Dynamic Expressivism about Deontic Modality

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1. Aims of semantics: **communication**, **consequence** and **composition**

2. Expressivism and these aims of semantic theory

3. Compare two forms of **expressivism**

   - Semantic thesis (Gibbard, Starr)
   - Pragmatic thesis (Yalcin)

4. An articulation of the former using dynamic semantics and applied to deontic modals (at least *may* and *must*)

1 What Does Semantics Explain?

- What are linguistic meanings good for?

  1. A theory of linguistic communication (Saussure, Lewis)
     - X sends a signal σ to Y
     - How does Y appropriately respond to this signal?
       - Y exploits knowledge/dispositions specific to σ (Since σ is linguistic, this can't be general world-knowledge)
       - Y integrates this with all-purpose reasoning mechanism and information specific to this signaling event

  2. A theory of consequence (Frege, Tarski)
     - ψ follows from ϕ, but why?
       - Accepting ϕ commits one to accepting ψ; why?
       - Something about the 'nature' of these commitments

  3. A theory of composition (Frege, Davidson, Montague)
     - Speakers can interpret infinitely many sentences. How do they pull this off with limited memory?
       - interpret = grasp the meaning
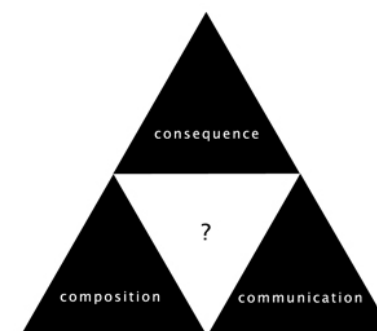   - Sentence meaning is determined from the meanings of its parts and syntactic structure

Figure 1: The Semantic Pyramid, Missing Something

- Communication

  - Starting point: X sends a signal σ to Y, and Y needs to appropriately respond to σ.
  - Lewis-Stalnaker end point:
    - There's a mutually grasped rule associating σ with a proposition $[\![\sigma]\!]$ (set of worlds)
    - What's presupposed is also modeled with a proposition: c
      - *Presupposed*: mutually accepted for the purposes of the exchange
    - X's signal induces a change, $c' = c \cap [\![\sigma]\!]$
    - Y selects action with knowledge that presuppositions are c'
    - **Upshot**: 'uptake' is determined by $[\![\phi]\!]$ and c
      - And potentially a pragmatic rule of 'uptake'

- Consequence

  - Starting point: accepting ϕ commits one to accepting ψ because of what ϕ and ψ mean
  - PWS end point: $\phi \vDash \psi \iff [\![\phi]\!] \subseteq [\![\psi]\!]$ (for all $[\![\cdot]\!]$)
    - To accept ϕ is to commit oneself to ϕ being true: $w_@ \in [\![\phi]\!]$
    - Thus: if $\phi \vDash \psi$ then accepting ϕ commits one to accepting ψ

- Composition

  - Starting point: $[\![\phi]\!]$ is determined by each $[\![\phi_i]\!]$ and ϕ's syntactic structure, for the i constituents of ϕ
  - End point: $[\![\phi]\!]$ is a function of each $[\![\phi_i]\!]$ and ϕ's syn. structure
    - $[\![\mathsf{Ran(jan)}]\!] = \{w \mid [\![\mathsf{jan}]\!](w) \in [\![\mathsf{Ran}]\!](w)\}$, $[\![\phi \wedge \psi]\!] = [\![\phi]\!] \cap [\![\psi]\!]$

- How do the three relate? Two important interconnections...

  1. Need for systematic, mechanistic explanations relates composition to consequence and communication
     - Consequence:
       - How would our theory of consequence suffer without a compositional semantics?
       - First: unless $\llbracket\phi\rrbracket$ depended on each $\llbracket\phi_i\rrbracket$, there would be no non-trivial consequences
       - Second: $\phi(\beta) \vDash \psi$ if $\llbracket\alpha\rrbracket = \llbracket\beta\rrbracket$ (for all $\llbracket\cdot\rrbracket$) and $\phi(\alpha) \vDash \psi$ $\phi(\alpha)$ means α occurs in ϕ
         - ▷ Think $\llbracket\mathsf{but}\rrbracket$ and $\llbracket\mathsf{and}\rrbracket$
       - *Mechanistic*: $\llbracket\cdot\rrbracket$ characterizes the behavior of each symbol so completely that if $\llbracket\alpha\rrbracket = \llbracket\beta\rrbracket$ then they are 'interchangeable parts'
     - Communication
       - We can not only interpret indefinitely many sentences, we can communicate with them
       - Again, a mechanistic constraint seems plausible: $\llbracket\phi(\alpha)\rrbracket = \llbracket\phi(\beta)\rrbracket$ if $\llbracket\alpha\rrbracket = \llbracket\beta\rrbracket$

