1 Overview - ‘operators’

- The conditional operator (if ... then): ⇒
- Irrealis (were, past tense etc.): *
- Epistemic modals
  - might: the speaker’s knowledge is compatible with ...
  - would: the speaker’s knowledge requires ...

2 Conditionals

(1) Hvis jeg skrur på bryteren, blir det lys. (indicative)
(2) Hvis jeg skrudde på bryteren, ble det lys. (past indicative)
(3) Hvis jeg skrudde på bryteren, ville det bli lys. (counterfactual)
(4) Hvis jeg hadde skrudd på bryteren, ville det ha blitt lys. (past counterfactual)

Ramsey test for conditionals in Update Semantics:

- \( \sigma + [\phi \Rightarrow \psi] = \sigma \)
  - if \( \sigma + [\phi] + [\psi] = \sigma + [\phi] \)
  - \( \emptyset \) otherwise
3 Modals in Veltman’s update semantics (1996)

(5) #It is not sunny. It might be sunny.
(6) It might be sunny. It’s not sunny.
    • $\sigma + [\text{Might} \phi] = \sigma$
      - if $\sigma \cap [\phi] \neq \emptyset$
      - $\emptyset$ otherwise

(7) A. Kim teased Pat.
    B. Kim would do that.

4 Might and Would as (weak) duals

(8) #John might come to the party but John would not come to the party.
(9) #John would not come to the party but John might come to the party.
(10) #John would come to the party but it’s not the case that John might come to the party.

5 (Indicative) conditionals and epistemic modals

(11) A: If one of the grounds staff committed the crime, then it was the driver.
    b. B: No, it might have been the groundskeeper.

\[ \neg(\phi \Rightarrow \psi) \iff \Diamond(\phi \land \neg \psi) \]

6 Modals in counterfactuals

(12) If I were not to sleep tonight, I would topple over tomorrow (I might topple over tomorrow).

7 Modal subordination (Roberts 1989, Frank 1997)

(13) A wolf might walk in. It would eat you first.
(14) A wolf might walk in. #It will eat you first.
(15) A wolf might walk in. It might eat you first.

(static vs. dynamic semantics; collective vs. distributive semantics)
8 Problems for anaphoric accounts of modals

(16) John doubts/claims that a tiger will walk in. But a wolf might walk in. It would eat you first.

(17) A wolf might walk in. It probably wouldn’t eat you. But a tiger might walk in, and it definitely would eat you.

(18) A wolf might walk in. Then again one might not. #It (#The wolf) would eat you first.

(19) A wolf might walk in. Then again one might not. I’m (not) concerned about it (that, the possibility).

9 Modal subordination in counterfactuals

(20) A wolf might walk in. If it were to eat you first, I’d be unhappy, but not as unhappy as if it ate me first.

10 Problems for Lewisian counterfactuals

(21) a. If John were to come to the party, it would be fun.
    b. But of course if John were to come to the party, he might have a heart attack and that wouldn’t be fun.
11 Putting it all together...

- a distributive dynamic semantics for quantifiers
- a non-distributive semantics for modals
- contexts as quadruples: a world, an assignment and two sets of epistemic possibilities
- the initial state for the interpretation of a discourse =
  \{< w, \emptyset, G, F >: w \in W\}, where
  \( G \) (Global set of possibilities) = \( F \) (focussed set of possibilities) = \( < w, \emptyset > \)
- \( \sigma[\phi \Rightarrow \psi]_\sigma \) iff
  - every \( \phi \) descendant of \( \sigma \) has a \( \psi \) descendant and
  - every \( \phi \) descendant of \( F_\sigma \) has a \( \psi \) descendant.
- \( \sigma[irr(\phi)]_\sigma(\frac{G_{\phi}}{w_{\phi}} \cdot \frac{F_{\phi}}{w_{\phi}}), \) where:
  \( w \in 1(\sigma) \ast [\phi] \).
- \( \sigma[Might\phi]_\sigma(G_{\phi} F_{\phi}), \) where:
  \( F' \) is a \( \phi \) descendant of \( F_\sigma \), provided there are \( \phi \) descendants in \( F_\sigma \).
  If not, then \( F' \) is a \( \phi \) descendant of the maximal set of \( G_\sigma \) that have \( \phi \) descendants.
  \( \sigma[Might\phi]_\sigma(\emptyset) \) otherwise.
- \( \sigma[Would\phi]_\sigma(G_{\phi} F_{\phi}), \) provided \( G' \) and \( F' \) are specified in one of two ways:
  - \( G' \) is a \( \phi \) descendant of \( G_\sigma \) and \( F' \) is a \( \phi \) descendant of \( F_\sigma \) or,
  - \( F' \) is a \( \phi \) descendant of \( F_\sigma \) and \( G' = (G_\sigma - F_\sigma) \cup F' \).
  \( \sigma[Would\phi]_\sigma(\emptyset) \) otherwise.

(22) John might come to the party. If he’s still smoking, he’ll annoy everyone else there.

(23) A wolf might walk in. If it were to eat you, I would be unhappy.