 \vdash KP \cup S_2 \vdash \neg KP], S_1\rangle$
  - Wrongly suggests that *Karl did not travel to Berlin* is a congruent answer
  - Wrongly suggests that the answer *Karl traveled to Berlin* leaves open whether Karl traveled to Potsdam or not

Phrasal disjunctions in questions

- Question disjunction may be expressed over constituents:
  - *Will Karl travel* [*to /BERLIN or to \POTSDAM*]*?*
  - *Will Karl travel to* [*/BERLIN or \POTSDAM*]*?*
- Speech act disjunction V can be lifted, e.g. to DP level
  - $[\![[_{ActP}\ [_{DP}\ \textit{Berlin or Potsdam}]\ {}_x[_{ActP}\ ?\ \textit{will Karl travel to}\ t_x]]]\!]^{S_1S_2}$
  - $= [\![\textit{Berlin or Potsdam}]\!]^{S_1S_2}(\lambda x[[\![[_{ActP}\ ?\ \textit{will Karl travel to}\ t_x]]\!]^{S_1S_2})$
  - with $[\![\textit{Berlin or Potsdam}]\!]^{S_1S_2} = \lambda R \lambda C \langle R(B)(C) \cup R(P)(C), S_1\rangle$

    $[\![\ {}_x[_{ActP}\ ?\ \textit{will Karl travel to}\ t_x]]\!]^{S_1S_2} = \lambda x\ \lambda C[\sqrt{C} \cup C + S_2 \vdash Kx]$
  - $= \lambda C\langle[\sqrt{C} \cup C + S_2 \vdash KB \ \cup C + S_2 \vdash KP\ ], S_1\rangle$
- To be distinguished from propositional disjunction:
  - *Will Karl travel to /Berlin or /Potsdam?*
  - $[\![[_{ActP}\ ?\ [_{CmP} \vdash [_{TP}\ [_{DP}\ \textit{Berlin or Potsdam}]\ {}_x[_{TP}\ \textit{Karl will travel to}\ t_x]]]]]\!]^{S_1S_2}$
    $= \lambda C \langle[\sqrt{C} \cup C + S_2 \vdash [KB \ \vee KP], S_1\rangle$
- Non-falling final accent may also indicate non-closed list,
  where closed list presupposes that one of the assertions can be made.
  - *Will Karl travel to /Berlin, or will he travel to /Potsdam (…) ?*

Constituent Questions

Constituent questions as disjunctive questions

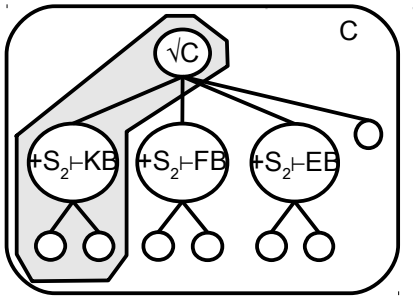
- $[_{ActP}$ *who*$_x$ $[[_{ActP}$ *will* ? $]$ $[_{CmP}$ t_x $[[_{Cm^o}$ $\vdash]$ $[_{TP}$ t_x t_{will} *travel to Berlin*$]]]]]$

Interpretation of wh constituent as generalized disjunction:

- $[\![[_{DP}$ *who*$]]\!]^{S_1S_2}$ = $\lambda R \lambda C \langle \bigvee_{x \in [\![person]\!]} R(x)(C), S_1 \rangle$
- $[\![{}_x[[_{Act^o}$?$]$ x *will travel to Berlin*$]]]\!]^{S_1,S_2}$
  $= \lambda x \lambda C[\sqrt{C} \cup S_2 \vdash xB]$
- $[\![[_{DP}$ *who*$]]\!]^{S_1S_2}([\![{}_x[[_{Act^o}$?$]$ x *will travel to Berlin*$]]]\!]^{S_1,S_2})$
  $= \lambda C \langle \bigvee_{x \in [\![person]\!]} [\sqrt{C} \cup S_2 \vdash xB] , S_1 \rangle$

wh constituent as indefinite (*who* ≈ *someone*)

- *Es fährt wer nach Berlin*
  'someone will go to Berlin'
- $[\![wer]\!] = \lambda r \bigvee_{x \in [\![person]\!]} r(x)$
- $[\![[_{TP}$ t_x nach B. fährt$]]\!]$ = $\lambda x[xB]$
- $[\![[_{TP}$ *wer fährt nach B.*$]]\!]$ = $\bigvee_{x \in [\![person]\!]} xB$



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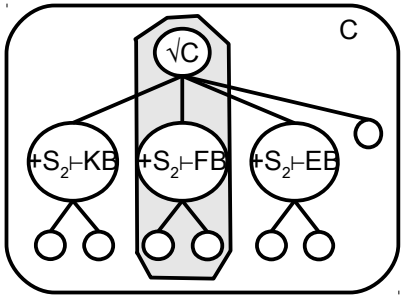

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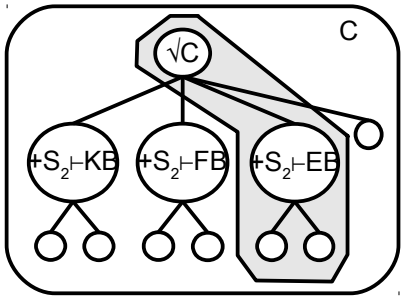

