Focus in Polarity Questions

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1 Issues of this talk

General context:

(1) Semantics of speech acts as **acts** that change the world by introducing new commitments (cf. Szabolcsi 1982[2])

(2) Explanation of embedding of illocutionary acts under "semantic" operators like negation, quantifiers, conditionals, predicates like *wonder* (cf. Cohen & Krifka 2011[3], Krifka t.a. a[4])

Relating to questions:

(3) Negation in polarity questions, cf. Krifka t.a. b[5]
   a. *Is there a vegetarian restaurant around here?*
   b. *Is there no vegetarian restaurant around here?* – why different from (a)?
   c. *Isn't there a vegetarian restaurant around here?* – why different from (b)?

(4) Here: Focus in polarity (yes/no) questions:
   a. *Did John order soup? – Yes. / No. / #No, Mary did. / No, he ordered salad.*
   b. *Did JOHN order soup? – Yes. / #No. / No, MARY did. / #No, he ordered salad.*

(5) Other topics
   a. Question tags: *John ordered soup, didn't he?*
   b. Focus in constituent questions: *And who ordered SOUP?*

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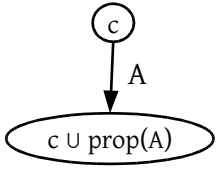
[2] Szabolcsi, Anna. 1982. Model theoretic semantics of performatives. In: Kiefer, Ferenc, (ed), *Hungarian linguistics*. Amsterdam: John Benjamins.
[3] Cohen, Ariel & Manfred Krifka. 2011. Superlative quantifiers as modifiers of meta-speech acts. *The Baltic International Yearbook of Cognition, Logic and Communication* 6: 1-56.
[4] Krifka, Manfred t.a. a, Embedding illocutionary acts. In: Roeper, Tom & Margaret Speas (eds.): *Recursion: Complexity in Cognition*. Springer.
[5] Krifka, Manfred t.a. b. Negated polarity questions. In: Lee, Chungmin e.a. (eds), Contrastiveness and scalar implicature. Berlin: Springer,

2 Basic framework for speech acts

2.1 Commitment States and Commitment Spaces

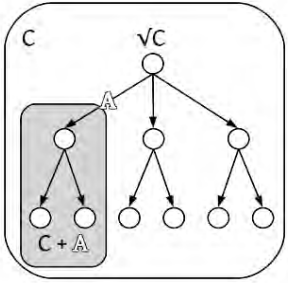


(1) **Common Ground** / **Commitment State**:
Set of publicly shared propositions, as accrued so far in conversation

(2) A speech act **A** adds propositions related to A to c.
$c + A = c \cup prop(A)$

(3) **Commitment Spaces (CS)**:
Possible **continuations** of commitment states.

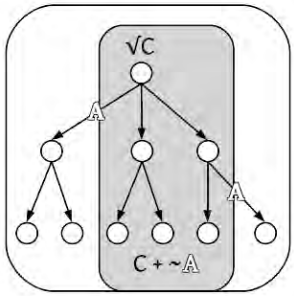
(4) C is a Commitment Space (CS) iff
a. C is a set of commitment states;
b. $\exists c \in C\ \forall c' \in C\ [c \neq \varnothing \wedge c \subseteq c']$
The unique commitment state c, (= ∩C) is the **root** of C



(5) Update of a commitment space with a speech act A,
where A is defined for commitment states:
$C + A = \{c \in C \mid \surd C + A \subseteq c\}$

(6) Example: **denegation** (cf. Searle 1969[6], Hare 1970[7]):
I don't promise to come (≠ *I promise not to come*).

(7) Update of a commitment space with the denegation of A:
$C + \sim A = C - \{c \in C \mid \exists c' \in C[c' + A \subseteq c]\}$,
i.e. exclude from C all c for which the commitments A hold.



(8) Notice: Denegation does not change the root of the input CS,
but prunes the possible future developments; it is a **meta speech act** (Cohen & Krifka 2011).

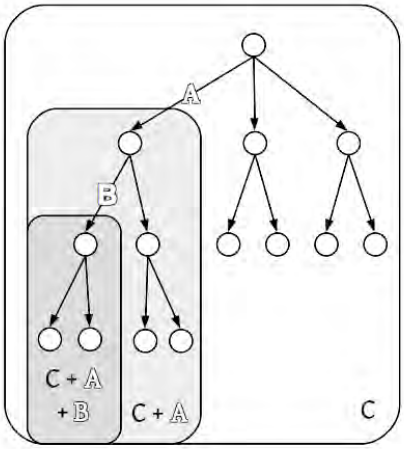
[6] Searle, John. 1969. *Speech acts. An essay in the philosophy of language*. Cambridge: Cambridge University Press.
[7] Hare, R. M. 1970. Meaning and speech acts. *The Philosophical Review* 79: 3-24.

2.2 Commitment Space Developments

(9) For non-monotonic updates we need a record of the history of how the CS developed; here: restricted to rejection of most recent acts.

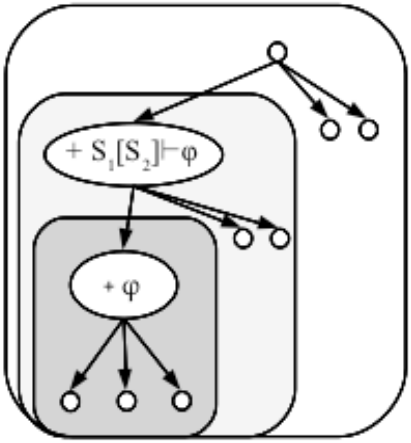
(10) This history is modeled as a **stack**, a sequence of commitment spaces, a **Commitment Space Developments (CSD)**

(11) Update of a CSD with a speech act:
⟨..., C⟩ + A = ⟨..., C, C+A⟩
- update the last commitment space of the stack: C+A
- add this commitment space to the stack.



3 Assertions and reactions to assertions

3.1 The Nature of Assertions



(1) Assertions have a double purpose:
   a. speaker expresses commitments for a proposition[8]
   b. speaker attempts to make the asserted proposition part of the common ground

(2) These two purposes can be dissociated;
in particular, (b) is not essential for assertions,
pace Bach & Harnish 1982[9]:
Believe it or not, I didn't steal the cookie.

(3) Assertive commitments:[10]
$S_1[S_2] \vdash \varphi$
S_1 has assertive commitments to S_2 w.r.t. proposition φ;
(we often leave out S_2).

