Isaacs and Rawlins on Conditional Questions

Is Denial of the Antecedent An Answer?

William Starr

10.21.08

Outline

Conditional Questions

The Question

(1) a. If Alle dances, will Bill dance?
b. Yes
c. No
d. Alle won't dance

The Questions

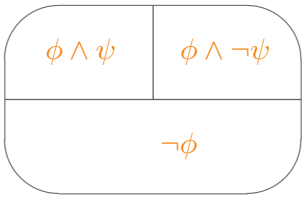
- Is (1d) a semantic answer of some sort?
- What exactly do the positive & negative answers mean?

The Players

- Hulstijn, Velissaratou, Groenendijk: *yes*
- Isaacs & Rawlins: *no*

Tripartitions

Hulstijn



- Let $?\psi$ be a polar question
- $\phi \rightarrow ?\psi$ generates a tripartition
- First, divide the ϕ and $\neg\phi$ worlds
- Then, among the ϕ worlds, divide the ψ and $\neg\psi$ worlds

- Complete answers: $\neg\phi$ $\phi \wedge \psi$ $\phi \wedge \neg\psi$

Prediction:

(1) a. If Alle dances, will Bill dance?
b. Yes (= Alle will dance and Bill will dance)
c. No (= Alle will dance and Bill won't dance)
d. Alle won't dance

Against Tripartitions

Isaacs & Rawlins on Tripartitions

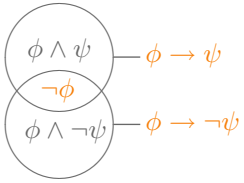
Tripartition Prediction

(1)
a. If Alle dances, will Bill dance?
b. Yes (= Alle will dance and Bill will dance)
c. No (= Alle will dance and Bill won't dance)
d. Alle won't dance

- Strongest criticism: (1b) and (1c) seem to strong
- Answering *Yes* to a conditional question does not intuitively commit me to the truth of the antecedent
- Neither does *No*
- I&R offer others, but they less clearly target the core of the tripartition approach

Dropping Mutual Exclusivity

Groenendijk, Mascarenhas & Velissaratou



- Questions denote a set of exhaustive alternatives, which may not be mutually exclusive
- Each alternative is an answer
- With $\phi \rightarrow ?\psi$ alternatives **do** overlap
- Asserting $\neg\phi$ eliminates worlds where the alternatives differ, so it dispels the question

Non-Exclusive Prediction

(1)
a. If Alle dances, will Bill dance?
b. Yes (= If Alle dances, Bill will dance)
c. No (= If Alle dances, Bill won't dance)
d. Alle won't dance (Consequent question is dispelled)

Against Dropping Mutual Exclusivity

Isaacs & Rawlins on Subjunctive Conditional Questions

(2)
a. If Jo could have fixed the car, would you have kept on using it?
b. Jo couldn't have fixed the car
c. Jo could have fixed the car (I&R:280)

- Unlike in (1), the denial of the antecedent (2b) does not dispel the issue raised in the consequent
- Yet, in (2c), the assertion of the antecedent does dispel the issue

Against Dropping Mutual Exclusivity

Isaacs & Rawlins on Subjunctive Conditional Questions

(2)
a. If Jo could have fixed the car, would you have kept on using it?
b. Jo couldn't have fixed the car (Issue not dispelled)
c. Jo could have fixed the car (Issue dispelled) (I&R:280)

- (2c) requires the alternatives to overlap on all ϕ-worlds
- But these are the worlds that need to be 'split up' by the consequent question!
- If this is right, the overlapping alternatives approach is in trouble

Against Dropping Mutual Exclusivity

Isaacs & Rawlins on The Meaning of *Yes* & *No*

Non-Exclusive Prediction

(1) a. If Alle dances, will Bill dance?
b. Yes (= If Alle dances, Bill will dance)
c. No (= If Alle dances, Bill won't dance)
d. Alle won't dance (Consequent question is dispelled)

- How do the meanings of *yes* & *no* come out as conditional?
- Evidently, *yes* picks up one alternative, which happens to be a conditional alternative, and *no* picks up the other alternative