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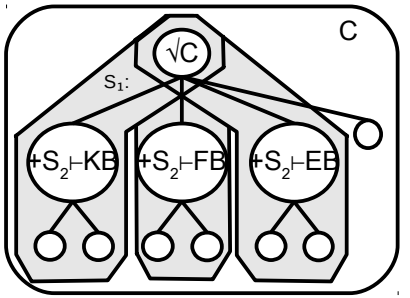


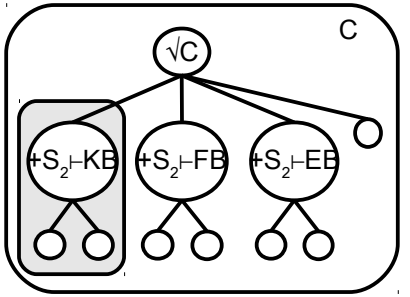
Bhat, D. N. S. 2000. The indefinite-interrogative puzzle. Linguistic Typology 4: 365-400.

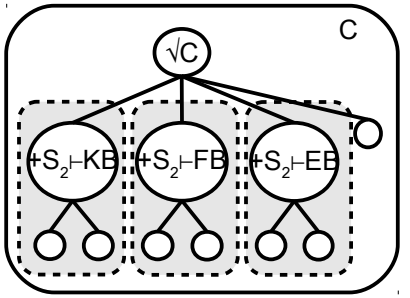
Embedded questions

- Two kinds of embedded questions:
  - *Mary knows if/whether Karl will travel to Berlin / who will travel to Berlin*
    embedded CP based on propositions
  - *Mary asked / wonders if/whether Karl will travel to Berlin / who will travel to Berlin*
    possibly embedded ActP – discourse particles, root clause syntax:
    Karl wondered will he travel to Berlin (McCloskey 2005, Irish English)
- Embedded CP, cf. Karttunen 1977:
  - $[\![[_{CP}\ [[_{C^o}\ \textit{if}]\ [_{TP}\ \textit{Karl will travel to Berlin}]]]]\!] = \lambda p[p=KB]$
  - $[\![[_{CP}\ \textit{whether}\ [[_{C^o}\ ]\ [_{TP}\ \textit{Karl will travel to Berlin}]]]]\!] = \lambda p[p=KB \vee p=\neg KB]$
  - $[\![[_{CP}\ \textit{who}\ _x[[_{C^o}\ ]\ [_{TP}\ t_x\ \textit{will travel to Berlin}]]]]\!] = \lambda p\ V_{x\in Person}[p=xB]$
  - know(i)(Q)(x) iff $\forall p[Q(p) \wedge p(i) \rightarrow$ know(i)(p)(x)] (exhaustive reading),
    i.e. *know if/whether/who* can be reduced to *know that*
- Embedded ActP, cf. Krifka 2001, 2014
  - wonder(i)($\mathfrak{Q}$)(x) iff x is interested in the answers of $\mathfrak{Q}$ at i,
    cognitive attitude can be characterized by the question
- CP, ActP derived by similar operations
  - *wh* as operators in SpecCP (proposition disjunction)
  - *wh* as operators in ActP (speech act disjunction)

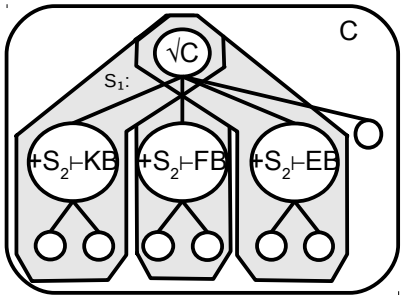
Focus in Answers

- Example exchange:
  - S_1: *Who will travel to Berlin?*
  - S_2: *KARL$_F$ will travel to Berlin.*
- Focus indicates alternative assertions:
  - regular meaning:
    $[\![[_{ActP} \cdot [_{CmP} \vdash [_{TP}$ *KARL$_F$ will travel to Berlin*$]]]]\!]^{S_2S_1}$
    $= \lambda C\langle[C{+}S_2\vdash KB], S_2\rangle$
  - focus meaning:
    $[\![[_{ActP} \cdot [_{CmP} \vdash [_{TP}$ *KARL$_F$ will travel to Berlin*$]]]]\!]^{f,S_2S_1}$
    $= \{\lambda C\langle[C{+}S_2\vdash KB], S_2\rangle \mid x\in ENTITY\}$





- Alternatives must correspond to question (modeled similar to Rooth 1992):
  - $[\![Q]\!]$ -- $[\![A]\!]$ is well-formed in C iff $[\![Q]\!](C) \subseteq \sqrt{C} \cup \bigcup [\![A]\!](C)$
  - i.e. $\bigcup_{x\in[\![person]\!]} [\sqrt{C} \cup S_2\vdash xB] \subseteq [\sqrt{C} \cup \bigcup\{[C{+}S_2\vdash xB], \mid x\in ENTITY\}$



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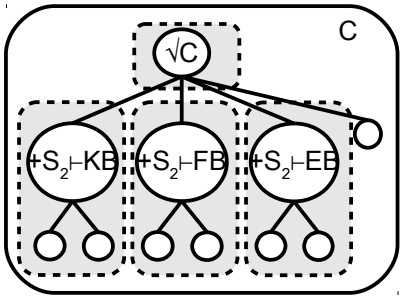


Focus in Assertions

A slightly different take on focus in assertion:

- Focus indicates alternatives.
- Focus interpreted at the level of speech acts indicates a Commitment Space that consists of a rooted disjunction of all the alternatives.
- An appropriate question provides such a Commitment Space, otherwise a suitable CS is accommodated.