(4) Interpretation of assertion as a sequence of two updates
$\langle ..., C \rangle + S_1 \vdash \varphi + \varphi$
$= \langle ..., C + S_1 \vdash \varphi,$ adding assertive commitment w.r.t. the proposition φ
$C + S_1 \vdash \varphi + \varphi \rangle$ adding the proposition φ itself

[8] For a commitment approach to assertion cf. MacFarlane, John. 2011. What is assertion? In: Brown, Jessica & Herman Cappelen, (eds), *Assertion. New philosophical essays*. Oxford: Oxford University Press,
[9] Bach, Kent & Robert M. Harnish. 1979. *Linguistic Communication and Speech Acts*. Cambridge, Mass.: MIT Press.
[10] The turnstile stands for Frege's judgement stroke, cf. *Begriffsschrift* (1879).

(5) A proposal for the syntactic and prosodic realization:

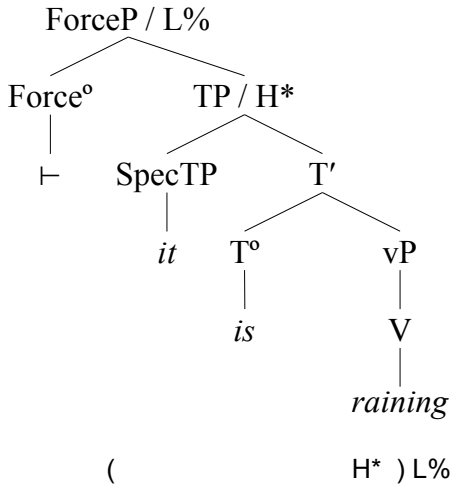
a. Syntactic realization:
TP: tense phrase, denoting a proposition,
ForceP: illocutionary force, suggested by Rizzi (1997),
cf. performative hypothesis, Ross (1970), Sadock (1974).

b. $\langle \ldots, C \rangle + [\![[_{\text{ForceP}} [_{\text{Force}^o} \vdash] [_{\text{TP}} \ldots]]]\!]^{S1,S2}$
$= \langle \ldots, C \rangle + S_1 \vdash [\![[_{\text{TP}} \ldots]]\!]^{S1,S2} + [\![[_{\text{TP}} \ldots]]\!]^{S1,S2}$

b. Boundary tone L%:
part of assertive commitment, cf. Bartels (1997)[11].

c. Nuclear stress H*: indicates that TP proposition is new in c,
as L* would mark that proposition is already in c
(cf. Pierrehumbert & Hirschberg 1990[12], Truckenbrodt 2012[13])

Additionally, filling of SpecForceP
with topical or focused expressions,
ignored here.



[11] Bartels, Christine. 1997. T*owards a compositional interpretation of English question and statement intonation*. Ph.D. Dissertation, University of Massachusetts at Amherst.
[12] Pierrehumbert, Janet & Julia Hirschberg. 1990. The meaning of intonational contours in the interpretation of discourse. In: Cohen, Philip R. & Jerry L. Morgan, (eds), *Intentions in communication*. Cambridge, Mass.: MIT Press, 271-311.
[13] Truckenbrodt, Hubert. 2012. Semantics of intonation. In: Maienborn, Claudia, Klaus von Heusinger & Paul Portner, (eds), *Semantics: An international handbook of natural language and meaning*, Vol. 3. Berlin: Walter de Gruyter,

3.2 Reaction to assertions

(6) The part ⟨..., C⟩ + $S_1 \vdash \varphi$ is accepted without any reaction, and difficult to reject:
A: *You stole my cookie.*
B: *Don't say that! / Take that back! You will regret it.*

(7) The part ⟨..., C + $S_1 \vdash \varphi$⟩ + φ is often explicitly accepted, and easy to reject:
A: *You stole my cookie.*
B: *Uh-huh. / Yes. / No.*

(8) Mechanism of response particles (cf. Krifka 2013[14], also Farkas & Roelofsen 2012[15]):
– TP of antecedent clause introduces a propositional discourse referent,
– Response particles are anaphoric on such propositional discourse referents and assert them as speech acts.

(9) The move + φ corresponds to the "projected set" in Farkas & Bruce (2011)[16], the move + $S_1 \vdash \varphi$ roughly corresponds to the commitments of S_1

[14] Krifka, Manfred. 2013. Response particles as propositional anaphors. Semantics and Linguistic Theory (SALT). 23. 1-18.
[15] Farkas, Donka F. & Floris Roelofsen. 2012. Polar initiatives and polar particle responses in an inquisitive discourse model. Manuscript
[16] Farkas, Donka F. & Kim B. Bruce. 2010. On reacting to assertions and polar questions. *Journal of Semantics* 27: 81-118.

3.3 Acceptance and Rejection

(10) Answer *okay, uh-huh,* or no reaction: S_2 accepts the proposed commitment space.
$\langle ..., C + S_1 \vdash \varphi, C + S_1 \vdash \varphi + \varphi \rangle + ACCEPT_{S2}$
$= \langle ..., C + S_1 \vdash \varphi, C + S_1 \vdash \varphi + \varphi \rangle$

(11) Answer *yes*: S_2 asserts the same proposition:
$\langle ..., C + S_1 \vdash \varphi, C + S_1 \vdash \varphi + \varphi \rangle + S_2 \vdash \varphi$
$= \langle ..., C + S_1 \vdash \varphi, C + S_1 \vdash \varphi + \varphi, C + S_1 \vdash \varphi + \varphi + S_2 \vdash \varphi \rangle$
yes picks up a propos. discourse referent introduced by the TP of the antecedent clause

(12) Answer *no*: S_2 negates the same proposition;
for consistency, this requires a previous rejection by a REJECT operation,
as a common ground c cannot contain both φ and $S_2 \vdash \neg\varphi$:
$\langle ..., C + S_1 \vdash \varphi, C + S_1 \vdash \varphi + \varphi \rangle + REJECT_{S2} + S_2 \vdash \neg\varphi$
$= \langle ..., C + S_1 \vdash \varphi, C + S_1 \vdash \varphi + \varphi, C + S_1 \vdash \varphi, C + S_1 \vdash \varphi + S_2 \vdash \neg\varphi \rangle$

(13) Notice that *no* does not itself reject, but enforces a prior rejection,
no rejection e.g. in confirming responses to assertion that is negated:
S_1: *Ed didn't steal a cookie.*
S_2: *No, he didn't.*

(14) REJECT can be expressed by particles,
cf. Romanian *ba*, Hungarian *de* in Farkas & Roelofsen (to appear)[17]