  2. An evaluative attitude: **acceptance**! Relatedly, presupposition.
     - A question: why does communication need presupposition (a kind of acceptance) instead of (any kind of) acceptance?
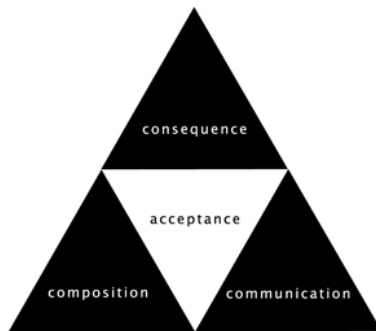

Figure 2: The Semantic Pyramid, Filled Out

- What's truth got to do with it?
  - Note truth only came up with consequence
  - There: to accept ϕ is to commit to its truth (Plausible?)

2 Expressivism and Semantic Explanation

- **Expressivism**: X uses σ to communicate a feature of X's state of mind without referring to it and stating a fact about it.

  > Such an analysis might be called 'expressivistic.' According to the analysis, claims about what it makes sense to do express a state of mind: the speaker's acceptance of a system of norms. To express a state of mind is not to say that one is in it. (Gibbard 1986: 473)

- Frege's point (Frege 1963):
  - The meaning of logical connectives is exhausted by their role in 'the laws of truth'
  - Translation: the meaning of $\neg$ is exhausted by the fact that it makes truths into falsehoods and falsehoods into truths
  - $\llbracket\neg\rrbracket$ must take a proposition (truth-conditions) and return a proposition (truth-conditions)
  - $\llbracket\neg\rrbracket$ cannot operate on anything else (speech acts, emotive content, etc.)

- Geach's point (Geach 1965):
  - Since moral terms embed under logical connectives, they cannot have an emotivist/expressivist semantics

- Is expressivist *semantics* incoherent?

- Consider Gibbard's (1986: 473; my emphasis) strategy:

  > To a first approximation, my analysis is this: to say it makes sense for someone to do something is to express one's **acceptance** of a system of norms that, as applied to the agent's circumstances, permits the thing in question.

- The basic idea: give a semantics which assigns **acceptance** conditions to sentences, rather than truth-conditions

- The obstacle: pull this off while still assigning truth-conditions to some sentences and predicting their truth-conditional interactions with connectives? (Esp. since expressivist)
  - But given §1, it seems like this should be possible!

- The plan: start with epistemic, but focus on deontic modals and overcome the obstacle there with a **dynamic semantics**

3 Dynamic Expressivism

3.1 Factual Discourse

- Propositional logic (s is a set of worlds, worlds are valuations):

  Definition 1 (Update Semantics)

(1)	$s[\mathsf{p}]$	$=$	$\{w \in s \mid w(\mathsf{p}) = 1\}$	(2)		$s[\neg\phi]$	$=$	$s - s[\phi]$
(3)	$s[\phi \wedge \psi]$	$=$	$(s[\phi])[\psi]$	(4)		$s[\phi \vee \psi]$	$=$	$s[\phi] \cup s[\psi]$

  - s is a state; a set of worlds
  - $[\phi]$ is a function from states to states
  - $s[\phi]$ is the result of applying that function to s

- Semantics does not directly assign truth-conditions

  - My spin: it assigns them a role in **information processing**

- At least nominally, **Truth** is **not** the central concept here

  - Consequence, composition and communication do not, across the board, appeal to truth-conditions
    - Modulo atomics… this would change in a predicate logic
    - States become sets pairs of worlds and 'referent systems'
    - A referent system assigns referents to variables, predicates and names in worlds
    - Truth-conditions are available, but no need to reify them

- Instead: **support**; truth a special case (Starr 2010)

  Definition 2 (Support, Truth in w)