Implementation:

- $C + [\![[_{ActP}\ [KARL]_F\ \textit{will travel to Berlin}]]\!]$

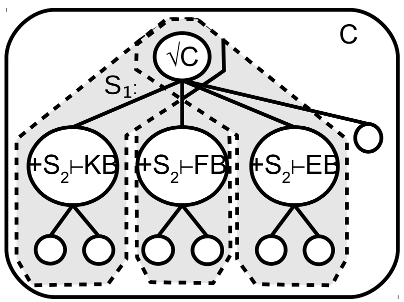
  $= [\surd C \cup C + \bigvee [\![[_{ActP}\ [KARL]_F\ \textit{will travel to Berlin}]]\!]^{f,S_1S_2}\ ]$ presupposed / accommodated

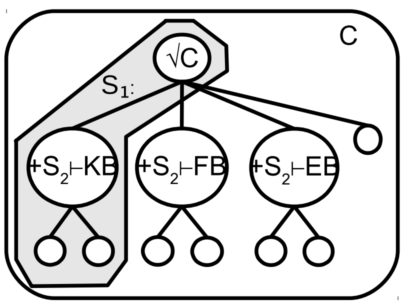
  $+ [\![[_{ActP}\ [KARL]_F\ \textit{will travel to Berlin}]]\!]^{S_1S_2}$ asserted

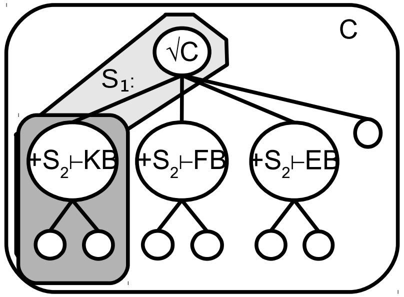
Focus in monopolar questions

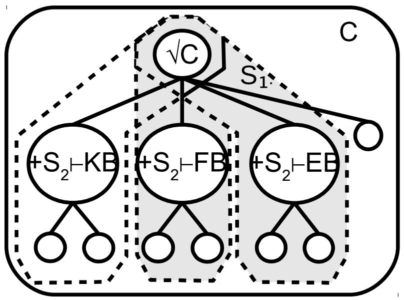
- Example exchange
  - S_1: *Will KARL$_F$ travel to Berlin?*
  - S_2: *Yes.*

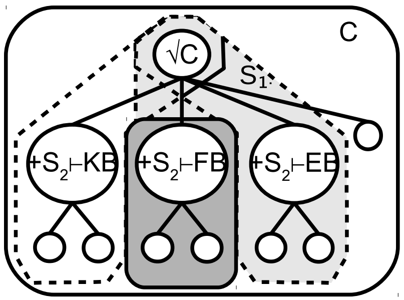
    S_2: *#No. / No, FRITZ will travel to Berlin.*
- Assume: Focus indicates alternative questions.
  - Regular meaning:
    $[\![[_{ActP}\ ?\ [_{CmP} \vdash [_{TP}\ \textit{KARL}_F\ \textit{will travel to Berlin}]]]]\!]^{S_2 S_1}$
    $= \lambda C \langle [\sqrt{C} \cup C{+}S_2{\vdash}KB],\ S_1] \rangle$
  - Focus meaning:
    $[\![[_{ActP}\ ?\ [_{CmP} \vdash [_{TP}\ \textit{KARL}_F\ \textit{will travel to Berlin}]]]]\!]^{f, S_2 S_1}$
    $= \{ \lambda C \langle [\sqrt{C} \cup [C + S_2{\vdash}xB],\ S_1 \rangle \mid x \in \text{ENTITY} \}$
- Focus meaning similar to constituent question meaning:
  - *Who will travel to Berlin?*
- Role of focus in monopolar questions:
  - Presuppose / accommodate a CS
    by way of disjunction
    over focus alternatives, similar to answers
  - In case of positive answer: proceed as usual.
  - In case of negative answer:
    fall back to constituent question meaning,
    answer the remaining constituent question
- Crucial for this analysis: monopolar analysis of questions proposed here.