[17] Farkas, Donka F. & Floris Roelofsen. 2012. Polar initiatives and polar particle responses in an inquisitive discourse model. Manuscript

4 Polarity questions

4.1 Interpretation of polarity question as flipped assertions

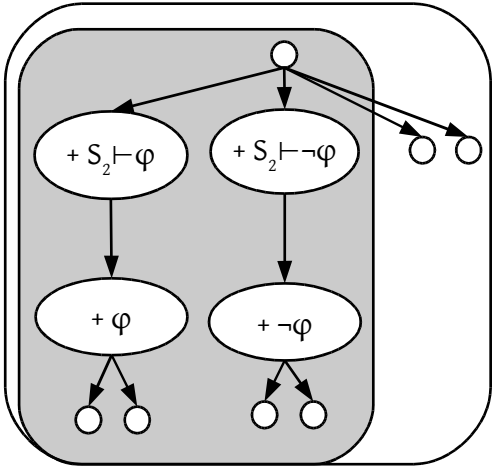
(1) Question radicals vs. questions speech acts:
a. *Mary knows* [$_{CP}$ *whether* [$_{TP}$ *John arrived*]]
b. *Did John arrive?*

(2) Question radicals: A set of propositions (cf. Hamblin 1973):
[$_{CP}$ *whether* [$_{TP}$ *John arrived*]],
interpreted as {'John arrived', ¬'John arrived'}, = {φ, ¬φ}

(3) Use in embedded questions (simplified):
Mary knows whether John arrived.
λi∀p∈Φ[p(i) → Mary knows in i that p]

(4) Syntax of polar question speech act, illocutionary operator: ?
complementizer not realized
[$_{ForceP}$ [$_{Force'}$?-*did* [$_{CP}$ ~~*whether*~~ [$_{TP}$ *John* t_{did} *arrive*]]]]

(5) Interpretation as a meta speech act:
⟨..., C⟩ + S_1, to S_2: [$_{ForceP}$?-*did* [$_{CP}$ ~~*whether*~~ [$_{TP}$ *John arrive*]]
= ⟨..., C, {√C} ∪ {C + S_2⊢p + p | p ∈ {φ, ¬φ}⟩



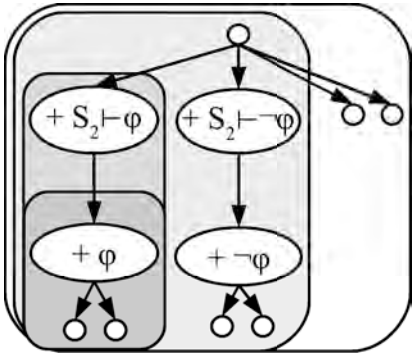
4.2 Answers to polarity questions

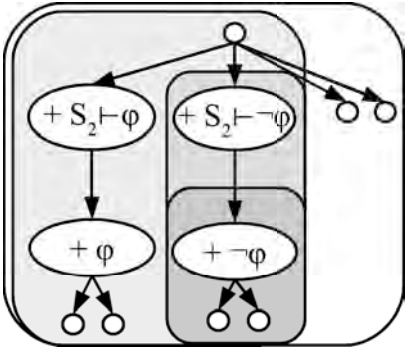
(6) Congruent answers
specify one of the options:

a. *Yes* :
Picks up discourse referent for TP,
φ = 'John arrived',
S_2 asserts the proposition
of this discourse referent, φ.

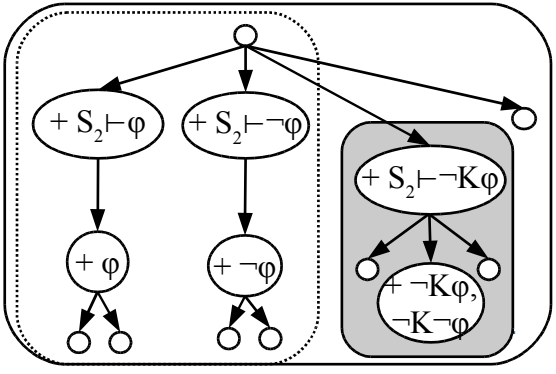
b. *No* :
Picks up discourse referent for TP,
φ = 'John arrived',
S_2 asserts the negation of the proposition
of this discourse referent, ¬φ

Observe:
Different from reaction *no* to assertion,
as prior rejection is not required.





(7) Incongruent answers, e.g. *I don't know:*
Requires first a REJECT operation,
followed by assertion $S_2[S_1]\vdash$'S_2 does not know wether φ';
REJECT is necessary due to pragmatic inconsistency
of $S_1\vdash\varphi$, $S_1\vdash\neg K\varphi$ and $S_1\vdash\neg\varphi$, $S_1\vdash\neg K\neg\varphi$,
cf. Moore's paradox:
#*John has arrived,*
but I don't know that he has arrived.



4.3 Evidence for questions as flipped assertions

(8) Interrogative flip with reportatives, evidentials
(Speas & Tenny 2003[18], Faller 2006[19]).
What has John reportedly done?
Expected answer: *She (reportedly) called the boss an idiot.*

(9) Interpretation of discourse particles
(Zimmermann 2004[20], German *wohl*):

a. *Es wird wohl regnen.*
'Presumably, it will rain.'

b. *Wird es wohl regnen?*
'Will it rain, presumably?'

(10) Egophoricity
(cf. Creissels 2008[21], conjunct/disjunct systems;
here Northern Ahkvahk, NE Caucasian)

a. *de-de kaʁa qwar-ada*
1s-ERG paper write-EGO
'I wrote a letter'

b. *me-de čuda kaʁa qwar-ada*
2s-ERG when paper write-EGO
'When did you write a letter?'

c. *me-de kaʁa qwar-ari*
2s-ERG paper write-N.EGO
'You wrote a letter.'

d. *de-de čuda kaʁa qwar-ari*
1s-ERG when paper write-N.EGO
'When did I write a letter?'

[18] Speas, Margaret & Carol Tenny. 2003. Configurational properties of point of view roles. In: di Sciullo, Anna Maria, (ed), Asymmetries in grammar. John Benjamins,
[19] Faller, Martina & Rachel Hastings. 2008. Cuzco Quechua quantifiers. In: Matthewson, Lisa, (ed), Quantification. A cross-linguistic perspective. Bingley: Emerald, 277-318.
[20] Zimmermann, Malte. 2004. Zum Wohl: Diskurspartikeln als Satztypmodifikatoren. Linguistische Berichte 199: 253-286.
[21] Creissels, Denis. 2008. Remarks on so-called "conjunct/disjunct" systems. Conference on *Syntax of the World's Language* Berlin.