  (1) Support $s \vDash \phi \Leftrightarrow s[\phi] = s$ (2) Truth in w $w \vDash \phi \Leftrightarrow \{w\}[\phi] = \{w\}$

  - Support = (informational) acceptance
  - von Fintel & Gillies (2007: 50) don't distinguish the two
  - "The universe… would only be one fact and one great truth for whoever knew how to embrace it from a single point of view." (d'Alembert 1995: 29) [1751]
  - Correspondence with the truth amounts to acceptance once uncertainty has been resolved
  - Foreshadowing: it just isn't *useful* to talk about truth conditions of claims turning crucially on uncertainty
    - Uncertainty is involved w/deontic and epistemic modals

- Consequence:

  Definition 3 (Dynamic Consequence)
  $\phi_1, \ldots, \phi_n \vDash \psi \Leftrightarrow \forall s : s[\phi_1]\cdots[\phi_n] \vDash \psi$

- Accepting premises amounts to accepting conclusion

  Definition 4 (Classical Consequence)
  $\phi_1, \ldots, \phi_n \vDash_{Cl} \psi \Leftrightarrow \forall w : \{w\}[\phi_1]\cdots[\phi_n] \vDash \psi$

  - Truth of premises guarantees truth of conclusion

- Truth-conditions are derivative:

  Definition 5 (Propositional Content) $[\![\phi]\!] = \{w \mid w \vDash \phi\}$

- Classical connective behavior is a corollary:

  Corollary 1 (Possible Worlds Semantics)

(1)	$[\![\mathsf{p}]\!]$	$=$	$\{w \in W \mid w(\mathsf{p}) = 1\}$	(2)		$[\![\neg\phi]\!]$	$=$	$W - [\![\phi]\!]$
(3)	$[\![\phi \wedge \psi]\!]$	$=$	$[\![\phi]\!] \cap [\![\psi]\!]$	(4)		$[\![\phi]\!] \cup [\![\psi]\!]$	$=$	$[\![\phi]\!] \cup [\![\psi]\!]$

  - It's **as if** connectives were propositional operators

- At this point, we have two **conceptually distinct**, but **empirically equivalent** semantics

  - Empirical equivalence:
    - Communication: $s[\phi] = s \cap [\![\phi]\!]$
    - Consequence: $\phi_1, \ldots, \phi_n \vDash \psi \Leftrightarrow \phi_1, \ldots, \phi_n \vDash_{Cl} \psi$
    - Compositional:
      - First, suppose $[\phi]$ is composed from $[\alpha_1], \ldots, [\alpha_m]$
      - Then for all s: $s[\phi] = s \cap [\![\phi]\!]$ if $[\![\phi]\!]$ is composed from $[\![\alpha_1]\!], \ldots, [\![\alpha_m]\!]$ (modulo 'mode of composition')
      - Second, suppose $\phi(\beta) \vDash \psi$ if $[\alpha] = [\beta]$ (for all $[\cdot]$) and $\phi(\alpha) \vDash \psi$ ($\phi(\alpha)$ means α occurs in ϕ)
      - Then $\phi(\beta) \vDash_{Cl} \psi$ if $[\![\alpha]\!] = [\![\beta]\!]$ (for all $[\![\cdot]\!]$) and $\phi(\alpha) \vDash_{Cl} \psi$ ($\phi(\alpha)$ means α occurs in ϕ)
  - The Expressivist: **perfect**!
    - I can be an expressivist about logical vocabulary!
      - Though probably not atomic sentences (on this model)
    - Logical vocabulary doesn't 'refer' to propositional operations
      - It guides way information is processed
    - Basically: wide conceptual role semantics (Harman 1987, 1988)
    - But maybe this isn't expressivism of the *interesting kind*?

- Foreshadowing: even with empirically equivalent semantics, one can ask whether it leaves the pyramid intact

  - We're better off with a theory that leaves it intact than one that doesn't; even if they're empirically equivalent!