Verum focus and bipolar questions

- Polarity phrase (NegP?): A projection for verum focus
  - S_1: *I don't believe that Karl will travel to Berlin.*
    S_2: *Karl WILL travel to Berlin.*
  - $[_{ActP} \ldots [_{CmP} \ldots [_{PolP}$ *Karl* $[_{Pol^o}$ pol *will* $]$ $[_{TP}$ t_{Karl} t_{will} *travel to Berlin*$]]]$
- Interpretation of verum focus:
  - Focus alternatives of pol: {λp[p], λp[¬p]}
  - Focus meaning: {λC[C+S_2⊢KB], λC[C+S_2⊢¬KB},
    presupposing background question λC[√C ∪ C+S_2⊢KB ∪ C+S_2⊢¬KB]
- Bipolar interpretation of polarity questions by focus on PolP:
  - S_1, to S_2: *WILL Karl travel to Berlin?*
  - Question meaning: λC[√C + S_2⊢KB] (actor: S_1)
    Question alternatives: {λC[√C + S_2⊢KB], λC[√C + S_2⊢¬KB]}
  - Question meaning is still monopolar,
    but question alternatives signal an underlying question that is interested in either answer.
- Another way to derive a bipolar interpretation: Disjunctive PolP
  - Assume pol can house a disjunction, λRλC ⟨R(λp[p])(C) ∪ R(λp[¬p])(C), S_1⟩
  - Quantifies into monopolar question, just as wh-phrase

Contribution of Focus in Speech Acts

Different uses of focus

- Focus always indicates alternatives,
  can be mediated by way of Alternative Semantics, Structured Meanings,
  or a hybrid mechanism (Krifka 2006)
- Alternatives can be used by focus-sensitive particles, e.g. *only, also*
- They can also be used at the level of speech acts (CS updates), cf. Jacobs 1984

Focus interpretation in speech acts, structured meanings

- ⟨λx $\mathfrak{A}$[x], F, ALT(F)⟩, where
  - λx $\mathfrak{A}$(x): background,
  - F: focus meaning,
  - ALT(F): focus alternatives
- Alternative speech acts express a disjunctive condition on input CS:
  - C + ⟨ λx$\mathfrak{A}$[x], F, ALT(f)⟩ = C + $\mathfrak{A}$[F], provided that C = √C ∪ C + $\bigvee_{x \in ALT(F)} \mathfrak{A}[x]$
  - If condition not satisfied, then C is accommodated accordingly.
- Works for assertions and for monopolar questions
  - Focus in assertions presupposes a background question
  - Focus in monopolar questions presupposes a background constituent question

Krifka, Manfred. 2006. Association with focus phrases. In: Molnár, Valerie & Susanne Winkler, (eds), The architecture of focus. Berlin: Mouton de Gruyter, 105-136.

Contrastiveness in Answers

A second kind of focus:

- Hermann Paul 1919, §54:
  "Das psychologische Subj. […] kommt aber in seiner [Betonungs-] Stärke nur dann dem [psychol.] Prädikat gleich, wenn es im Gegensatz zum psychologischen Subj. eines anderen Satzes steht."
- Contrastive topic (Büring 1998, Jacobs 2001, Constant 2014), contrast (Molnár 2006), frame or delimitation (Krifka 2008).

Example:

- S_1: *Where will Karl and Fritz travel to?*
- S_2: [*KARL*]$_{CT}$ *will travel to* [*BERLIN*]$_F$*, and* [*FRITZ*]$_{CT}$ *will travel to* [*POTSDAM*]$_F$.
- Realized by L*H accent, in contrast to H* (+L%) for focus

Analysis of focus in contrastive topics as indicating alternative topics / frames:

- [*My* [*YOUNGER*]$_F$ *SISTER*]$_{CT}$ *will travel to BERLIN, and my* [*OLDER*] *sister ...*