4.4 Monopolar questions

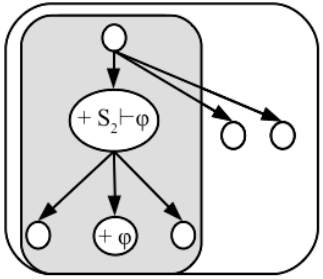
(11) Declarative questions with bias, cf. Gunlogson (2002)[22]:
There is a vegetarian restaurant around here?
Prosodic signature of this reading: L*H%,
in contrast to regular bipolar questions, which allow for H* L%,
cf. Bartels 1999, Kügler 2003 for discussion.

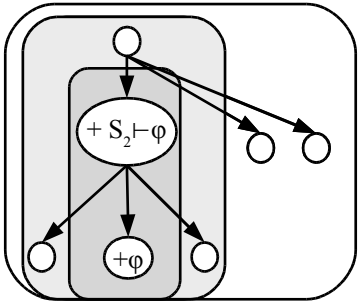
(12) Assume meta speech act operator REQU:
$C + REQU_{S1,S2}(A) = \{\sqrt{C}\} \cup C + A_{S2,S1}$
i.e. S_1 requests from S_2 to perform the speech act A.
In declarative questions, REQU is expressed solely by prosody:
H% boundary tone: Authority shift to addressee,
L* nuclear tone: No commitment to proposition.

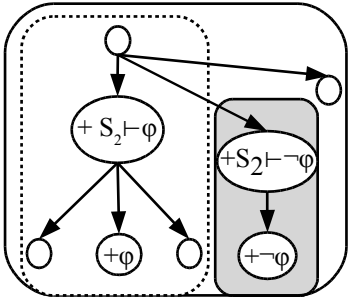
(13) $C + REQU_{S1,S2}([_{ForceP} \vdash [_{TP}$ *John arrived*$]]) = \{\sqrt{C}\} \cup C + S_2 \vdash \varphi$;
notice that this is a question that proposes only one continuation
(**monopolar** question vs. **bipolar** question;
cf. Bolinger 1989, questions for confirmation vs. information)

(14) **Congruent** answer *yes* picks out the only proposed continuation.
Answer *no* is an **incongruent** answer, requires a REJECT operation,
hence more complex than *yes* – question bias!.

(15) Notice: No obvious way to express monopolar questions in frameworks
like Hamblin, Groenendijk/Stokhof, Inquisitive semantics.







[22] Gunlogson, Christine. 2002. Declarative questions. SALT XII. Ithaca, NY: Cornell University, 124-134.
Bolinger, Dwight. 1989. *Intonation and its uses.* London: Arnold.
Bartels, Christine. 1999. *The intonation of English questions and intonation*. A compositional approach. Garland.
Kügler, Frank. 2003. Do we know the answer? Variation in yes-no question intonation. *Ling. in Potsdam* 21.

4.5 Negation in polarity questions

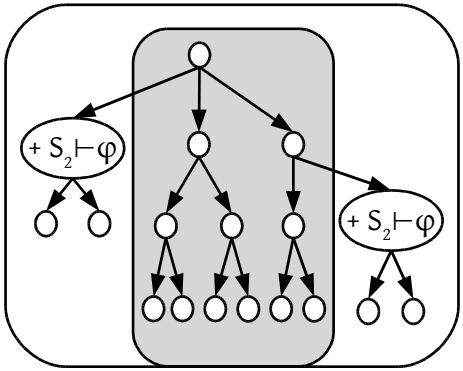
(16) Polarity question based on a negated proposition with special rhetorical effect, e.g. disbelief:
Is there no vegetarian restaurant around here?,
Under bipolar analysis we cannot explain this effect, as: {φ, ¬φ} = {¬φ, ¬¬φ}
Here: Analysis as monopolar question, expressing the bias.

(17) Hence we have to assume that REQUEST can also be expressed by syntax, like ?:
$[_{ForceP}$ [REQU-*did* $[_{ForceP}$ *John* [⊢ $[_{TP}$ t_{John} t_{did} *arrive*]]]]];
notice: there is no question radical, but an embedded assertion.

(18) This opens an option to treat syntactically high negation (cf. Ladd 1981[23]) as denegation (Krifka to app.[24]):
Didn't John arrive? (on high negation reading).
$[_{ForceP}$ [REQU-*did* $[_{NegP}$ *n't* $[_{ForceP}$ *John* [⊢ $[_{TP}$ t_{John} t_{did} *arrive*]]]]]

(19) $C + REQU_{S1,S2} (\sim (\vdash \varphi))$
$= \{\sqrt{C}\} \cup [C + \sim S_2\vdash \varphi]$
$= \{\sqrt{C}\} \cup [C — \{c\in C \mid \exists c'\in C[c' + S_2\vdash\varphi \subseteq c]\}]$,
i.e. S_1 requests that S_2 rules out the assertion that φ by S_2.

(20) See Krifka (to app.) for the derivation of the neutral or negative bias of such questions.



[23] Ladd, D. Robert. 1981. A first look at the semantics and pragmatics of negative questions and tag questions. Proceedings of the Chicago Linguistic Society. 17. Chicago: 164-171.
[24] Krifka, Manfred. to appear. Negated polarity questions as denegations of assertions. In Lee, Chungmin e.a. (eds.), *Contrastiveness and scalar implicatures.* Springer.

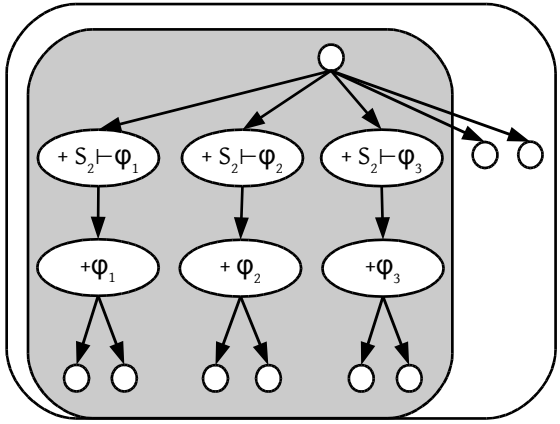
5 Constituent questions

5.1 Asking constituent questions

(1) Constituent question radical: Set of propositions.
   a. Propositions may overlap (Hamblin 1973)[25]:
      $[_{CP}$ *who* $[t_{who}$ *arrived*$]]$
      = {'x arrived' | x∈PERSON}, = Φ
      e.g. {'John arrived', 'Mary arrived', 'Sue arrived'}
   b. Set is a partition, propositions do not overlap (Groenendijk & Stokhof 1984)[26]
      e.g. {'Only John arrived, 'Only Mary arrived', ...'}

(2) Constituent question radical in embedded questions:
   Bill knows who arrived.
   proposition: λi[∀p∈Φ[p(i) → Bill knows in i that p]]

(3) Constituent question speech act:
   $[_{ForceP}$ *who* $[$*?-did* $[_{CP}$ t_{who} $[t_{who}$ t_{did} *arrive*$]]]]$
   ⟨..., C⟩ + S_1, to S_2: *Who did arrive?*
   = ⟨..., C, {√C} ∪ {C + S_2⊢p | p ∈ Φ}⟩,
   proposed continuations restricted to assertions by the addressee (S_2) of propositions in the question radical.