- **Interesting forms of Dynamic Expressivism**:

  1. Find phenomena where empirical equivalence breaks down
     - The idea: these are phenomena where semantics based on acceptance, instead of truth, fares better
     - Communication: find phenomena where $\nexists p\, \forall s : s[\phi] \neq s \cap p$
       - *Might* $s[\diamond\phi] = \{w \in s \mid s[\phi] \neq \varnothing\}$; $s[\diamond\phi] \neq s \cap [\![\diamond\phi]\!]$ (Veltman 1996)
       - Reply: equiv. restored by allowing information-dependence $s[\diamond\phi] = s \cap [\![\diamond\phi]\!]_s$ if $[\![\diamond\phi]\!]_s = \{w \in s \mid s \cap [\![\phi]\!] \neq \varnothing\}$
       - Anaphora beyond syn. scope (Groenendijk & Stokhof 1991)
       - Reply: equiv. restored by structuring $[\![\phi]\!]$ (Heim 1990; Elbourne 2005) or the update rule (or both) (Dekker 2012; Lewis 2012)
     - Composition: find phenomena where $\exists s : [\phi] \neq s \cap p$ and p is compositionally derived from ϕ's constituents
       - Compositional semantics of polysynthetic languages w/o implausible LF movement (Bittner 2001, 2003, 2007)
       - Conditional-interrogative link and nuances of conditionals w/multiple *if*s in antecedent (Starr to appear c)
       - Compositional make-up of subjunctive conditional antecedents (Starr to appear b)
       - The mixture of imperatives and declaratives w/sentential connectives (Starr 2012)
  2. Extending these methods to some linguistically or philosophically interesting class of 'atomic sentences', e.g. *Murder is wrong*
     - One salient project in metaethics

- A project that might have the benefits of both:
  - Dynamic expressivism about **deontic modality**
  - Even if it doesn't work out for deontic predicates, one could for metaethical purposes provide an error theory of that discourse
    - Without having to embrace the same position about deontic modality
    - Thereby providing a less costly account of moral discourse that doesn't need mind-independent moral values

3.2   Dynamic Expressivism about Deontic Modality

- Let's warm up with epistemic modality

- E.g. Veltman's (1996) semantics of *might*; Gillies' (2004) indic. cond.

  Definition 6 (Dynamic Epistemic Modals)
  (1) $s[\diamond\phi] = \{w \in s \mid s[\phi] \neq \varnothing\}$ (2) $s[\square\phi] = \{w \in s \mid s \vDash \phi\}$
  (3) $s[(\text{if } \phi)\, \psi] = \{w \in s \mid s[\phi] \vDash \psi\}$

- This semantics doesn't explain:
  - How modals are, in some sense, informative
    - Various options (Beaver 2001; Yalcin 2011; Willer 2013; von Fintel & Gillies 2011; Starr to appear a)
    - Simple idea for *might*: scale up states to sets of propositions (think: relevant alternatives); $\diamond\phi$ introduces $[\![\phi]\!]$ as a relevant alternative while testing that a ϕ-world is live
    - Partial Idea for *might*: scale up states to a probability space $\langle W, F, P \rangle$; $\diamond\phi$ moves from a field that doesn't contain $[\![\phi]\!]$ to one that does and assigns it a non-zero probability
    - Simple idea for $(\text{if } \phi)\, \psi$: return maximal output state such that $s[\phi] \vDash \psi$ (Starr to appear a)
  - What body of information is s?
    - Again, various options (von Fintel & Gillies 2011; Willer 2013; Starr to appear a)

- *Does* capture Yalcin's (2007) data, even $\neg\phi \vDash \neg\diamond\phi$ and $\diamond\phi \nvDash \phi$
  - The data he uses to motivate his version of expressivism

- Epistemic contradictions don't embed (Yalcin 2011, 2007)

  (1)   # It's raining and it might not be raining

  - Why? A descriptivist-friendly explanation:
    - Well, (2) is also bad
      (2) It's raining and I don't know it's raining
    - It is Moore-paradoxical: it asserts something whose truth undermines the epistemic grounds for the utterance itself
    - But on descriptivist views (1) says, basically, (2)
      - So let's just give the same (pragmatic) explanation!
  - Yalcin: embedded, *might* still bad, but *know* now ok
    (3)   a. # Suppose it's raining and it might not be raining
          b. Suppose it's raining and I don't know that it's raining
    (4)   a. # If it's raining and it might not be raining…
          b. If it's raining and I don't know that it's raining…

- The pragmatic analysis of (1) does not extend to (6) or (7)
  - ‣ It required both conjuncts to be *asserted*