Contrastive topics as indicating alternative conversational moves

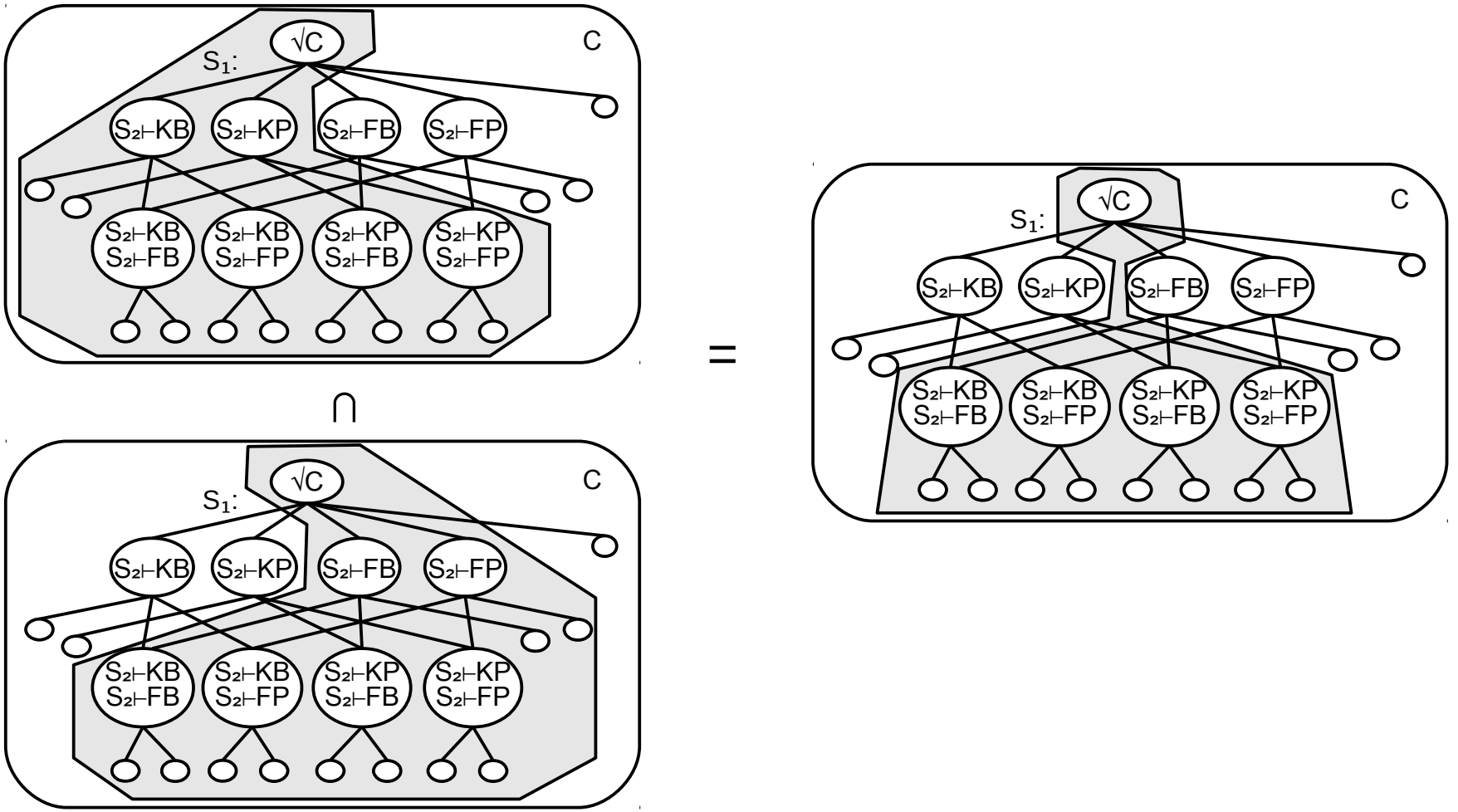
- Discourse trees (Roberts 1996, Büring 2003)
- Indicating alternative speech acts (Tomioka 2010)

Büring, Daniel. 1998. The 59th Street Bridge Accent. London: Routledge.
Jacobs, Joachim. 2001. The dimensions of topic-comment. Linguistics 39: 641-681.
Molnár, Valéria & Susanne Winkler (eds). 2006. On different kinds of contrast.
Krifka, Manfred. 2008. Basic notions of information structure. Acta Linguistica Hungarica 55: 243-276
Constant, Noah. 2014. Contrastive topics: Meaning and realizations. Ph.D. dissertation, University of Texas at Austin..

Roberts, Craige. 1996. Information structure in discourse: Towards an integrated formal theory of pragmatics. In: Yoon, J. H. & Andreas Kathol, (eds), OSU Working Papers in Linguistics 49: Papers in Semantics. Columbus: The Ohio State University, 91-136.
Büring, Daniel. 2003. On D-trees, beans, and B-accents. Linguistics and Philosophy 26: 511-545.
Tomioka, Satoshi. 2010. Contrastive topics operate on speech acts. In: Zimmermann, Malte & Caroline Féry, (eds), Information structure: Theoretical, typological and experimental perspectives. Oxford University Press, 115-138.