Against Dropping Mutual Exclusivity

Isaacs & Rawlins on The Meaning of *Yes* & *No*

(3) a. If Alfonso comes, will Joanna be mad?
b. Yes, she will
c. Yes, if he comes, she will be mad

I&R's Challenge (§3.2.3)

- "If what *yes* means is the same thing as response [(3c)], then it is not clear why the continuation [(3b)], without the *if*-clause, should be possible" (p.282)

A Response

- *Yes* always picks out the $\phi \rightarrow \psi$ alternative
- There are two ways of specifying that alternative
  - With a modally subordinated & anaphoric *will*: (3b)
  - With a conditional that makes explicit what the first builds in with modal anaphora: (3c)

Denial of the Antecedent

Co-varies with Presupposition Denial

I&R's Claim

Denying or asserting the antecedent of a CQ is felicitous and issue dispelling iff it rejects the conditional's presupposition

(4) If Alle danced, Bill danced

(5) If Alle could have danced, Bill would have danced

Their Premises

- (4) presupposes that the antecedent is possible
  - Denying the antecedent of the CQ version of (4) **is** felicitous, and rejects presupposition

Denial of the Antecedent

Co-varies with Presupposition Denial

I&R's Claim

Denying or asserting the antecedent of a CQ is felicitous and issue dispelling iff it rejects the conditional's presupposition

(4) If Alle danced, Bill danced

(5) If Alle could have danced, Bill would have danced

Their Premises

- (5) presupposes that the antecedent is impossible
  - Denying the antecedent of the CQ version of (5) **is not** felicitous, but doesn't reject presupposition
  - Asserting the antecedent of the CQ version of (5) rejects presupposition & dispels issue

Presupposition Denial
It's Discourse Effects

- I&R take their claim to suggest that denial of the antecedent responses are actually instances of presupposition denial
- The discourse effect of dispelling issues is due to the fact that presupposition denial requires 'rewinding' the context to an earlier state
- This 'nullifies' any assertions or questions that depended on the presupposition
- However, this whole process is purely pragmatic, although the semantics and formalism should be capable of being integrated with this kind of description

Some Reservations
Presupposition

- Not all counterfactual conditionals presuppose the impossibility of their antecedent (Anderson, Peters):

(6) X: Kennedy was shot by a lone gunman
Y: Kennedy was shot by two gunmen
Z: Look, if two gunmen had shot Kennedy, then two guns would have been found. So, let's find out how many guns were in fact found.
Z′: Look, if two gunmen shot Kennedy, then two guns must have been found. So, let's find out how many guns were in fact found.

- This significantly complicates things for I&R

The Basics
A Simple Logic

- Ordinary propositional logic w/$\neg$ and $\wedge$ as primitive
- Add three new bits:
  1. A question operator: ?
  2. An assertion operator: $\triangle$
  3. A conditional operator: $(\text{if } \cdot)(\cdot)$
- Formulas are assigned truth-values relative to a world and a context
- Contexts are equivalence relations on Ω:
  - If $\langle w, w' \rangle \in c$, then w, w' are candidate actual worlds
  - If $\langle w, w' \rangle \in c$, then w & w' give identical answers to open issues

The Basics
Context Update

- **D4.1** describes how declaratives update context
  - Keep a pair iff ϕ is true in both worlds
- **D4.2** describes how questions update context
  - Keep a pair iff ϕ has the same truth value in each of the worlds
- Since c is an equivalence relation, D4.2 has the effect of inducing a partition
  - A polar question $?\phi$, divides c into the worlds that make ϕ false and the worlds that make ϕ true

The Basics

Macro-Contexts: What They Are

- But, contexts aren't enough for I&R
- They also need macro-contexts
- These are defined in **D3.2**
- They are tuples that store multiple contexts
- The top context is the one for current discourse

The Basics

Macro-Contexts: How They're Used

- Conditionals & modal subordination generate new contexts
  - See **D5.4**
- Consequents/modal elaborations refine these contexts
  - See **D5.5**
- But, what happens in these contexts doesn't always stay in these contexts
  - If the consequent of a conditional is an assertion, information will percolate to lower contexts
  - See **D5.2**

