Modeling questions and responses

Lecture 4: the dynamics of responses

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Outline
Some empirical desiderata

Stalnakerian context
  Responding to assertions

A Stalnakerian account for questioning

Questions and the table
  Polar questions as the tip of the iceberg
• Lecture 1: Introducing questions and responses.
• Lecture 2: Representing question meanings.
• Lecture 3: The architecture of a QA system.
⇒ Lecture 4-5: The dynamics of responses.
• Lecture 5: wrap-up.
Some empirical desiderata
Reminder: the class of responses is large, and answers proper are only a small piece of the picture.
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Goal of Thursday/Friday: give a thorough linguistic account of the pragmatics of responding that derives some of this larger picture.

- **Update semantics with tables.** (Partly based on joint work with Justin Bledin, though he hasn’t seen this version.)
- We won’t include everything there is, but the account will be flexible, and could be added to.
Responses to assertions

(1)  A:  It’s raining.
    B:  I agree.
    B':  No it’s not, that’s snow.
    B'':  Are you sure?
    B''':  I think there’s a water leak on the top floor.
Responses to questions

(2)  A:  Is it raining?
    B:  Yes, it is. / No, it isn’t.
    B’: It might be.
    B’’: I don’t know.
    B’’’: I refuse to answer. / fuck you! / (shushing motion)
Responses to questions

(2) A: Is it raining?
B: Yes, it is. / No, it isn’t.
B’: It might be.
B’’: I don’t know.
B’’’: I refuse to answer. / fuck you! / (shushing motion)

(3) A: When’s the poster session today?
B: It’s at 8.
B’/A: Is it in the evening?
B’’: There’s no poster session today.
B’’’: It might be at 8.
B’’’’: I don’t know.
Stalnakerian context
A context set is a set of worlds. (Stalnaker 1978)

Contexts v. 1: A context is a tuple \(\langle H, cs \rangle\), where \(H\) is a non-empty set of agents and \(cs\) a context set.
(4) A context set is a set of worlds. (Stalnaker 1978)

(5) Contexts v. 1: A context is a tuple \(\langle H, cs \rangle\), where \(H\) is a non-empty set of agents and \(cs\) a context set.

(6) Where \(p\) is a proposition and \(cs\) a context set, \(cs \oplus p = cs \cap p\)

(7) Assertion v. 1: \(c + \text{Assert}_a(\phi) = \langle H_c, cs_c \oplus [\phi] \rangle\)

Felicity condition in \(w\): \(\forall w' \in \text{Dox}_w(a) : w' \in [\phi]\)

(‘\(a\) is committed to \(\phi\).’)
(4) A context set is a set of worlds. (Stalnaker 1978)

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Felicity condition in \( w \): \( \forall w' \in \text{Dox}_w(a) : w' \in \llbracket \phi \rrbracket \)

(‘\( a \) is committed to \( \phi \).’)

(8) Accommodating felicity inferences: by default, if a move comes with a felicity condition \( f \) relative to \( w \), as a precondition for interpreting that move in \( c \), we take it that \( cs_c \) entails \( f \).
A general felicity condition:

(9) A move \( \alpha_a \) where \( a \) is some agent is felicitous in a context \( c \) only if \( a \in H_c \).
Participation requirements

A general felicity condition:

(9) A move $\alpha_a$ where $a$ is some agent is felicitous in a context $c$ only if $a \in H_c$.

Some basic entrances and exits:

(10) $c + \text{Enter}(a) = \langle H_c \cup \{a\}, cs_c \rangle$ (can be accommodated)

(11) $c + \text{Exit}(a) = \langle H_c - \{a\}, cs_c \rangle$

Linguistic correlates? Leave this a question for now. (Cf. discussion in situated dialogue course.)
An example

The usual kind of thing: it’s raining in $w_1, w_2$ and not in $w_3, w_4$. 

$\llbracket \text{it's raining} \rrbracket = \{w_1, w_2\}$

(12) The scenario: a windowless room. A comes in from the outside. 