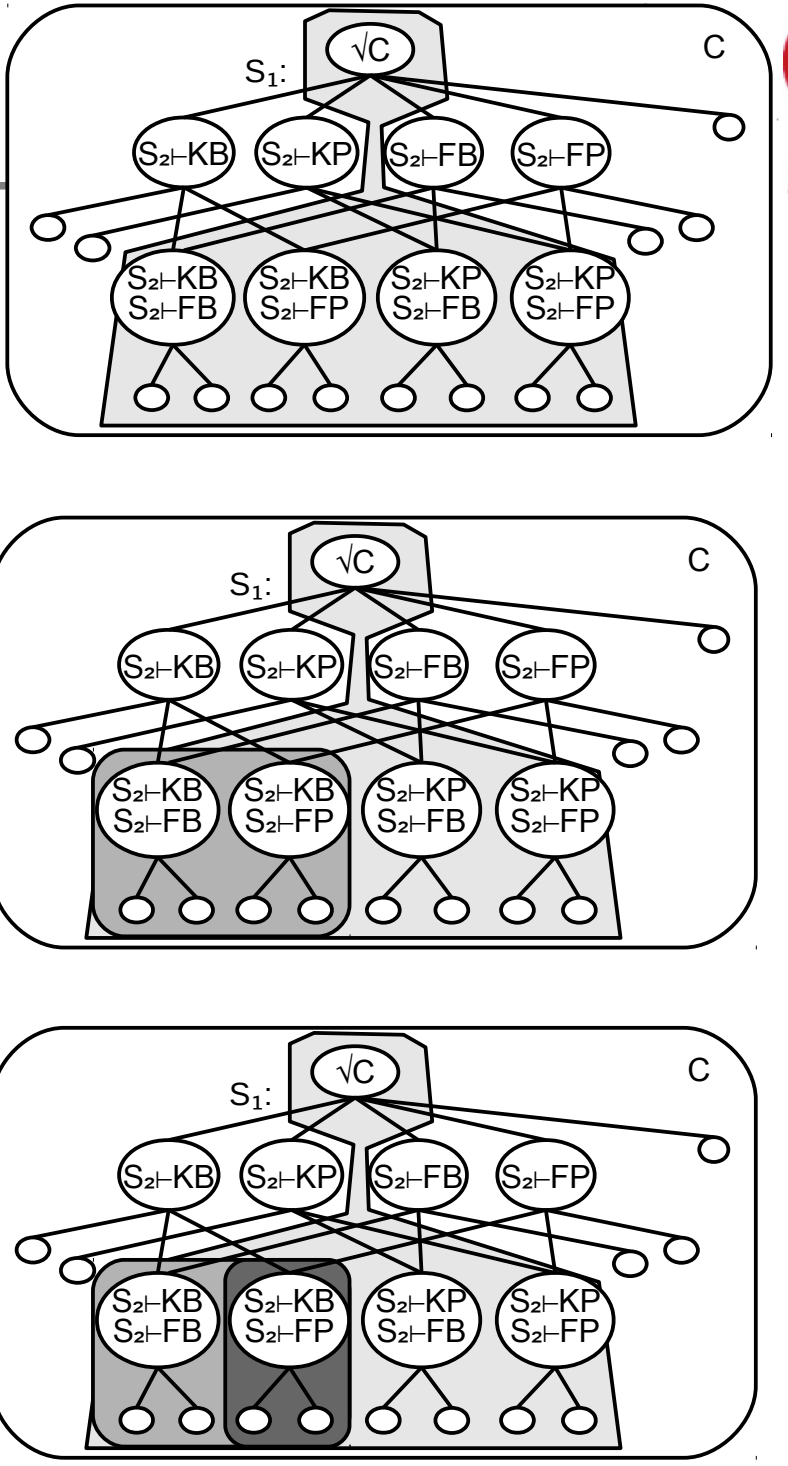
Question conjunction

- Conjoined question:
  - S_1, to S_2: *Where will Karl travel to, and where will Fritz travel to?*
  - $[\![[_{ActP}$ *where will Karl travel to*$]]\!]^{S_1S_2}$ & $[\![[_{ActP}$ *where will Fritz travel to*$]]\!]^{S_1S_2}$
    $= \lambda C[[\![[_{ActP}$ *where will Karl travel to*$]]\!]^{S_1S_2}(C)$
    $\cap\ [\![[_{ActP}$ *where will Fritz travel to*$]]\!]^{S_1S_2}(C)]$



Answering conjoined questions

- Partial answers to conjoined question
  - S_1,to S_2: *Where will Karl travel to, and where will Fritz travel to?*
  - S_2: [*KARL*]$_{CT}$ *will travel to* [*BERLIN*]$_F$ *and* [*FRITZ*]$_{CT}$ *will travel to* [*POTSDAM*]$_F$
  - First answer conjunct does not lead to a single-rooted commitment space
  - second answer results in a single-rooted commitment space
- Role of Contrastive Topic:
  - Presupposes conjoined question
  - Presupposition can be accommodated
  - The question conjuncts differ in their CT-alternatives
- Difference F and CT alternatives:
  - F alternatives presuppose disjunction
  - CT alternatives presuppose conjunction
  - CT scopes over F



Contribution of CT in Speech Acts

Recall contribution of focus in speech acts:

- Set of alternatives expresses a disjunctive condition on input CS, here modeled with structured meanings
- C + $\langle \lambda x \mathfrak{A}[x], F, ALT(F) \rangle$ = C + $\mathfrak{A}[F]$, provided that C = $[\surd C \cup C + \bigvee_{x \in ALT(F)} \mathfrak{A}[x]]$

Contribution of contrastive topic in speech acts:

- Contrastive topic introduces CT-alternatives for speech acts with focus
- CT-alternatives express a conjunctive condition on input CS
- C + $\langle \lambda y \mathfrak{A}[y], T, ALT(T) \rangle$ = C + $\mathfrak{A}[T]$, provided that C = $\&_{y \in ALT(T)} \mathfrak{A}[y]$
  where $\lambda y \mathfrak{A}[y]$: topic background, T: topic meaning, ALT(T): topic alternatives

Contrastive topic scoping over illocutionary acts with focus:

- Representation by structured meanings: $\langle \lambda y \langle \lambda x \mathfrak{A}[x][y], F, ALT(F) \rangle, T, ALT(T) \rangle$, cf. Krifka 1991
- (Or sets of sets of alternatives, cf. Büring 1998)
- C + $\langle \lambda y \langle \lambda x \mathfrak{A}[x][y], F, ALT(F) \rangle, T, ALT(T) \rangle$ = C + $\langle \lambda x \mathfrak{A}[x][T], F, ALT(F) \rangle$
  provided that C = C + $\&_{y \in ALT(T)} \langle \lambda x \mathfrak{A}[x][y], F, ALT(F) \rangle$
- Assertion part by accommodation of C: $[\surd C \cup C + \bigvee_{x \in ALT(F)} \mathfrak{A}[x][T]] + \mathfrak{A}[F][T]$
- Provision part by accommodation of C: $[C + \&_{y \in ALT(T)} [\surd C \cup \bigvee_{x \in ALT(F)} \mathfrak{A}[x][y]]]$
- Provision part and assertion part by accommodation of C:
  $[\surd[C + \&_{y \in ALT(T)} [\surd C \cup \bigvee_{x \in ALT(F)} \mathfrak{A}[x][y]]]$
  $\cup [C + \&_{y \in ALT(T)} [\surd C \cup \bigvee_{x \in ALT(F)} \mathfrak{A}[x][y]]] + \bigvee_{x \in ALT(F)} \mathfrak{A}[x][T]] + \mathfrak{A}[F][T]$
  ---------- provision for input common ground C ---------- ---------- induced change of C

Contribution of CT in Assertions

Example with contrastive topic:

- $[\![[_{ActP}\ [KARL]_{CT}\ \textit{will travel to}\ [BERLIN]_{F}]]\!]^{S_1S_2}$
  $= \langle \lambda y\ \langle \lambda x \lambda C[C + S_2 \vdash yx], B, \{B,P\}\rangle, K, \{K,F\}\rangle$, where yx: 'y will travel to x'

Provision for input commitment space C_0:

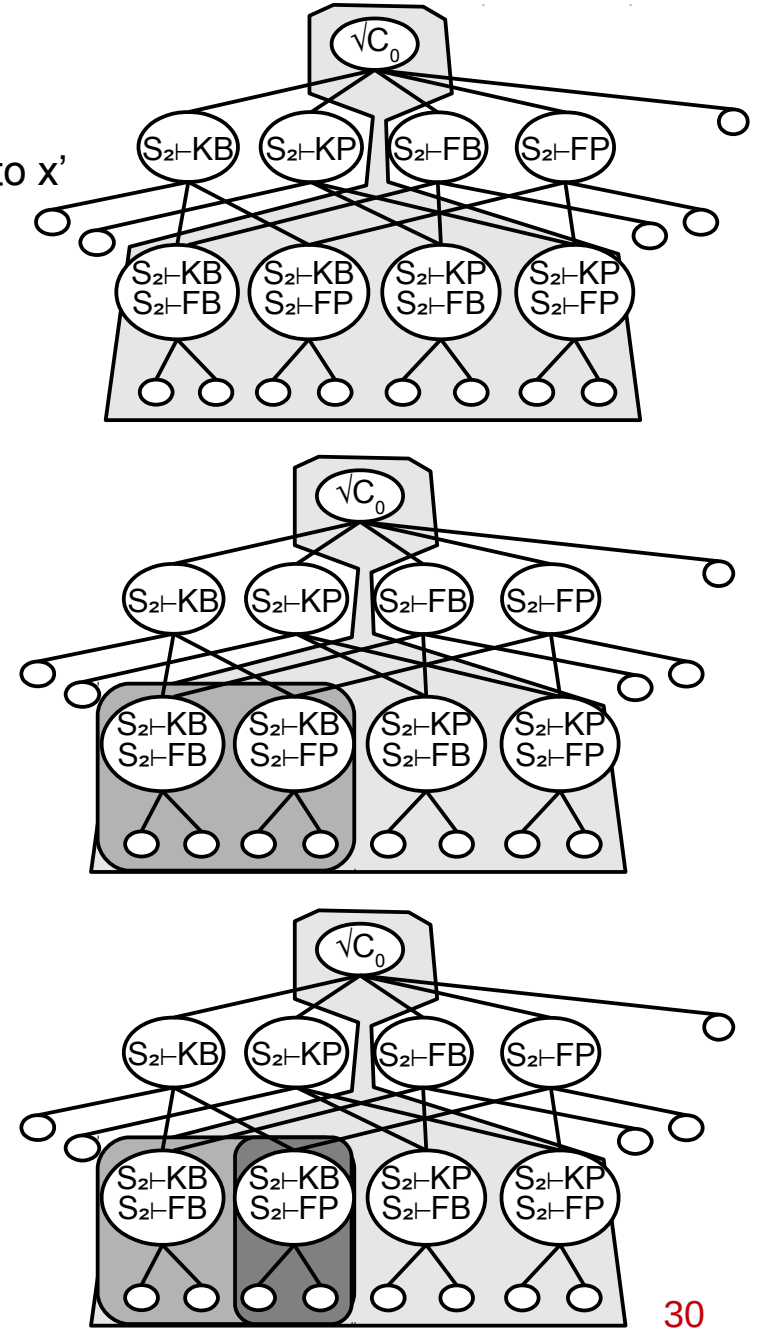
- $C_0 + \langle \lambda y\ \langle \lambda x \lambda C[C + S_2 \vdash yx], B, \{B,P\}\rangle, K, \{K,F\}\rangle$
- provided that $C_0 = C_0 + \&_{y\in\{K,F\}}\ \langle \lambda x \lambda C[C + S_1 \vdash yx], B, \{B,P\}\rangle$
- i.e. $C_0 = [C_0 + \langle \lambda C[C + S_2 \vdash Kx], B, \{B,P\}\rangle]$
  $\&\ [C_0 + \langle \lambda C[C + S_2 \vdash Fx], B, \{B,P\}\rangle]]$
- where $C_0 + \langle \lambda C[C + S_2 \vdash Kx], B, \{B,P\}\rangle$
  $= C_0 + V_{x\in\{B,P\}}\ [\surd C + S_2 \vdash Kx]$, $= C_0 + \surd C_0 \cup S_2 \vdash KB \cup S_2 \vdash KP$
  and $C_0 + \langle \lambda C[C + S_1 \vdash Fx], B, \{B,P\}\rangle$
  $= C_0 + V_{x\in\{B,P\}}\ [\surd C + S_2 \vdash Fx]$, $= C_0 + \surd C_0 \cup S_2 \vdash FB \cup S_2 \vdash FP$
- that is, in C_0 the following question is asked:
  - *Will Karl travel to BERLIN or POTSDAM, and will Fritz travel to BERLIN or POTSDAM?*