The Basics

Macro-Contexts: How They're Used

- Once modal elaboration ceases, derived contexts are discarded
  - We return to the next lowest context
- I&R's idea about antecedent denial:
  - It signals that elaboration has ceased, since it is incompatible with the current derived context
  - So we return to the pre-conditional question context
  - Thus, we need not address the consequent question
- Real answers continue the elaboration and are interpreted in the derived context
  - This saves mutual exclusivity

Percolation

Intuitively

- $\vdash (c, c', c' \oplus \phi)$ is: the information compatible with learning in c that c' has been updated with ϕ
- Intuitively, these are the possibilities that:
  - Are in c but have been supposed 'out of the way' in c'
  - Are in both c and $c' \oplus \phi$
- That is: $(c - c') \cup (c \cap c'')$
- But, recall that contexts are pairs of worlds, so we must define '$-$' with care

Percolation

An Example

Fact 1.1 $\vdash (\Omega^2, c_{\mathsf{a}}, c_{\mathsf{a}} \oplus \mathsf{b}) = c_1$

$$= \left\{ \begin{array}{ll} 00,00 & 00,01 \\ 01,00 & 01,01 \\ 11,11 & \end{array} \right\}$$

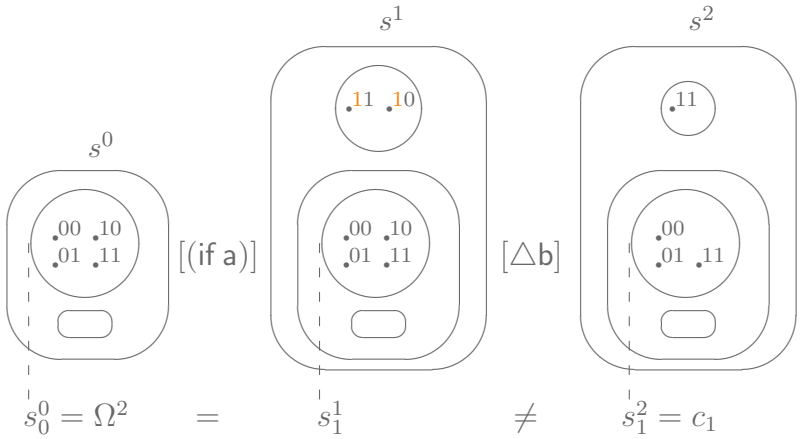
How do you find c_1? (Use D5.1!)

- Look at each $\langle w, w' \rangle \in \Omega^2$, evaluate 2 conditionals:
  a. If $\forall z \in \Omega$: $\langle w, z \rangle \notin c_{\mathsf{a}}$ & $\langle z, w' \rangle \notin c_{\mathsf{a}}$, $\langle w, w' \rangle \in c_1$
  b. If $\langle w, w' \rangle \in c_{\mathsf{a}} \oplus \mathsf{b}$, then $\langle w, w' \rangle \in c_1$

  Otherwise, $\langle w, w' \rangle \notin c_1$

A Conditional Assertion

Graphically



Note: Ovals are macro-contexts, circles are contexts
Contexts are represented as the set of worlds in at least one of its pairs

A Conditional

Running Through the Definitions

If Alle dances, Bill dances $\rightsquigarrow ((\mathsf{if\ a})\, \triangle \mathsf{b})$