$c = \langle \{A, B\}, \{w_1, w_2, w_3, w_4\} \rangle$
The usual kind of thing: it’s raining in \( w_1, w_2 \) and not in \( w_3, w_4 \).

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A: It’s raining.

\[ c' = c + \text{Assert}_A(\neg \text{it’s raining}) \]
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c' = c + \text{Assert}_A(\overline{\text{it’s raining}})
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c' = \langle H_c, cS_c \oplus \{w_1, w_2\} \rangle
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Responding to assertions

(13) A: I’m not going to the party.
Responding to assertions

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  B: ok.
  B’: Yes you are.
Responding to assertions

(13)  A: I’m not going to the party.
  B: ok.
  B’: Yes you are.
  B’: (But) Joanna might be there. (Resistance move; Bledin & Rawlins 2016a,b)
  B’: What if Joanna is there?
(13) A: I’m not going to the party.
B: ok.
B’: Yes you are.
B’: (But) Joanna might be there. (Resistance move; Bledin & Rawlins 2016a,b)
B’: What if Joanna is there?
B’: are you sure?
B’: why not?
Stalnaker suggests that assertions can be rejected, but the usual approaches don’t provide a mechanism for this.

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- An assertion is a proposal to update the common ground with its content.
- In proposing, that assertion is put on the ‘table’.
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- An assertion is a proposal to update the common ground with its content.
- In proposing, that assertion is put on the ‘table’.

Intuition: if an assertion is on the table, interlocutors are coordinating on whether to incorporate it into the common ground.
A context is a tuple $\langle H, A, cs \rangle$, where $H$ is a non-empty set of agents, $A$ is a stack, and $cs$ a context set.
(14) **Tabular contexts v. 1**
A context is a tuple $\langle H, A, cs \rangle$, where $H$ is a non-empty set of agents, $A$ is a stack, and $cs$ a context set.

(15) **Tabular assertion**
$c + \text{Assert}_a(\phi) = \langle H_c, \text{push}(A_c, \phi), cs_c \rangle$
Felicity condition in $w$: $\forall w' \in \text{Dox}_w(a) : w' \in [\phi]$
('a is committed to $\phi$')
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(16) **Acceptance**
$c + \text{Accept}_a = \langle H_c, \text{pop}(A_c), cs_c \oplus [\text{pop}(A)] \rangle$
Felicity condition in $w$: $\forall w' \in \text{Dox}_w(a) : w' \in [\text{top}(A)]$

(17) **Rejection**
$c + \text{Reject}_a = \langle H_c, \text{pop}(A_c), cs_c \rangle$
Felicity condition in $w$: $\forall w' \in \text{Dox}_w(a) : w' \not\in [\text{top}(A)]$
Example: acceptance of assertions

it’s raining in $w_1, w_2$ and not in $w_3, w_4$. $[[\text{it’s raining}]] = \{w_1, w_2\}$

(18) The scenario: a windowless room. A comes in from the outside.

$c_0 = \langle\{a, b\}, \langle\rangle, \{w_1, w_2, w_3, w_4\}\rangle$
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a: It’s raining.

\[c_1 = c_0 + \text{Assert}_a(\neg \text{it’s raining})\]

\[c_1 = \langle H_{c_0}, \langle \neg \text{it’s raining} \rangle, cs_{c_0} \rangle\]
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b: Ok.

\[c_2 = c_1 + \text{Accept}_b\]
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\[c_1 = c_0 + \text{Assert}_a(\lnot \text{it’s raining})\]

\[c_1 = \langle H_{c_0}, \langle \lnot \text{it’s raining} \rangle, cs_{c_0} \rangle\]

b: Ok.

\[c_2 = c_1 + \text{Accept}_b\]

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\[ c_1 = c_0 + \text{Assert}_a(\neg \text{it’s raining}) \]

\[ c_1 = \langle H_{c_0}, \langle\neg \text{it’s raining}\rangle, c_{s_{c_0}}\rangle \]

b: Ok.

\[ c_2 = c_1 + \text{Accept}_b \]

\[ c_2 = \langle H_{c}, \text{pop}(A_{c_1}), c_{s_{c}} \oplus \text{top}(A_{c_1})\rangle \]

\[ c_2 = \langle H_{c}, \langle\rangle, c_{s_{c}} \oplus \{w_1, w_2\}\rangle \]

\[ c_2 = \langle\{a, b\}, \langle\rangle, \{w_1, w_2\}\rangle \]

For assertions, acceptance is the default! \( c + \text{Assert}(\phi) + \text{Accept} \) amounts to assertion in v. 1.
Non-acceptance moves

- Rejection is contextually straightforward. But it results in a situation where it is public knowledge that speaker’s belief states conflict, without further resolution.