Assertion of *KARL will travel to BERLIN* at C_0:

- $C_0 + \langle \lambda y\ \langle \lambda x \lambda C[C + S_1 \vdash yx], B, \{B,P\}\rangle, K, \{K,F\}\rangle$
- C_0 satisfies requirement $C_0 = [\{\surd C_0\} \cup [S_1 \vdash KB] \cup [S_1 \vdash KP]]$
- then updated: $[\{\surd C_0\} \cup [S_1 \vdash KB] \cup [S_1 \vdash KP]] + [S_1 \vdash KP]$
- Only a partial answer: multiple rooted commitment space

Assertion of *and FRITZ will travel to POTSDAM*

- Complete answer, result in rooted commitment space.



Contribuition of CT in Questions

- Contrastive topics in assertions need an additional focus:
  - * $[KARL]_{CT}$ *will travel to Berlin.*
  - C + ⟨λyλC[C + $S_1 \vdash$ yB], K, {K,F}⟩ = C + $S_1 \vdash$ KB, provided that C = C + [$S_1 \vdash$ KB] & [$S_1 \vdash$ FB]
  - Note: this necessarily presupposes the asserted information
  - Whenever the assertion is defined, it cannot be express anything new
  - Ungrammatical, due to L-analyticity, Gajewski 2002.
- But not in questions (cf. Constant 2012, 2014):
  - (*And*) *where will* $[KARL]_{CT}$ *travel to?*
  - *Will* $[KARL]_{CT}$ *travel to Berlin* (*or not*)? – bipolar question
  - Reason: no L-analyticity, as questions offer two or more answer options
- Example:
  - C_0 + $[\![[_{ActP}$ *where* [[*will* ?] [$[KARL]_{CT}$ [$\vdash$] $[_{TP}$ t_{Karl} *travel to* t_{where}]]]]$]\!]^{S_1S_2}$
  - = [C_0 + ⟨λy[$[\![$*where will y travel to*$]\!]^{S_1S_2}$], K, {K,F}⟩]
  - Provision, accommodated: $C_0 = C_0$ +[$[\![$*where will K travel to*$]\!]^{S_1S_2}$ & $[\![$*where will* F *travel to*$]\!]^{S_1S_2}$]
  - Question asked: C_0 + $[\![$*where will* K *travel to*$]\!]^{S_1S_2}$
  - After this question is answered, question $[\![$*where will K travel to*$]\!]^{S_1S_2}$ remains.
- Also in polarity questions:
  - *Will* $[KARL]_{CT}$ *travel to Berlin?* (L*H) different from *Will* $[KARL]_F$ *travel to Berlin?* (H*)
  - Assume a bipolar question: *Will* $[KARL]_{CT}$ *travel to Berlin, or not?*

Gajewski, Jon. 2002. L-Analyticity and natural language. Ms, http://gajewskiuconnedu/researchhtml
Constant, Noah. 2012. Topic abstraction as the source for nested alternatives: A conservative semantics for contrastive topics. WCCFL. 30. 120-130.

Conclusion

- Role of focus
  - Focus indicates alternatives
  - Focus on the level of speech acts indicates alternative speech acts
  - Focus in assertions indicate alternative assertions that correspond to a context question.
  - Goal: Explain focus in questions
- Proposed framework: Commitment Spaces
  - Commitment spaces as commitment states + possible developments
  - Allows for modeling of monopolar (biased) questions and of disjunctive questions
  - Allows for modeling focus in monopolar questions (disjunctive alternatives)
  - Allows for modeling constituent questions as disjunctive monopolar questions
  - Allows for modeling contrastive topics (conjunctive alternatives), both in answers and in questions
- Nature of assertions and questions
  - With assertions, speaker commits to a proposition, the proposition itself becomes common ground by conversational implicature
  - With questions, speaker requests commitments to proposition(s) by addressee
- Further uses of Commitment Spaces:
  - Superlatives like *At most three students went to Berlin.* (Cohen & Krifka 2014)
  - Monopolar questions as biased questions (Krifka 2015)
  - Question tags as conjunctions / disjunctions: *Karl went to Berlin, didn't he / did he?* (Krifka 2015)
  - Conditionals sentences as conditional assertions/questions etc., (Krifka in progress)