$$\begin{aligned}
s^0[((\mathsf{if\ a})\, \triangle \mathsf{b})] &= s^0[(\mathsf{if\ a})][\triangle \mathsf{b}] && \text{(D5.5)} \\
&= \textsc{push}(s^0, s_0^0 \oplus \mathsf{a})[\triangle \mathsf{b}] && \text{(D5.4)} \\
&= \textsc{push}(s^0, \Omega^2 \oplus \mathsf{a})[\triangle \mathsf{b}] && \text{(D3.2d)} \\
&= \textsc{push}(s^0, c_{\mathsf{a}})[\triangle \mathsf{b}] && \text{(D6}c_{\mathsf{a}}\text{)} \\
&= \underbrace{\langle c_{\mathsf{a}}, s^0 \rangle}_{s^1}[\triangle \mathsf{b}] && \text{(D3.3)} \\
&= \langle \vdash (s_0^1, s_0^1, s_0^1 \oplus \mathsf{b}), \langle \vdash (s_1^1, s_0^1, s_0^1 \oplus \mathsf{b}), \langle\rangle \rangle \rangle && \text{(D5.2)} \\
&= \langle \vdash (c_{\mathsf{a}}, c_{\mathsf{a}}, c_{\mathsf{a}} \oplus \mathsf{b}), \langle \vdash (\Omega^2, c_{\mathsf{a}}, c_{\mathsf{a}} \oplus \mathsf{b}), \langle\rangle \rangle \rangle && (s_0^1 = c_{\mathsf{a}}, s_1^1 = \Omega^2) \\
&= \langle \{(11,11)\}, \langle \vdash (\Omega^2, c_{\mathsf{a}}, c_{\mathsf{a}} \oplus \mathsf{b}), \langle\rangle \rangle \rangle && \text{(D5.1)} \\
&= \langle \{(11,11)\}, \langle c_1, \langle\rangle \rangle \rangle && \text{(\textbf{Fact 1.1})} \\
&=: s^2
\end{aligned}$$

A Conditional Question

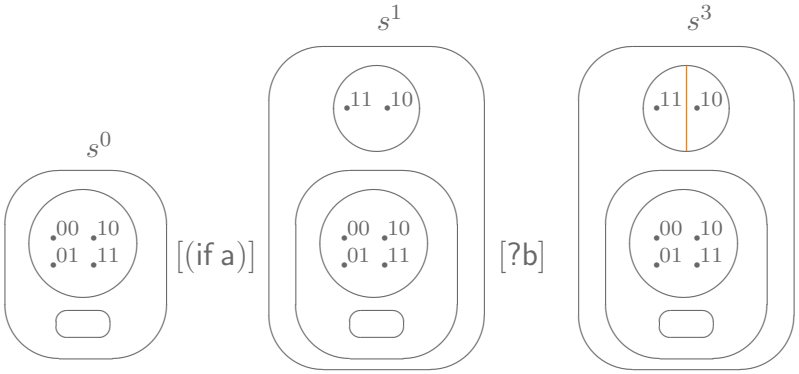
Running Through the Definitions

If Alle dances, will Bill dance? $\rightsquigarrow ((\mathsf{if\ a})\, ?\mathsf{b})$

$$\begin{aligned}
s^0[((\mathsf{if\ a})\, ?\mathsf{b})] &= s^0[(\mathsf{if\ a})][?\mathsf{b}] && \text{(D5.5)} \\
&= \langle c_{\mathsf{a}}, s^0 \rangle [?\mathsf{b}] && \text{(\textbf{Prev. Ex.})} \\
&= \langle c_{\mathsf{a}} \oslash \mathsf{b}, s^0 \rangle && \text{(D5.3)} \\
&= \langle \{(10,10), (11,11)\}, s^0 \rangle && \text{(D4.2)} \\
&=: s^3
\end{aligned}$$

A Conditional Question

In Pictures



Note: Ovals are macro-contexts, circles are contexts
Contexts are represented as the set of worlds in at least one of its pairs

Answering A Conditional Question

The First Way

(1) a. If Alle dances, will Bill dance?
b. Yes
c. No
d. Alle won't dance

$$\begin{aligned}
s^0[(1a')][(1b')] &= s^3[\triangle \mathsf{b}] \\
&= \langle\{(10,10),(11,11)\},\langle\Omega^2,\langle\rangle\rangle\rangle[\triangle \mathsf{b}] && (\text{D6}.s^3, s^0) \\
&= \langle\vdash(s_0^3, s_0^3, s_0^3 \oplus \mathsf{b}), \langle\vdash(s_1^3, s_0^3, s_0^3 \oplus \mathsf{b}), \langle\rangle\rangle\rangle && (\text{D5.2}) \\
&= \langle\{(11,11)\},\langle\vdash(\Omega^2, s_0^3, \{(11,11)\}),\langle\rangle\rangle\rangle && (\text{D5.1, D6}.s^3) \\
&= \langle\{(11,11)\},\langle c_1,\langle\rangle\rangle\rangle && (\text{D5.1, D6}.s^3) \\
&= s^2 && (\text{D6}.s^2) \\
&= s^0[(\mathsf{if\ a})\triangle \mathsf{b}]
\end{aligned}$$