- Epistemic contradictions:
  - $s[\mathsf{p} \wedge \Diamond\neg\mathsf{p}] = s[\mathsf{p}][\Diamond\neg\mathsf{p}] = \varnothing$
    - ‣ After eliminating the ¬p-worlds the $\Diamond\neg\mathsf{p}$ test will fail!
  - This sentence is **inconsistent**: it turns any state into $\varnothing$.
  - $\Diamond\neg\mathsf{p} \wedge \mathsf{p}$ is **incoherent**: no non-empty state supports it.
    - ‣ $\Diamond\neg\mathsf{p}$ requires a ¬p-world in s
    - ‣ But p will eliminate all such worlds
    - ‣ So $s[\Diamond\neg\mathsf{p} \wedge \mathsf{p}] \neq s$ unless $s = \varnothing$
  - Both are bad as sentences, but $\Diamond\neg\mathsf{p} \ldots \mathsf{p}$ can be fine as a discourse if two different states of information are used
  - Since both antecedents of conditionals and attitude operators require acceptance of their scope, epistemic contradictions will remain infelicitous when embedded.

- What about promiscuous epistemic modals?

Figure 3: Promiscuous Modals in the Wild (Ithaca)

  - Yalcin's approach: a *sui generis* information parameter in a truth-conditional semantics
  - What about the dynamic approach? See discussion of 'what body of information is s' above

- Warm up over; let's think about deontics

- First question: what mental state to use?
  - Decision theory: **preference** is the key conative attitude in practical reasoning.
    - ‣ Or, if you like numbers, you can go with utility
  - Formally, binary orderings on worlds: $w_1 \geq w_0$, read 'w_1 is at least as preferable as w_0'.

- When $w_0 \geq w_1$ and $w_1 \geq w_0$, the agents are indifferent about w_0 and w_1 ($w_0 \equiv w_1$).
- When $w_0 \geq w_1$ and $w_1 \not\geq w_0$, the agents strictly prefer w_0 to w_1 ($w_0 > w_1$).

- A new model of states:
  - Deontics interact w/both information and preferences, so updates are defined on $\langle s, \geq \rangle$, rather than s.
  - Notation: $s_{\geq}$ instead of $\langle s, \geq \rangle$
  - Background assumption: s is a subset of the worlds over which $\geq$ is defined

- A new semantics:

Definition 7 (May and Must)
(1) $s_{\geq}[\mathsf{May}(\mathsf{p})] = \{w \in s \mid \exists w_0 \in s_{\geq}[\mathsf{p}] \ \& \ \exists w_1 \in s_{\geq}[\neg\mathsf{p}] : w_0 > w_1\}_{\geq}$
(2) $s_{\geq}[\mathsf{Must}(\mathsf{p})] = \{w \in s \mid \forall w_0 \in s_{\geq}[\mathsf{p}] \ \& \ \forall w_1 \in s_{\geq}[\neg\mathsf{p}] : w_0 > w_1\}_{\geq}$

  - This limits *may* and *must* to worlds within s
  - Explains why both are infelicitous after accepting $\neg\phi$ (Ninan 2005)
    - ‣ Both would lead to $\varnothing$
  - Relatedly: epistemic interpretation follows from deontic one
  - Predicts only deontic and epistemic interpretations
    - ‣ By expressing something about how $\geq$ orders worlds in s you can either express something about s (if you take $\geq$ to be null-ordering) You can either be expressing something about s or about $\geq$, or both
      - ▷ E.g. you may take your shoes off during this talk
  - Caveat:
    - ‣ This model likely needs to be scaled up by using a probabilistic refinement of s
    - ‣ And a utility-theoretic refinement of $\geq$
    - ‣ While *may* and *must* don't appear to be gradeable, other vocabulary that would appeal to $\geq$ is, e.g. *I want/prefer a beer more than I want/prefer a coffee*
    - ‣ Not my innovation: Yalcin, Cariani, Lassiter, etc.

- What kind of expressivism?
  - The semantics "informationalizes preferences"
    - ‣ Relates deontic state to epistemic state
  - New kind of expressivism: **relational expressivism**, which has interesting advantages over older kinds (Schroeder to appear)

- The same semantics for connectives given earlier allows these deontic claims to embed under connectives with ease (read set-theoretic operations as applying to the s component of $s_\geq$)

- A different kind of expressivism:

  - Imperatives could be analyzed as operating on $\geq$ alone (Starr 2012)
  - While disjunctions, conditionals and conjunctions embed imperatives, negation does not
  - Well-motived *untempered expressivism* (Schroeder to appear)

- How to motivate the expressivism for deontics?