- Resistance is more complicated. Bledin & Rawlins (2016): involves drawing attention to possibilities that are previously ignored. (Need a model of attention; de Jager 2009, Fritz & Lederman 2015)

- Resistance involves, at some level, a strategy of inquiry for deciding whether to accept an assertion.

- Initial assertion remains on table while resistance move is dealt with.

- Assertion sequences (without acceptance) are mostly unconstrained so far. One more interesting case: sequences of contradictory assertions.
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  - Initial assertion remains on table while resistance move is dealt with.
- Assertion sequences (without acceptance) are mostly unconstrained so far. One more interesting case: sequences of contradictory assertions.
A Stalnakerian account for questioning
So far, we have only a single kind of inquiry: coordinating on a specific assertion.

- How can this be generalized?
- Starting point: modify the original Stalnakerian approach, and then return to a tabular approach.
We need a representation that can handle both information and issues.

• Information: what worlds are present at all.
• Issues: how do the worlds that are present relate to each other?

Groenendijk’s 1999 idea: an equivalence relation on a subset of \( W \) accomplishes this. (This leads to the notion of a hybrid in later work.)
A pre-formalizing example

Our usual four worlds. It’s raining (only) in $w_1, w_2$ and snowing (only) in $w_4$.

\[ c + \text{“is it raining?”} = \{ \langle w_1, w_1 \rangle, \langle w_1, w_2 \rangle, \langle w_2, w_1 \rangle, \langle w_2, w_2 \rangle, \langle w_3, w_3 \rangle, \langle w_3, w_4 \rangle, \langle w_4, w_3 \rangle, \langle w_4, w_4 \rangle \} \]
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Our usual four worlds. It’s raining (only) in \( w_1, w_2 \) and snowing (only) in \( w_4 \).

(19) \[ c + \langle \text{is it raining?} \rangle = \]

\[
\begin{array}{c}
\langle w_1, w_1 \rangle, \quad \langle w_1, w_2 \rangle, \\
\langle w_2, w_1 \rangle, \quad \langle w_2, w_2 \rangle, \\
\langle w_3, w_3 \rangle, \quad \langle w_3, w_4 \rangle, \\
\langle w_4, w_3 \rangle, \quad \langle w_4, w_4 \rangle
\end{array}
\]

Intuition: cells correspond to ways the (informative) context set could evolve.
Another pre-formalizing example

(20) \[ c + \neg \text{It’s not snowing, but is it raining?} \neg = \]
\[
\{ \langle w_1, w_1 \rangle, \langle w_1, w_2 \rangle, \langle w_2, w_1 \rangle, \langle w_2, w_2 \rangle, \langle w_3, w_3 \rangle, \}
\]

Full update has eliminated one world altogether (w₄) and divided up w₁, w₂ from w₄.

(21) A **G-context set** is a set of pairs of worlds in some $cs \subseteq \mathcal{W}$ that is reflexive, symmetric, and transitive. (An equivalence relation.)

