Philosophical Linguistics and Linguistical Philosophy (PhLiP) 10

DID YOU EVER HAVE TO MAKE UP YOUR MIND:
Deliberation and resolution
in Inquisitive Semantics

Kjell Johan Sæbø
University of Oslo

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Agenda

Invisible verbs

Question-embedding predicates such as ..... or ....

The line by Lahiri (2002), and the two archetypes:

- Rogative predicates: Interrogatives only
- Responsive predicates: Interrogatives and declaratives

  They *wonder* whether they will ever *know* who did it.

The un(der)studied ones, such as *in two minds* and *choose*

  She is still *torn* but must soon *decide* whether she will run.

Uegaki (2019) "The semantics of question-embedding predicates"

Does it matter? How different are they?

To assess the gravity of the omission . . .

. . . look beyond the usual sources, like

- Egré (2008), Spector and Egré (2015), or
- White and Rawlins (2018), Roelofsen and Uegaki (2021)

  to the cross-linguistic database of attitude predicates created by Özyıldız et al. (2024) – which does include

Decide – alongside 42 other non-veridical responsives

We decided we'd have another but it was too late for me.

$\not\Rightarrow$ We had another.

Quite different in fact

For one thing, they strongly predict

- a control infinitival complement, (*wh*-) *to* . . .
- else, subject identity

The union$_i$ has already decided PRO$_i$ to strike

The union$_i$ has already decided whether PRO$_i$ to strike

The union$_i$ has already decided that they$_i$ will strike

The union$_i$ has already decided whether they$_i$ will strike

Secondly, they are consistently future-oriented

?? The union has decided to have gone on strike

And thirdly, a constraint of agency

The argument must be under the agent's control

– subjectively: something they believe they can bring about

? They will soon **decide** whether they will be laid off

? Some are **undecided** whether to be detained at the border

? He must **finally decide** which sister will fall in love with him

? She **decides** that she will inadvertently injure another player

While the others are all epistemic, these are technical

mind−to−world

Other responsive attitudes are sensitive to the fact of the matter

world−to−mind

but these are not: the fact of the matter is sensitive to them

Moltmann (2024): the norm and the object or its satisfiers

- Attitudinal and illocutionary objects impose norms
- The direction is m-to-w if the object is subject to the norm, it's w-to-m if the satisfiers are
- Decisions would thus have a w-to-m direction since it's not the decision that must be correct but the action decided on

But generally, only anti-rogatives have been studied for fit

So, responsives like *make up one's mind* and rogatives like *in two minds* are newcomers to the world-to-mind debate

The verb decide describes a change of state

- from a pre-state where the agent does not intend anything from among a set of options to a post-state where they do
- An interrogative complement characterizes the options, a declarative complement characterizes the chosen one

This makes good sense but the formal treatment …

- does not really bridge the set of options and the chosen one, the declarative and interrogative complement cases
- does not really bring out the role the agent's intention plays

Inquisitive Semantics is a fitting framework:

- Questions do not denote true answers
- Tools that are already there can be reforged to help model predicates of deliberation and predicates of resolution

Models contain, for each agent and world, a special issue:

- the agent's inquisitive state at the world – $\Sigma_a(w)$
- it models the issues that the agent a entertains at w
- the agent's epistemic state: $\sigma_a(w) = \bigcup \Sigma_a(w)$

The two keystone attitudes

Anne *wonders whether* Vinland was Newfoundland

Anne *knows whether* Vinland was Newfoundland
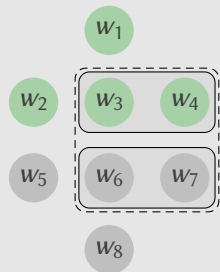
Anne *knows that* Vinland was Newfoundland

- The arguments are uniformly issues

Let

- Vinland be Newfoundland in $w_1–w_4$
- the two solid blocks stand for $\Sigma_a(w)$
- the dashed block stand for $\sigma_a(w)$

Then the top sentence only is true:

- $\Sigma_a(w) \subseteq \phi$ but $\sigma_a(w) \nsubseteq \phi$

w_1

w_2 w_3 w_4

w_5 w_6 w_7

w_8

# From a model of information to a model of resolution

Next to agent's inquisitive state, their deliberative state

- $\mathfrak{Z}_a(w)$ next to $\Sigma_a(w)$
- modeling the issues they entertain – in this sense:
  the options open to them, the choices they face:

  the propositions they are aware they can – and might
  come to intend to if they do not already – bring about

And next to their epistemic state, their resolution state

- modeling what they are set on bringing about,
- the union over their deliberative state: $\mho_a(w) = \bigcup \mathfrak{Z}_a(w)$

Example of a deliberative state
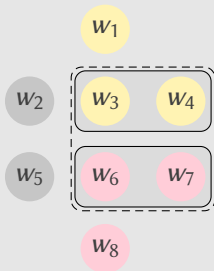
Assume that

- you study law in gray worlds
- you study linguistics in gold worlds
- you study philosophy in rose worlds

Then if your deliberative state consists in the two solid blocks, your resolution state consists in the dashed block, meaning that

- you intend to study linguistics or philosophy
- but law is out of the question for you

The two twin attitudes

- The arguments are still uniformly issues:

  Anne is undecided whether to study archaeology
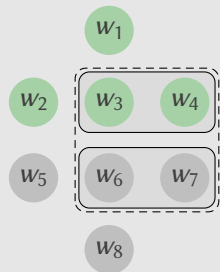 Anne has decided whether to study archaeology
  Anne has decided to study archaeology

Let

- Anne study archaeology in $w_1 - w_4$
- the two solid blocks stand for $\mathfrak{I}_a(w)$
- the dashed block stand for $\eth_a(w)$

Then the top sentence only is true:

- $\mathfrak{I}_a(w) \subseteq \phi$ but $\eth_a(w) \nsubseteq \phi$

w_1

w_2 w_3 w_4

w_5 w_6 w_7

w_8

The two modes of rogative / responsive attitude holding

| Direction of fit →	mind-to-world	world-to-mind
a's unsettled state	Inquisitive state	Deliberative state
a's settled state	Information state	Resolution state
pre-state preds	*curious, wonder, …*	*debate, torn, …*
transition preds	*learn, find out, …*	*choose, decide, …*
post-state preds	*know, aware, …*	*decided, resolved, …*

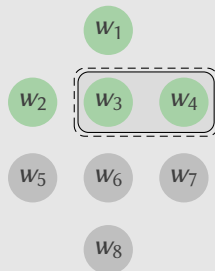From possible to actual information and resolution

Predicates of transition

From unsettled state to settled state

Σ Anne wonders whether Vinland was Newfoundland

Ƶ Anne is undecided whether she'll study archaeology
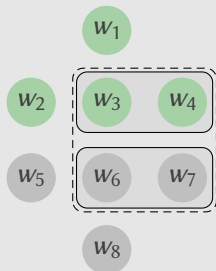
Once Anne finds out that Vinland was Newfoundland, or makes up her mind to study archaeology, the scenario narrows from left to right

Predicates of transition

A bare-bones semantics for inchoatives

$$[\![\text{ realize }]\!]_{w,t} = \lambda\phi\lambda x : \sigma_x(w, t\text{-}1) \notin \phi \, . \, \sigma_x(w, t\text{+}1) \in \phi$$

$$[\![\text{ resolve }]\!]_{w,t} = \lambda\phi\lambda x : \eth_x(w, t\text{-}1) \notin \phi \, . \, \eth_x(w, t\text{+}1) \in \phi$$

Plus a presupposition that ϕ is a live option . . .

$$\lambda\phi\lambda x : \overbrace{\mathfrak{Z}_x(w, t\text{-}1) \subseteq \phi}^{\textit{presupposition}} \land \eth_x(w, t\text{-}1) \notin \phi \, . \, \eth_x(w, t\text{+}1) \in \phi$$

gives the welcome prediction that the agent believes they can bring about whatever they may resolve to bring about – thus accounting for the agency constraint