- Deontic contradictions parallel the epistemic:

  (5) (Context: corrupt boxer consults his boss about his chances of winning and whether he has to take a dive.)

  Boss: # You'll definitely loose and you may win

  - Embedded, *may* still bad, but *permits* ok

    (6) a. # Suppose you'll definitely loose and you may win
         b. Suppose you'll definitely loose and the boss permits winning
    (7) a. # If you'll definitely loose and you may win...
         b. If you'll definitely loose and the boss permits winning...

- Free choice:

  - States: preferences over alternative **propositions** (Starr 2012)
  - Use tools from decision theory to say which alternatives count as best given an ordering of them
  - Define a **dynamic consequence relation** to track not information, but which alternatives count as best
  - Basic Predictions: identical to Barker (2010)
    - But the semantics is easier to work with than linear logic's!
    - No need for different flavors of relevant connectives
  - Further predictions:
    (8) Farmer: *You must feed the cows or take the goat for a walk*
    - Son goes to goat shed and remembers the goat's been taken to slaughter.
    - Prediction: the son must feed the cows

4   Pragmatic Expressivism

- Yalcin (2007, 2011, 2012) defends expressivism about epistemic modals

  1. This form of expressivism is *pragmatic*
  2. The semantics is (allegedly) **truth-conditional**
  3. It's the *uptake* that's expressivist: it is a speech act whose characteristic effect on the common ground is not (merely) to add some new representational content, but rather to influence its 'structural character' (Yalcin 2012: 144)
  4. 2 and 3 require decoupling communication and composition:

     ...[T]here has been a tendency – not just in the expressivist literature, but in the philosophy of language literature at large – to conflate (i) the compositional semantic contribution of a clause with (ii) the sort of thing the sentence characteristically adds to the common ground of a conversation. But it is a mistake to conflate these notions. They correspond to very different theoretical roles. (Yalcin 2012)

  5. How does 2 grapple with the question of truth?

     Expressivists have felt cornered on the question of truth. If they deny that normative discourse is truth-apt, they fall prey to the Frege-Geach problem; if they affirm it is, it becomes hard to see how [their position differs] from that of the factualist. If they go minimalist about truth, their position applies to all of language, not just a fragment of it. I am suggesting that the expressivist – or one attractive brand of expressivist, anyway – can say what is distinctive about his position by exploiting the independently motivated distinction between compositional semantic value and informational content. And I have suggested that one concrete way of doing this begins from the perspective of two-dimensional semantics. Like the factualist, the expressivist defines a notion of truth at a point of evaluation. Thereby he vindicates the undeniable compositionality of natural language. But unlike the factualist, he rejects the view that the sentences of the relevant discourse are apt for truth in a richer sense, the sense of truth which applies to factual information content – the kind of content whose main business is to rule out ways things might be. (Yalcin 2011: 330)

- **Critical point**: this decoupling leaves basic questions unanswered

  - It is not clear how speech acts involving epistemic modals change the common ground

- Especially ones like *Andy is in the bar and he might be drinking a beer*; *Andy has a beer or Josh might have some whiskey*; *Don't throw rocks because people may be below*
  - Most natural amendment to Yalcin's story causes problems for his answer to the truth issue; though view is still *interesting*

4.1 Yalcin's Expressivism

- Yalcin uses an **information parameter** s (a set of worlds):

  Yalcin Semantics $[\![\mathsf{Might}(\phi)]\!]_{k,w,s} = 1 \iff \exists w' \in s : [\![\phi]\!]_{k,w',s} = 1$

  - Key: w is not mentioned on the right-hand side

- What does this semantics say about epistemic contradictions:
  $[\![\phi \wedge \mathsf{Might}(\neg\phi)]\!]_{k,w,s} = 1 \iff [\![\phi]\!]_{k,w,s} = 1 \ \& \ \exists w' \in s : [\![\phi]\!]_{k,w',s} = 0$

  - There are k, w, s for which the epistemic contradiction is true, so it is not a contradiction
  - But, there is no s in which the epistemic contradiction is *accepted* (Yalcin 2007:1004)

    Acceptance ϕ is accepted in s iff $\forall w \in s : [\![\phi]\!]_{k,w,s} = 1$

    - $\mathsf{p} \wedge \mathsf{Might}(\neg\mathsf{p})$ requires $\forall w \in s : [\![\mathsf{p} \wedge \mathsf{Might}(\neg\mathsf{p})]\!]_{k,w,s} = 1$.
      - ▷ The first conjunct requires: $\forall w \in s : [\![\mathsf{p}]\!]_{k,w,s} = 1$
      - ▷ The second: $\exists w' \in s : [\![\mathsf{p}]\!]_{k,w',s} = 0$
      - ▷ These are inconsistent demands on s!
  - So epistemic contradictions are unacceptable!