(4) Under Groenendijk & Stokhof approach: Continuations do not overlap;
under Hamblin approach: Continuations may overlap; non-overlap enforced by pragmatics?

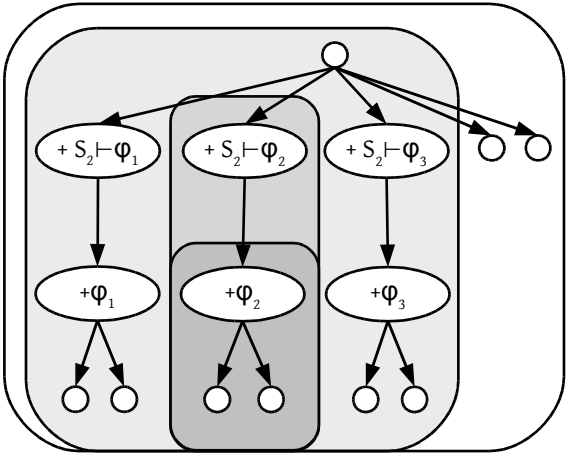
[25] Hamblin, C.L. 1973. Questions in Montague English. *Foundations of Language* 10: 41-53.
[26] Groenendijk, Jeroen & Martin Stokhof. 1984. Studies on the semantics of questions and the pragmatics of answers. Doctoral Dissertation. University of Amsterdam.

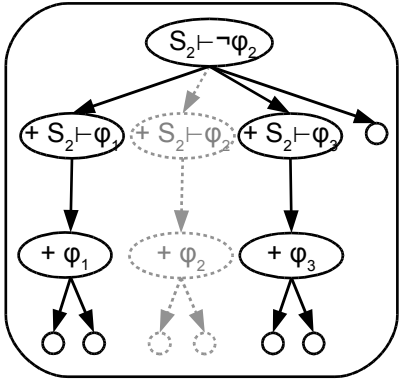
5.2 Answering constituent questions

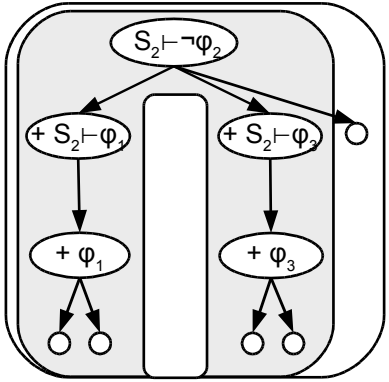
(5) Fully congruent answer to a question:
$[_{ForceP} \vdash [_{IP}$ *John arrived*$]]$
Takes up one of the proposed continuations.
$\langle ..., C, C' \rangle + S_2 \vdash \varphi_2 + \varphi_2$,
where $C' = \{\sqrt{C}\} \cup \{C + S_2 \vdash p \mid p \in \Phi\}$,
φ_2 = 'John arrived'
$= \langle ..., C, C', C' + S_2 \vdash \varphi_2, C' + S_2 \vdash \varphi_2 + \varphi_2 \rangle$
$= C''$

(6) Reaction *I don't know*
Requires prior (double) rejection,
then assertion: $S_2 \vdash$ 'S_2 does not know':
$C'' + REJECT_{S2} + REJECT_{S2} +$
$+ S_2 \vdash \neg$'S_2 knows who arrived'
$+ \neg$'S_2 knows who arrived'$\rangle$

(7) Reaction *Not John.*
Option a: wh ranges over quantifiers
like *not John*; then: congruent answer.
Option b: partial answer;
If $C' + A$ is not defined, then
$\langle ..., C, C' \rangle + A = \langle ..., C, C+A, C+A \cap C' \rangle$
justified: reduction of options of C'

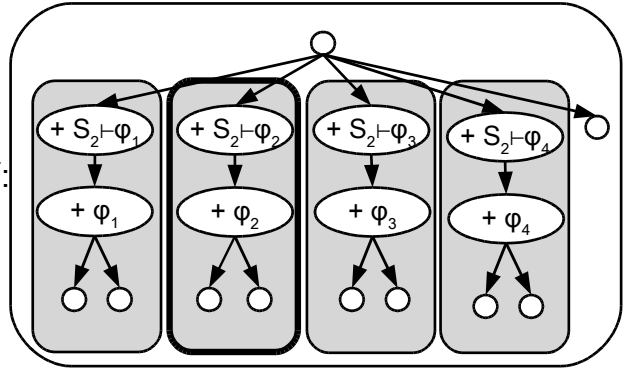






5.3 Focus in assertions

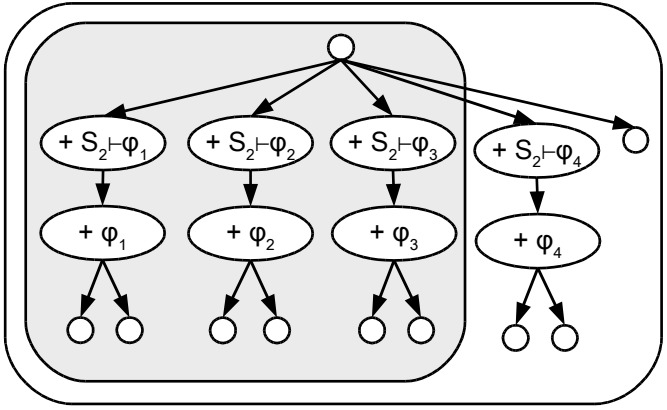
(8) Focus to mark congruence of answer to question:
S_1: *Who did arrive?*
S_2: *JOHN$_F$ arrived.*