(22) **Contexts v. 2**: A context is a tuple $\langle H, cs \rangle$, where $H$ is a non-empty set of agents and $cs$ a G-context set.
Inquiry in a Stalnakerian context: setup

Some convenience functions:

(23) Where $Q$ is an equivalence relation:

a. $\text{Dom}(Q) = \{w \mid \langle w, w \rangle \in Q\}$

b. $\text{Alts}(Q) = \{p_{\langle st \rangle} \mid p \neq \emptyset \land \exists u_S : \forall v_S : \langle u, v \rangle \in Q \leftrightarrow p(v)\}$

c. A proposition $p$ resolves an equivalence relation $Q$ iff $\exists p' \in \text{Alts}(Q) : p \subseteq p'$.¹

¹This is different that a Roberts-style complete answer.
Inquiry in a Stalnakerian context: setup

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c. A proposition \(p\) resolves an equivalence relation \(Q\) iff \(\exists p' \in \text{Alts}(Q) : p \subseteq p'.\)

Example: \(\{w_1\}\) resolves \(\{\langle w_1, w_1 \rangle, \langle w_1, w_2 \rangle, \langle w_2, w_1 \rangle, \langle w_2, w_2 \rangle, \langle w_3, w_3 \rangle\}\)

\(^1\)This is different that a Roberts-style complete answer.
On to defining the moves. First, redefine ⊕, ⊖ (here cf. Isaacs & Rawlins 2008).

(24) Where $p$ is a proposition and $c$ a context,  
\[ c \oplus p = c \cap \{ \langle w,v \rangle | w,v \in p \} \]

(25) Where $p$ is a proposition and $c$ a context,  
\[ c \ominus p = c \cap \{ \langle w,v \rangle | w \in p \leftrightarrow v \in p \} \]
Inquiry in a Stalnakerian context: moves

On to defining the moves. First, redefine $\oplus$, $\ominus$ (here cf. Isaacs & Rawlins 2008).

(24)  Where $p$ is a proposition and $c$ a context,
$c \oplus p = c \cap \{\langle w, v \rangle \mid w, v \in p\}$

(25)  Where $p$ is a proposition and $c$ a context,
$c \ominus p = c \cap \{\langle w, v \rangle \mid w \in p \leftrightarrow v \in p\}$

(26)  Assertion v. 2: $c + \text{Assert}_a \phi = \langle H_c, cs_c \oplus [\phi] \rangle$
Felicity conditions: the same ($a$ is committed to $\phi$)

(27)  Polar questions v. 1: $c' = c + \text{PolarQ}_a \phi = \langle H_c, cs_c \ominus [\phi] \rangle$
Felicity conditions in $w$: It is not the case that
$\text{Dox}_a(w) \cap \text{Dom}(cs_{c'})$ resolves $cs_{c'}$. 
A post-formalization example 1

Initial context

\[ c_0 = \langle \{A, B\}, \{ \langle w_1, w_1 \rangle, \langle w_1, w_2 \rangle, \langle w_1, w_3 \rangle, \langle w_1, w_4 \rangle, \langle w_2, w_1 \rangle, \langle w_2, w_2 \rangle, \langle w_2, w_3 \rangle, \langle w_2, w_4 \rangle, \langle w_3, w_1 \rangle, \langle w_3, w_2 \rangle, \langle w_3, w_3 \rangle, \langle w_3, w_4 \rangle, \langle w_4, w_1 \rangle, \langle w_4, w_2 \rangle, \langle w_4, w_3 \rangle, \langle w_4, w_4 \rangle \} \rangle \]

Facts: it’s raining (only) in \( w_1, w_2 \) and snowing (only) in \( w_4 \).
A post-formalization example 2

Is it raining?

\[ c_1 = \langle \{A, B\}, \{ \langle w_1, w_1 \rangle, \langle w_1, w_2 \rangle, \langle w_1, w_3 \rangle, \langle w_1, w_4 \rangle, \langle w_2, w_1 \rangle, \langle w_2, w_2 \rangle, \langle w_2, w_3 \rangle, \langle w_2, w_4 \rangle, \langle w_3, w_1 \rangle, \langle w_3, w_2 \rangle, \langle w_3, w_3 \rangle, \langle w_3, w_4 \rangle, \langle w_4, w_1 \rangle, \langle w_4, w_2 \rangle, \langle w_4, w_3 \rangle, \langle w_4, w_4 \rangle \} \rangle \]

\[ c_1 = c_0 + [\text{is it raining?}] = \langle H_c, cS_c \odot [\text{it is raining}] \rangle \]
A post-formalization example 3

A: Is it raining?