- Yalcin (2007:998): indicative conditional semantics to predict (7)

  Indicative Conditional $[\![\phi \rightarrow \psi]\!]_{k,w,s} = 1 \iff \forall w' \in s_\phi : [\![\psi]\!]_{k,w',s_\phi} = 1$

  - $s_\phi := \mathrm{MAX}\, s' \subseteq s : (s' \neq \varnothing \ \& \ \forall w' \in s' : [\![\phi]\!]_{k,w',s'} = 1)$

- On this view, indicative conditionals, like epistemic modals, constrain the information parameter only, and not the world parameter

- The basic idea is to shift to an information state where ϕ has been accepted and make sure that ψ has been accepted.

  - But when ϕ is $\mathsf{p} \wedge \mathsf{Might}(\neg\mathsf{p})$, there will be no such state

- So the truth of the indicative conditional could not be defined

  - Hence epistemic contradictions are infelicitious in antecedents of indicatives

- The semantics for belief/supposition works similarly (Yalcin 2007:995)

Belief $[\![\mathsf{Bel}_\mathsf{A}(\phi)]\!]_{k,w,s} = 1 \iff \forall w' \in s_A^w : [\![\phi]\!]_{k,w',s_A^w} = 1$

  - s_A^w is the set of worlds compatible with what A believes in w

- It says that ϕ has been accepted in A's state of information in w

- False for epistemic contradictions: no info state accepts them!

- What about classical **consequence**? Objection (Yalcin 2007:1011):

  - Intuitively $\neg \Diamond \phi$ follows from $\neg\phi$
  - But not classically
  - "Suppose the following. (1) Nobody – including ourselves – knows whether or not there is lead on Pluto, and indeed nobody is even close to having any evidence on the question of whether there is lead on Pluto. (2) As a matter of fact, there is no lead on Pluto. Now, on the basis of the information provided by these two premises, is the following sentence true or false?

    (9) There might be lead on Pluto

    There is a strong pull to answer 'false'." (Yalcin 2007:1011)

- This suggests that the notion of consequence appropriate to epistemic modals is *acceptance*, not truth:

  - **Informational Consequence**
    $\phi_1, \ldots, \phi_n \vDash \psi \iff \forall \mathcal{M}, k, s: \psi$ is accepted in s if $\phi_1, \ldots, \phi_n$ are
    - The key: you evaluate ψ against a state that accepts premises

- This predicts the inference from $\neg\phi$ to $\neg \Diamond \phi$

  - Once you've accepted $\neg\phi$ you've ruled out ϕ-worlds, so there does not exist a world that makes ϕ true.
  - That's just way $\neg \Diamond \phi$ says

- Yalcin sharply distinguishes two kinds of truth

  - The truth of a content (real truth!)
  - The semantic value 1 used to distinguish a space of points (the other truth)

- This raises a question he's never explicitly answered:

  - Since we need content for communication, how do we extract content from his semantics?
  - How does that square with his position on truth?

- How does **communication** with epistemic modals work?

○ "Relative to a context, an epistemic possibility claim determines a condition, or property, on states of information – on states of mind. It is the satisfaction of this property that the speaker aims to coordinate his listeners on. The speaker thereby expresses a feature of his state of mind, and does so without describing himself, or the world." (Yalcin 2011: 329)

- We only have a semantics in terms of semantic-value-1

  ○ How are they put to use to convey something?

  ○ The only way I know how to think of this from a static perspective is taking a content and integrating it that being used to model the common ground

- Is the content of an epistemic modal claim the set of states s compatible with it? $\{s \mid [\![\Diamond\phi]\!]_{k,s,w} = 1\}$?

  ○ **Problem 1**: how do you update a Stalnakerian context c?