Predicates of resolution and pseudo-factivity

And a conditional analysis of ability (Mandelkern 2024 …)

will even license the inference that the agent believes they
will bring about whatever they may resolve to bring about

Moreover, as noted generally by Heim (1992) …,

- attitudes seem to be presupposition holes: accommodating
  that somebody believes something to be the case, we tend
  to also accommodate that it is in fact the case
- Hence we will by default infer that agents will in fact
  bring about what they resolve to bring about

Support for a sharp fact mode ‖ act mode split

Knowledge ascriptions that embed infinitival questions (IQs)

- tend to convey something about the decisions facing you
- are not generally reducible to propositional knowledge

Deliberative, 'knowledge-to' ascriptions

- make reference to a decision situation, a set of options
- entail that the agent has formed an intention:

S knows what to do in D only if S intends to ϕ for some ϕ in D

The attitude predicate and the role it plays

So some seem to do double duty – spanning the split:

- *wonder*, *unsure*, ... – inquisition (Σ) $\|$ deliberation ($\mathfrak{I}$)
- *know*, ... – information (σ) $\|$ resolution ($\mathfrak{o}$)

This is underspecification, not ambiguity

Generally, the unsettled state parameter assigns to the agent a set of possibilities, which are, depending on the context,

Σ e p i s t e m i c: things that may for the agent be the case, or

$\mathfrak{I}$ c i r c u m s t a n t i a l: things that the agent can bring about

Many, but not all, predicates are sensitive to the distinction

The complement category and the role it plays

Jerzak and Kocurek (2024) assume a 1:1 relation ...

① IQ $\longrightarrow$ Deliberative knowledge
② FQ $\longrightarrow$ Propositional knowledge

... but concede that ① is not absolute:

Pace Bhatt (1999) and Roberts (2009), IQs can be deliberative, but pace ethicists like Risberg (2023), they can also be normative

Anne knows what to do   has two readings:

1 Anne has formed a belief that she should do such-and-such
2 Anne has formed an intention to do such-and-such

What to do: Act mode – fact mode

Act mode, world-to-mind case

I am trying to decide which train to take to Paris from Barcelona Sants station – either the 10:30am or 2:30pm.

Fact mode, mind-to-world case

I had the experience of trying to guess which bus to take to get within walking distance of a Calgary address.

Conjecture: covert modal concord in IQs:

- interpretable modal elements match the fact mode, uninterpretable modal elements match the act mode

What you will or should do: Fact mode – act mode

Act mode case w/ overt futurate or necessity modal in FQ

20 percent are still *undecided* how to vote ≈

20 percent are still *undecided* how they will vote ≈

20 percent are still *undecided* how they should vote

? He is *undecided* whether he should join the resistance or stay home to care for his mother. He has *decided* to stay, though.

Conjecture: overt modal concord in FQs:

- interpretable modal elements match the fact mode, un-interpretable modal elements match the act mode

What it all means

The modal element in the Q-attitude comes in two flavors:

Epistemic: it's about

① what the agent believes may be the case, and

② what they believe to in fact be the case

Circumstantial: it's about

① what the agent believes they can bring about, and

② what they intend to in fact bring about

Generally, ② $= \bigcup$ ① and

✳ Rogatives say that ① $\subseteq \phi$ where ϕ is the argument

✳ Responsives say that ② $\in \phi$ or that this becomes so

Keystone novelties

There are in the models

not just one but two functions from agents to issues in intension:

- the issues they entertain in the mind-to-world fashion (Σ)
- the issues they entertain in the world-to-mind fashion (Σ)

Not an immodest proposition

For all the parallels, there are significant differences

inquisitive state   *information state*
The president received reports but did not believe them.

deliberative state   *resolution state*
The president had the power to stop it but chose not to.

Future orientation

To properly model learning and decision-making in IS –

how open issues and options get closed and states narrow, and how possibilities become live and actively entertained, look to

A dynamic Inquisitive Semantics

✳ à la Zhang (2022), Roelofsen and Dotlačil (2023),
✳ but with broad-spectrum propositional attitudes

and to Decision Theory and the set of options, or outcomes, or prospects, standardly posited there

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