\[ c_1 = \langle \{A, B\}, \begin{cases} \langle w_1, w_1 \rangle, & \langle w_1, w_2 \rangle, \\ \langle w_2, w_1 \rangle, & \langle w_2, w_2 \rangle, \\ \langle w_3, w_3 \rangle, & \langle w_3, w_4 \rangle, \\ \langle w_4, w_3 \rangle, & \langle w_4, w_4 \rangle \end{cases} \rangle \]

\[ c_1 = c_0 + \langle \text{is it raining?} \rangle = \langle H_c, c_{s_c} \otimes [\text{it is raining}] \rangle \]
B: Yes, it’s raining.

\[ c_1 = \langle \{A, B\}, \{ \langle w_1, w_1 \rangle, \langle w_1, w_2 \rangle, \langle w_2, w_1 \rangle, \langle w_2, w_2 \rangle \} \rangle \]

\[ c_2 = c_1 + \llbracket \text{It’s raining} \rrbracket = \langle H_{c_1}, c_{S_{c_1}} \oplus \llbracket \text{it is raining} \rrbracket \rangle \]
A post-formalization example 4

B: Yes, it’s raining.

\[ c_1 = \langle \{A, B\}, \begin{cases} \langle w_1, w_1\rangle, & \langle w_1, w_2\rangle, \\ \langle w_2, w_1\rangle, & \langle w_2, w_2\rangle \end{cases} \rangle \]

\[ c_2 = c_1 + \Box \text{It’s raining} = \langle H_{c_1}, cs_{c_1} \oplus [\text{it is raining}] \rangle \]

- The context is now uninquisitive.
A post-formalization example 4

<table>
<thead>
<tr>
<th>B: Yes, it’s raining.</th>
</tr>
</thead>
<tbody>
<tr>
<td>$c_1 = \langle {A, B}, { \langle w_1, w_1 \rangle, \langle w_1, w_2 \rangle, \langle w_2, w_1 \rangle, \langle w_2, w_2 \rangle } \rangle$</td>
</tr>
</tbody>
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$c_2 = c_1 + \overline{\text{It's raining}} = \langle H_{c_1}, cs_{c_1} \oplus [\text{it is raining}] \rangle$

- The context is now uninquisitive.
- Relevance constraint after Roberts:

(28) A question-response $\alpha$ is relevant in a G-context $c$ just in case there is some $p \in \text{Alts}(cs_c)$ such that $[\alpha]$ decides $p$ or $[\alpha]$ decides $\neg p$. 
Moving to non-polar questions

How to get from polar to constituent questions? (Here I diverge quite a bit from Groenendijk.)

- Intuition: can get the effect of a constituent question with a set of polar questions of this type.
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• Intuition: can get the effect of a constituent question with a set of polar questions of this type.

• ‘What is the weather like?’ ~ ‘is it raining?’ + ‘is it sunny?’ + ‘is it snowing’?

• Suppose that a question denotation in general is a Hamblin alternative set (assume mutual exclusivity and exhaustivity).
This generalizes the starting analysis of polar questions as long as polar questions denote singleton sets.
Inquiry in a Stalnakerian context with Hamblin alternatives

Restrict to alternative sets that partition some subset of $\mathcal{W}$ (no overlap).

(29) Where $Q$ is an alternative set and $c$ a context,
$$c \oplus p = c \cap \{\langle w, v \rangle \mid \forall p \in Q : w \in p \leftrightarrow v \in p\}$$

(30) Questions v. 2.1
$$c' = c + \text{Question}_a \phi = \langle H_c, \cap \{cs_c \odot p \mid p \in [\phi]\} \rangle$$

Felicity conditions in $w$: It is not the case that $\text{Dox}_a(w) \cap \text{Dom}(cs_{c'})$ resolves $cs_{c'}$. 
Suppose it’s raining in $w_1, w_2$, sunny in $w_3$ and snowing in $w_4$.

What’s the weather like? $[\text{What’s the weather like?}] = \{\{w_1, w_2\}, \{w_3\}, \{w_4\}\}$.