(9) Focus indicates propositional alternatives (Rooth 1992)[27]:
modeled by a pair of a proposition and its alternatives:
⟨'John arrived', {'x arrived' | x ∈ THING}⟩,
= ⟨'John arrived', Ψ⟩

(10) Computation of alternative assertions:
Focus projects to the illocutionary level.
⟨$S_2\vdash$ 'John arrived', {$S_2\vdash$'x arrived' | x∈ THING}⟩,
= ⟨A, A⟩
a pair of an illocutionary act and a set of illocutionary acts,

(11) Question/answer congruence (following Rooth):
Every legal move after Q* = *Who did arrive?*
is an alternative of the assertion *JOHN$_F$ arrived.*



(12) In general: C + ⟨A, A⟩ = C + A,
provided that ∀A′[C + A′ is defined → A′ ∈ A]

(13) This requirement can also be **accommodated**,
to deal with implicit questions:
a. ⟨..., C⟩ + ⟨A, A⟩: not defined;
b. ⟨..., C⟩ + Q* + ⟨A, A⟩,
where Q*: a suitable question act,
= ⟨..., C, C+Q*, C+Q*+A⟩

[27] Rooth, Mats. 1992. A theory of focus interpretation. *Natural Language Semantics* 1: 75-116.

6 Focus in polarity questions

6.1 General observations

(1) Example: *Did JOHN$_F$ arrive?*
Congruent answers: *Yes. / No, BILL$_F$ arrived.*

(2) Dedicated focus marker for polarity questions in Slavic languages: *li,* in Turkish *mI*
cf. e.g. Dukova-Zheleva (2010)[28] for Bulgarian:

a. *Risuva li Ivan vseki den?*
draws LI Ivan every day
'Does Ivan draw/DRAW every day?'

b. *Ivan li risuva vseki den?*
Ivan LI draws every day
'Does IVAN draw every day?'

cf. e.g. Kamali & Büring (2011)[29] for Turkish:

c. *Ali dün ıskambil mi oynadı?*
Ali yesterday cards MI played?
'Did Ali play CARDS yesterday?'

d. *Ali dün mü ıskambil oynadı?*
Ali yesterday MI cards play?
'Did Ali play cards YESTERDAY?'

(3) Observations with regard to focus in polarity questions:

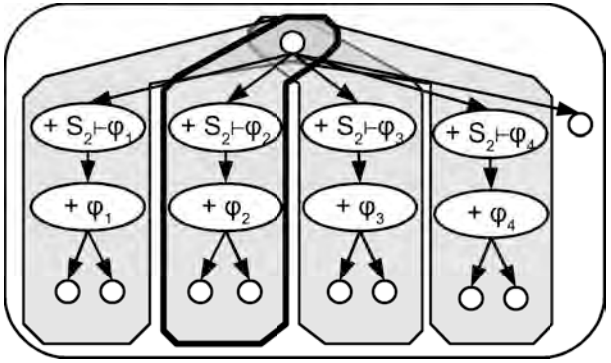
a. This kind of focus in polarity questions requires the monopolar reading: it is biased towards the proposition 'John arrived'.

b. As a consequence, it should be possible also in declarative questions, and it is: *JOHN$_F$ arrived? – No, Mary.*

c. Equivalent to specified constituent question (cf. Bäuerle 1979)[30]: *Who arrived? John?*

[28] Dukova-Zheleva, Galina. 2010. Questions and focus in Bulgarian. Doctoral dissertation. University of Ottawa.
[29] Kamali, Beste & Danile Büring. Ms., 2011. Topics in questions. http://homepage.univie.ac.at/glow34.linguistics/kamali.pdf
[30] Bäuerle, Rainer. 1979. Questions and answers. In: Bäuerle, Rainer, U. Egli & Arnim von Stechow, (eds), *Semantics from different points of view.* Berlin: Springer, 61-74.

6.2 Analysis of focus in polarity questions

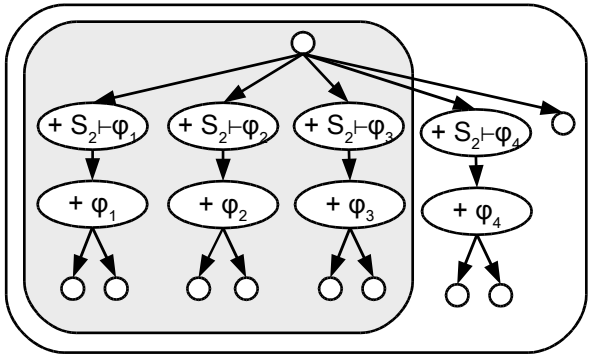


(4) Focus indicates a commitment space C
in which the alternative **monopolar** questions are asked;
this corresponds to the general rule (12).

(5) $[_{ForceP}$ [REQU-*did* $[_{ForceP}$ *John*$_F$ $[\vdash$ $[_{TP}t_{John}$ t_{did} *arrive*]]]]
$\langle Q, \underline{Q}\rangle$,
where the elements of $\underline{Q}$ are monopolar questions:
$\langle S_2\vdash$'John arrived', {$S_2\vdash$'x arrived' | x∈THING}$\rangle$

(6) $\langle ..., C\rangle + \langle Q, \underline{Q}\rangle = \langle ..., C\rangle + Q$,
provided that $\forall Q'[C + Q'$ is defined $\rightarrow Q'\in\underline{Q}]$

(7) This requirement is satisfied if *Who did arrive?* (= Q*)
was asked immediately before:
Who did arrive? (Did) JOHN (arrive)?



(8) Like with focused assertions, Q* is accommodated:
a. $\langle ..., C\rangle + \langle Q, \underline{Q}\rangle$: not defined;
b. $\langle ..., C\rangle + Q^* + \langle Q, \underline{Q}\rangle$, where Q*: suitable question,
$= \langle ..., C, C+Q^*, C+Q^*+Q\rangle$

(9) Generalization over assertions (12) and questions (6):
If α is an illocutionary act with a set of alternatives $\underline{\alpha}$,
$\langle ..., C\rangle + \langle \alpha, \underline{\alpha}\rangle = \langle ..., C\rangle + \alpha$,
provided that
$\forall \alpha'$, where α' of the type of acts in $\underline{\alpha}$ (assertions, questions)
$[C + \alpha'$ is defined $\rightarrow \alpha'\in\underline{\alpha}]$

6.3 Answers to polarity questions with focus

(10) *Did JOHN arrive?*
Corresponds to: *Who did arrive? (Did) John (arrive)?*

(11) Answer *Yes* :
S_2 asserts [$_{TP}$ *John arrived*]