Answering A Conditional Question

The Second Way

(1) a. If Alle dances, will Bill dance?
b. Yes
c. No
d. Alle won't dance

$$\begin{aligned}
s^0[(1a')][(1c')] &= s^3[\triangle \neg \mathsf{b}] \\
&= \langle\{(10,10),(11,11)\},\langle\Omega^2,\langle\rangle\rangle\rangle[\triangle \neg \mathsf{b}] && (\text{D6}.s^3, s^0) \\
&= \langle\vdash(s_0^3, s_0^3, s_0^3 \oplus \neg \mathsf{b}), \langle\vdash(s_1^3, s_0^3, s_0^3 \oplus \neg \mathsf{b}), \langle\rangle\rangle\rangle && (\text{D5.2}) \\
&= \langle\{(10,10)\},\langle\vdash(\Omega^2, s_0^3, \{(10,10)\}),\langle\rangle\rangle\rangle && (\text{D5.1, D6}.s^3) \\
&= \langle\{(10,10)\},\langle c_2,\langle\rangle\rangle\rangle && (\text{D5.1, D6}.s^3)
\end{aligned}$$

$$c_2 := \left\{ \begin{array}{lll} 00,00 & 00,01 & \\ 01,00 & 01,01 & 10,10 \end{array} \right\}$$

Responding to A Conditional Question

The Third Way

(1) a. If Alle dances, will Bill dance?
b. Yes
c. No
d. Alle won't dance

$$\begin{aligned}
s^0[(1a')][(1d')] &= s^3[\triangle \neg \mathsf{a}] \\
&= \langle\{(10,10),(11,11)\},\langle\Omega^2,\langle\rangle\rangle\rangle[\triangle \neg \mathsf{a}] && (\text{D6}.s^3, s^0) \\
&= \langle\vdash(s_0^3, s_0^3, s_0^3 \oplus \neg \mathsf{a}), \langle\vdash(s_1^3, s_0^3, s_0^3 \oplus \neg \mathsf{a}), \langle\rangle\rangle\rangle && (\text{D5.2}) \\
&= \langle\varnothing,\langle\vdash(\Omega^2, s_0^3, \varnothing),\langle\rangle\rangle\rangle && (\text{D5.1, D6}.s^3) \\
&= \langle\vdash(\Omega^2, s_0^3, \varnothing),\langle\rangle\rangle && (\text{Pragmatic Pop}) \\
&= \left\langle \left\{ \begin{array}{ll} 00,00 & 00,01 \\ 01,01 & 01,01 \end{array} \right\}, \langle\rangle \right\rangle && (\text{D5.1})
\end{aligned}$$

Or maybe we set the output state to $\text{POP}(s^3) = s^0$ when we get a $\varnothing$ context?

Modal Subordination

It Isn't Context Copying

(7) a. If you go to the store, buy beans
b. John is really hungry, so you would need to buy lots of them

- The temporary contexts view has (7a) generate a you-going-to-the-store context, in which the consequent is asserted
- At (7b) we hit an assertion about the actual world, so the temporary context is discarded
- But then how do we resolve the anaphora to the beans in the second half of (7b) and how do we capture the fact that it is the elaboration of a scenario introduced in (7a)?

Modal Subordination

It Isn't Context Copying

- As argued extensively in Stone's "The Anaphoric Parallel between Modality and Tense", the temporary context approach to modal subordination cannot capture the robust anaphoric parallels between modality and tense
- An alternative approach is developed there which exploits functional types
- Brasoveanu has also extended van den Berg's treatment of quantificational dependencies to account for the modal dependencies involved in modal subordination
- It seems worthwhile considering how these tools might change an analysis of CQs like I&R's