$\cap \{c_{s_c} \odot p \mid p \in [\text{what’s the weather like}]\} =$

\[
\begin{align*}
\{ \langle w_1, w_1 \rangle, & \langle w_1, w_2 \rangle, \\
\langle w_2, w_1 \rangle, & \langle w_2, w_2 \rangle, \\
\{ \langle w_3, w_3 \rangle, & \langle w_3, w_4 \rangle, \\
\langle w_4, w_3 \rangle, & \langle w_4, w_4 \rangle \} \cap \{ \langle w_1, w_1 \rangle, & \langle w_1, w_2 \rangle, \\
\langle w_2, w_1 \rangle, & \langle w_2, w_2 \rangle, \\
\{ \langle w_3, w_3 \rangle, & \langle w_4, w_3 \rangle, \\
\langle w_4, w_1 \rangle, & \langle w_4, w_2 \rangle, \\
\{ \langle w_1, w_4 \rangle, & \langle w_2, w_4 \rangle, \\
\langle w_3, w_3 \rangle, & \langle w_4, w_4 \rangle \} \cap \{ \langle w_1, w_1 \rangle, & \langle w_1, w_2 \rangle, \\
\langle w_2, w_1 \rangle, & \langle w_2, w_2 \rangle, \\
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\langle w_3, w_3 \rangle, & \langle w_4, w_4 \rangle \} \end{align*}
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\langle w_1, w_1 \rangle, & \langle w_1, w_2 \rangle, \\
\langle w_2, w_1 \rangle, & \langle w_2, w_2 \rangle, \\
\langle w_3, w_3 \rangle, & \\
\langle w_4, w_4 \rangle & 
\end{cases}
\]
Questions and the table
Can simply add an assertion stack to the G-context structure. Is this enough?
Integrating tables

How to incorporate tables into this picture?

- **assertions**: coordinating on evolution of the common ground.
  - Interaction with content: acceptance.
  - **Common ground management** (Repp 2013): rejection, postponement (others).
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  - Interaction with content: acceptance.
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  - Interaction with content: (partially) resolve.
  - Common ground management? reject question, start subinquiry, clarify, ...
(31) **Contexts v. 3**
A context is a tuple $\langle H, Q, A, cs \rangle$, where $H$ is a non-empty set of agents, $Q$ and $A$ are stacks of sentences, and $cs$ is a (regular) context set.

(32) **Tabular assertion v. 2** (additional felicity conditions to be filled in)
$c + \text{Assert}_a(\phi) = \langle H_c, \text{push}(A_c, \phi), Q_c, cs_c \rangle$
Felicity condition in $w$: $\forall w' \in \text{Dox}_w(a) : w' \in [\phi]$
(‘$a$ is committed to $\phi$’)

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('a is committed to $\phi$.')

(33) **Acceptance v. 2**
$c + \text{Accept}_a = \langle H_c, \text{pop}(A_c), Q_c, cs_c \oplus \llbracket \text{pop}(A) \rrbracket \rangle$
Felicity condition in $w$: $\forall w' \in Dox_w(a): w' \in \llbracket \text{pop}(A) \rrbracket$
Where $p$ is a proposition, $inq(p) = \{\langle w, v \rangle \mid w, v \in p\}$

The $i$: where $c$ is a context,

$$QUD(c) = \begin{cases} 
\bigcap \{inq(cs_c) \cap p \mid p \in [\top(Q_c)]\} & \text{if } |Q_c| \geq 1 \\
inq(cs_c) & \text{otherwise}
\end{cases}$$

Dispelling a question: where $c$ is a context,

$c + \text{Dispel} = \langle H_c, A_c, \text{pop}(Q_c), cs_c \rangle$ Felicitous only if $|Q_c| \geq 1$

The full QUD in a context: where $c$ is a context,

$$FQUD(c) = \begin{cases} 
inq(cs_c) & \text{if } |Q_c| = 0 \\
QUD(c) \cap FQUD(c + \text{Dispel}) & \text{otherwise}
\end{cases}$$
Questions with the table

$$c' = c + \text{Question}_a(\phi) = \langle H_c, \text{push}(Q_c, \phi), A_c, cs_c \rangle$$

Felicity conditions: appropriate in $c$ at $w$ only if

(i) If $|Q_c| \geq 1$ then $FQU_D(c) \subseteq QUD(c')$, and

(ii) It is not the case that $Dox_a(w) \cap cs_{c'}$ resolves $QUD(c')$.