  ○ **Solution**: you don't. Use it to change a more richly structured context, for example a partition of c or a division of c into relevant alternatives (Beaver 2001; Yalcin 2011; Willer 2013). Call this $C = \{c_0, \ldots, c_n\}$, where $c = \bigcup C$.

    ▸ Now you can update by intersection, keeping just those alternatives with a ϕ-world!

  ○ **Problem 2**: what about the content of $\Diamond A \wedge B$ or $\Diamond A \vee B$?

  ○ **Solution**: define sentential contents as $\{\langle w, s\rangle \mid [\![\phi]\!]_{k,s,w} = 1\}$

    ▸ Speculation: you could give up semantic-value-ism

      ▷ E.g. $[\![\phi \to \psi]\!] = \{\langle w, s\rangle \mid \forall w' \in s_\phi : \langle w', s_\phi\rangle \in [\![\psi]\!]\}$

    ▸ Assign contents of this kind, define $\wedge$ as $\cap$, etc.

    ▸ Semantic value expressivism begins to look like aether: truth in a world relative to some information is just $\langle w, s\rangle \in [\![\phi]\!]$

  ○ **Problem 3**: how do you update C with contents of this kind?

  ○ **Solution**: it's not so hard

    ▸ $C + [\![\phi]\!] = \{s \mid \langle w, s\rangle \in [\![\phi]\!] \ \& \ \exists c_i \in C : s = c_i \cap W_\phi\}$

      ▷ Where $W_\phi = \{w \mid \langle w, s\rangle \in [\![\phi]\!]\}$

    ▸ Keep ϕ states, but only the ones that arise from states/alternatives in C by incorporating any constraints on worlds carried by ϕ

  ○ **Problem 4**: if expressivism means 'doesn't eliminate worlds' then this isn't an expressivist pragmatics. Suppose C contains an alternative c which does not contain a ϕ-world and happens to contain the only ψ-world. Then accepting $\Diamond\phi$ will eliminate the ψ-world. Maybe this is a technical issue; doesn't seem to be.

"But unlike the factualist, [the expressivist] rejects the view that the sentences of the relevant discourse are apt for truth in a richer sense, the sense of truth which applies to factual information content – the kind of content whose main business is to rule out ways things might be." (Yalcin 2011: 330)

  ▸ Is the key this idea of 'main business'?

○ **Problem 5**: we now have contents, sets of $\langle w, s\rangle$, and the rent's come due. How can we deny predicating truth, of the serious kind, to them?

  ▸ Requires world and 'some information' to be a certain way

  ▸ Factualist interpretation:

    ▷ Fix on a world, and then some information, which is also in some world

    ▷ Sentences can then either say something about the information, or something about the world

    ▷ Either: describing something about a world

  ▸ Differs slightly from relativism: information needn't be attached to agents, let alone the evaluator

  ▸ If relativism is factualist, how can this small difference take you from factualism to expressivism?

  ▸ It flows purely from the idea that s is *sui generis* in the evaluation of modals

    ▷ But that seems consistent with the idea that information is always in or about a world

  ▸ Further, how plausible is this view about information states?

  ▸ Distinguish:

    ▷ s is not uniquely determined

    ▷ s is completely undetermined

- Where do we stand?

  ○ Yalcin's approach leaves the semantic pyramid in ruin

    ▸ Maybe fine if there weren't an option that didn't

  ○ Expressivism seems illusive

- The dynamic view distinguishes truth and support (acceptance)

  ○ Interesting dynamic expressivism adds operators where support rather than truth is needed to analyze composition, consequence and communication.

  ○ This replaces Yalcin's attempt to articulate expressivism in terms of two kinds of truth

- What is expressivism?
  - Not: some range of discourse cannot be viewed as truth-apt
  - It's that the range of discourse can be analyzed in terms of **acceptance**, without recourse to reference
  - By 'analyzed in terms of *acceptance*', I mean acceptance is used to analyze composition, consequence and communication
  - Intuitive distinction: the meaning relation is not a generalization of the reference relation
    - Compatible with weak referentialism: names and predicates refer, but that isn't their compositional meaning; it's something like world-knowledge
    - Nicely integrates generative and philosophical traditions in semantics; two parts of the same project
- Is expressivism too ubiquitous?
  - Well, it is ubiquitous...

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