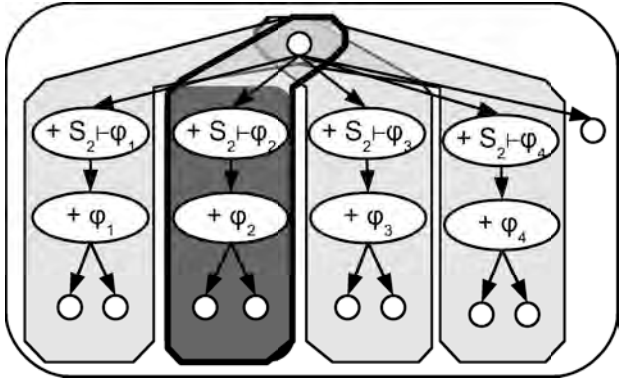
(12) ⟨..., C, C+Q*, C+Q*+Q⟩+ A: a legal move,
= ⟨..., C, C+Q*, C+Q*+Q, C+Q*+Q+A⟩

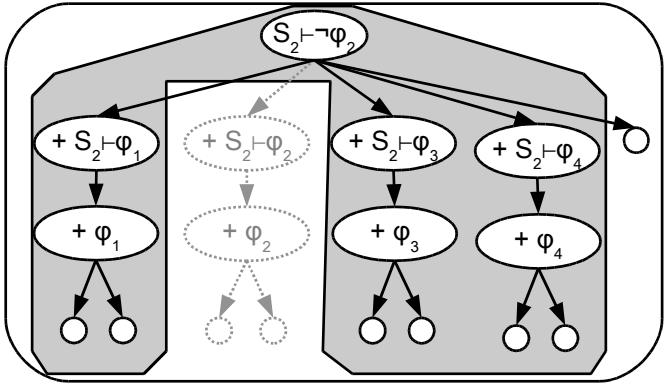
(13) Answer *No* :
S_2 asserts the negation of [$_{TP}$ *John arrived*],
abbrev: $A_{\neg}$
⟨..., C, C+Q*, C+Q*+Q⟩ + $A_{\neg}$: not a legal move,
due to incompatibility of propositions of Q and $A_{\neg}$

(14) REJECT operation leads to:
⟨..., C, C+Q*, C+Q*+Q⟩ + REJECT = ⟨..., C, C+Q*⟩
where Q*: *Who did arrive?*

(15) $A_{\neg}$ is not a legal move at this position either;
following rule (7), Option (b):
= ⟨..., C, C+Q*⟩ + $A_{\neg}$ = ⟨..., C+$A_{\neg}$, C+$A_{\neg}$ ∩ C+Q*⟩

(16) In the resulting state, it is
– established that John did not arrive ($A_{\neg}$),
– the remaining legal moves are answers
to the question *Who did arrive?*





7 Additional topics

7.1 Tag questions

(1) S_1, to S_2: *John arrived, didn't he?*

(2) Analysis as a **disjunction** of two speech acts:
- Assertion: *John arrived?*
- Monopolar question: *Did John not arrive?*

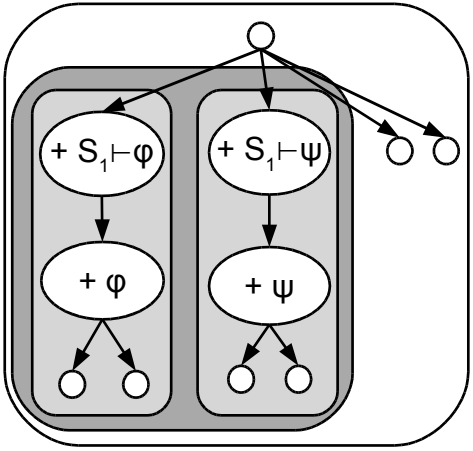
(3) Disjunction of speech acts: $C + [A \vee A'] = C + A \cup C + A'$

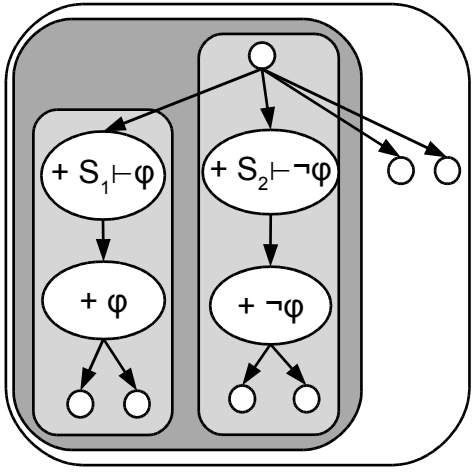
(4) For speech acts like assertions, disjunction is infelicitous, as it results in a non-rooted commitmen space:
$C + [[S_1 \vdash \varphi + \varphi] \vee [[S_1 \vdash \psi + \psi]]$
$= [C + S_1 \vdash \varphi + \varphi] \cup [C + S_1 \vdash \psi + \psi]$

(5) Hence disjunction is interpreted at the level of propositions:
S_1: *John arrived or Mary arrived.*
$C + S_1 \vdash$ ['John arrived' $\vee$ 'Mary arrived']

(6) But disjunction of an assertion and a monopolar question results in a rooted CS and is fine:
S_1: *John arrived, didn't he?*
$C +$ [S_1 to S_2: *John arrived* $\vee$ S_1 to S_2: *John did not arrive?*]
$= [C + S_1 \vdash \varphi + \varphi] \cup [\{\sqrt{\mathbf{C}}\} \cup C + S_2 \vdash \neg\varphi + \neg\varphi]$

(7) Answer *yes* picks up proposition φ – reaction to assertion part.
answer *no* picks up proposition φ and asserts its negation – reaction to monopolar question.





7.2 Focus in constituent questions indicate backburner questions

(8) *What did ED eat?*

(9) Such question speech acts evoke alternative question speech acts that are explicitly not asked: because they are put on hold (**"backburner questions"**):
I am interested in what Ed and Bill ate. Let's start with Ed. What did HE eat?