Automatic dispelling

At any point $c_n$ in a conversation, if $QUD(c_n) = \text{inq}(cs_{c_n})$, adjust $c_n$ to $c'_n = c_n + \text{Dispel}$. 
Relevance again:

(40) A question-response $\alpha$ is relevant in a table context $c$ just in case $\text{Alts}(QUD(c + \llbracket \alpha \rrbracket)) \subseteq \text{Alts}(QUD(c))^2$

$^2$This is still different from Roberts-style relevance.
Current analysis of the semantics of polar questions is a departure from Hamblin:

(41) \( [[\text{Is it raining?}]] = \lambda w . \text{it’s raining in } w \)

How to think about question-question sequences?

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How to think about question-question sequences?

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In the G-context system, this would involve a redundant update. But this seems felicitous!

These are already licensed in the current system.
Licensing question-question sequences. Where $c$ is the initial context:

$$QUD(c + \text{What's the weather like?}) =$$

$$\begin{cases} 
<w_1, w_1>, & <w_1, w_2>, \\
<w_2, w_1>, & <w_2, w_2>, \\
&w_3, w_3>, \\
&w_4, w_4>
\end{cases}$$

is a subset of

$$QUD(c + \text{What's the weather like?} + \text{Is it raining?}) =$$

$$\begin{cases} 
<w_1, w_1>, & <w_1, w_2>, \\
<w_2, w_1>, & <w_2, w_2>, \\
&w_3, w_3>, & <w_3, w_4>, \\
&w_4, w_3>, & <w_4, w_4>
\end{cases}$$
(43) Where should we go for lunch? Should we go to Mamoun’s?

Biezma & Rawlins (2012): the function of a polar question relative to a bigger QUD is to characterize an alternative by ‘name’ – identify constraint on the domain.

• The felicity condition acts as an informative presupposition (Prince 1978, Stalnaker 1973, 1974, a.o.)
Polar questions again (3)

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- The felicity condition acts as an informative presupposition (Prince 1978, Stalnaker 1973, 1974, a.o.)
- Biezma & Rawlins (2012) suggest that polar questions can never establish a big question. Stronger than the present constraint: could implement by adding a polar-specific presupposition (content alternative is part of the input QUD).
Similar puzzle arises for alternative questions. On a naive implementation in a G-context system, they would involve redundant updates:

(44) Where should we go for lunch? Should we go to Mamoun’s or to Tacoria? (falling pitch)
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Biezma & Rawlins (2012) proposal – alternative questions list by ‘name’ all of the propositions in the current QUD. Implicate falling pitch in this (though this is controversial; see ?). Sketch:

(45) Where $\alpha$ is a disjunction structure, $[[\alpha + \text{falling pitch}]]^c = [[\alpha]]^c$

Presupposes: $QUD(c) = QUD(c + [[\alpha]]^c)$
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(45) Where \( \alpha \) is a disjunction structure, \( \llbracket \alpha + \text{falling pitch} \rrbracket^c = \llbracket \alpha \rrbracket^c \)

Presupposes: \( QUD(c) = QUD(c + \llbracket \alpha \rrbracket^c) \)

• This may force accommodation that eliminates alternatives that are in principle viable in \( c \).
Summary

What have we accomplished?

- Core answers. (Fairly standard machinery in an update semantics context.)
- Basics of rejections / dismissals for assertions and questions.
- Room for resistance, strategies for acceptance – but not the full story.
- Question-question sequences and subquestions.

What’s still missing?

- Weak answers (possibility claims, ignorance claims).
- Presupposition denials.
- A fuller story for resistance. (Probably not this class.)


Farkas, Donka & Kim Bruce. 2010. On reacting to assertions and polar questions. *Journal of Semantics* 27. 81–118.

Fritz, Peter & Harvey Lederman. 2015. Standard state space models of unawareness. manuscript.