(10) Proposal for questions with alternatives:
S_1: *What did ED_F eat?*

a. Question radical, Hamblin representation:
$[_{CP}$ *what* $[_{TP}$ *Ed ate* $t_{what}]]$ = {'Ed ate x' | x∈THING}, = Φ, a set of propositions

b. Question speech act, as a function on CS:
λC[{√C} ∪ {C + S_2⊢ 'Ed ate x' | x∈THING}], = Q, a question act

c. Alternatives introduced by focus on *Ed,* assuming that alternatives to *Ed* are persons:
{λC[{√C} ∪ {C + S_2⊢ 'y ate x' | x∈THING}] | y ∈ PERSON}, = $\underline{Q}$, a set of question acts

(11) Asking a question with alternatives:
⟨..., C⟩ + ⟨Q, $\underline{Q}$⟩ = ⟨..., C, ⟨C+Q, $\underline{Q}$⟩⟩, where C+Q = Q(C)

(12) Answering a question with alternatives (where $\underline{Q}$–Q = $\underline{Q}$ \ Q, provided that Q∈$\underline{Q}$, else undefined):
⟨..., ⟨C+Q, $\underline{Q}$⟩⟩ + A = ⟨..., ⟨C+Q, $\underline{Q}$⟩, ⟨C+Q+A, $\underline{Q}$–Q⟩⟩, removal of Q from backburner questions.

(13) Answering remaining questions:
⟨..., ⟨C, $\underline{Q}$⟩⟩ + A: attempt to find a Q*∈Q, then interpret as ⟨..., ⟨C+Q*, $\underline{Q}$⟩⟩ + A

(14) Generalization:
– take ⟨..., C⟩ as abbreviation of ⟨..., ⟨C, ∅⟩⟩: no remaining backburner questions
– have ⟨..., ⟨C, $\underline{Q'}$⟩⟩ + ⟨Q, $\underline{Q}$⟩⟩ = ⟨..., ⟨C, $\underline{Q'}$⟩, ⟨C+Q, $\underline{Q'}$ ∪ $\underline{Q}$⟩⟩: new backburner questions added

7.3 Answer to questions with backburner questions

(15) Contrastive topic answers to questions: van Kuppevelt 1996, Roberts 1996, Büring 2003.[31]

(16) S_1: *What did ED_F eat?* Question indicating a backburner question
S_2: *ED_{CT} ate a $COOKIE_F$.* Contrastive topic indicates backburner question.

(17) S_2: $[_{ForceP} \vdash [_{TP}$ *Ed ate a cookie*$]]$:
$\lambda C[C + S_2 \vdash$ 'Ed ate a cookie'$]$, = A – only commitment part is indicated, for simplicity

(18) S_2: $[_{ForceP} \vdash [_{TP}$ *Ed ate a $COOKIE_F$*$]]$:
$\langle A, \{\lambda C[C + S_2 \vdash$ 'Ed ate x' $] \mid x \in THING\}\rangle$, focus indicating alternative answers

(19) Reminder, interpretation of assertion with focus as responding to *wh*-question:
$C+Q + \langle A, \underline{A}\rangle = C+Q+A$, provided that $\forall A'[C+Q+A'$ is defined $\rightarrow A' \in \underline{A}]$

(20) Effect of contrastive topic intonation:
S_2: $[_{ForceP} \vdash [_{TP}$ *ED_{CT} ate a $COOKIE_F$*$]]$:
$\langle\langle A, \{\lambda C[C + S_2 \vdash$ 'Ed ate x'$] \mid x \in THING\}\rangle, \{\lambda C[C + S_2 \vdash$ 'y ate x'$] \mid x \in THING, y \in PERSON\}\rangle$
$= \langle\langle A, \underline{A}\rangle, \underline{A}\rangle$

(21) Answer with contrastive topics:
$\langle ..., \langle C+Q, \underline{Q}\rangle\rangle + \langle\langle A, \underline{A}\rangle, \underline{A}\rangle = \langle ..., \langle C+Q\rangle, \langle C+Q+\langle A, \underline{A}\rangle, \underline{Q}–Q\rangle\rangle$,
provided that $\forall A'\forall Q' \in \underline{Q}[C+Q'+A'$ is defined $\rightarrow A' \in \underline{A}]]$
– Answer with focus alternatives $\langle A, \underline{A}\rangle$
– Make sure that the CT-alternatives in $\underline{A}$ answer correspond to question alternatives in $\underline{Q}$.
(Each legal answer to a question alternative must be a CT-alternative of the answer given.)

[31] van Kuppevelt, Jan. 1995. Discourse structure, topicality, and questioning. *Journal of Linguistics* 31: 109-147. – 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.

7.4 Another kind of focus in polarity questions

(22) Polarity questions can be marked for focus alternatives as well, to create backburner questions:
I'm interested in whether Bill and Ed ate a cookie. Let's start with one of them.
Did BILL eat a cookie?

(23) This is different from focus in polarity questions discussed above:
I notice that a cookie is missing. Bill and Ed were in the room. Did ED eat the cookie?

The answer patterns are different:

(24) S_1: (22). S_2: *Yes, he did.* – still incomplete, as information about Bill is missing.
S_1: (23). S_2: *Yes, he did.* – a complete answer.

(25) S_1: (22). S_2: *No, but* $BILL_{CT}$ DID_F.
S_1: (23). S_2: *No,* $BILL_F$ *did.*

(26) The marking patterns are different in Turkish (Kamali & Büring 2011), with final *mI*:
ALI iskambıl oynar mı?
Ali cards plays MI
'Did ALI play cards?', 'Was ALI one of the people that played cards?'
Non-exhaustive interpretation, *Ali* is a contrastive topic, not a focus.

(27) Analysis as **bipolar** question,
where focus marks contrastive topic and introduces question alternatives,
similar to focus in constituent questions.

(28) We have to distinguish between:
– Contrastive topics in questions in general (constituent and polarity)
– Focus in polarity questions, a genuine phenomenon.

8 Conclusion

(29) I have argued for:

a. distinction between question sentence radicals and question speech acts
b. speech acts as changes of commitment states
c. speech acts as changes of commitment spaces,
   reflecting possible continuations
c. question speech acts are flipped assertions:
   they request assertions, and hence restrict the space of legal continuations.
d. there are two kinds of polarity questions,
   bipolar questions that propose two continuations, and monopolar questions that propose one.
e. Declarative questions and questions with negated propositions are monopolar,
   proposition-external negation in polarity questions are requests to denegate assertions.
f. Constituent questions restrict the legal continuations to assertions of the propositions
   in their question radical.
g. Focus in assertions presupposes such legal continuations.
h. Focus in monopolar questions presuppose that alternative monopolar questions
   have been asked;
   if answered negatively, the addressee is requested to perform one of these assertions.
i. Focus in constituent questions and bipolar questions indicate question alternatives.
j. Contrastive topic marker in answers presupposes congruent question alternatives.
k. Tag questions are disjunctions of assertions and questions.