

PHIL 6710: Epistemic Modality  
Week 2

1. *From last time.* An example from Thomas to show that there is a shifty epistemic reading of ‘the ball must have been under cup 1.’ That is:  $\text{past}(\text{must}(\text{ball under 1}))$ , rather than  $\text{must}(\text{past}(\text{ball under 1}))$ . That is: a reading on which the knowledge that matters is the knowledge that *used* to be had, not the knowledge that is *now* had:

John was more successful yesterday betting on which cup the ball is under than he has been today. We ask John why and he says, ‘Because yesterday the ball must have been under cup 1, whereas today it might also be under cup 2.’

2. Some other ‘shifty’ readings?:
  - a. Why is Jane looking in the kitchen? Because her keys {might, must} be there.
  - b. If there {might, must} be snipers in the trees, use your flamethrowers.

**Kinds of modality<sup>1</sup>**

3. The following sentences have multiple readings (truth-conditionally different), not due to scope ambiguities between temporal and modal operators:
  - a. The keys have to be in the kitchen
  - b. You must go to bed in 10 minutes
  - c. I have to sneeze
  - d. It’s possible to park your car there
  - e. Fermat’s Last Theorem might have been false
  - f. I can lift this rock
4. It is standardly said that this is because there are different kinds of possibility and necessity:
  - a. epistemic
  - b. deontic
  - c. bouletic / boulomaic / preferential
  - d. circumstantial / dynamic / dispositional
  - e. physical
  - f. logical / metaphysical / alethic
  - g. teleological (you have to take a taxi to get home in time (given the options))
  - h. ...

Logical possibility is typically said to be the most encompassing kind of possibility, but we will see reasons to question this.

5. We are particularly promiscuous with ‘have to’:<sup>2</sup>

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<sup>1</sup> Kratzer (1977, pp. 343-55), Kratzer (1991), von Fintel (2006), von Fintel and Gillies (2007, pp. 35-7).

<sup>2</sup> von Fintel (2006).

- a. It has to be raining
- b. Visitors have to leave by 6pm
- c. You have to go to bed in 10 minutes
- d. I have to sneeze
- e. You have to take a taxi

6. We have ways of clarifying (of making the kind of modality explicit?):

- a. Given {what we know, the rules of the house}, the keys have to be in the kitchen
- b. For all {I know, the rules of the house say}, the keys might be in the kitchen

Do these still have multiple readings? Compare: ‘That man over there, he is tall.’

7. When it is not made explicit we have, in the terminology of von Stechow and Gillies (2007), a *bare modal*.

8. Does any bare modal have, for each kind of possibility, a reading on which that kind of possibility is the relevant kind? Or: can we make the same modal claim using any of the various constructions? Does it depend on the kind of modality? Try it:

- a. The keys might be in the kitchen
- b. You might take your shoes off

Perhaps ‘might’ has special restrictions on its use (like ‘it’, ‘she’, and ‘he’ do).

9. Here is a possible restriction: negative polarity modals:

- a. You need not worry
- b. \*You need worry (is this right?)

10. Question: ‘The ball might have been under cup 1’ – are there two readings of this when we fix on metaphysical possibility?

- a. It is metaphysically possible that it was the case that the ball is under cup 1
- b. It is the case that it was metaphysically possible that the ball is under cup 1

11. What should we conclude from these multiple readings about the meaning of modal operators? Three options:

- a. They are ambiguous (Hacking (1967)). Compare:
  - i. I went to the bank
  - ii. I didn’t go to the bank
- b. They are not ambiguous but context-sensitive. Compare:
  - i. He is happy
  - ii. He is not happy

- c. They are like ‘ready’:<sup>3</sup>
  - i. John is ready
  - ii. John is not ready

12. “We should combine a shared semantic core with mechanisms for modulating the core meaning in context.”

### Standard semantics<sup>4</sup>

- 13. A sentence relative to a context expresses a proposition. ‘John is in Boston’ relative to a context *C* expresses the proposition that *a* is in *b*, where *a* is the thing determined by ‘John’ in *C*, and *b* is the thing determined by ‘Boston’ in *C*.
- 14. The proposition that *a* is in *b* is *true* iff *a* is in *b*. It is true in/at/of a world *w* iff *a* is in *b* in/at *w*. The proposition thus determines a function from worlds to truth values. It is sometimes taken to *be* this function. It is sometimes taken to be the *set of worlds* in which this function is true.
- 15. Sometimes the context provides things, the provision of which is not explicitly triggered by the sentence. Example: in some contexts there is an action *a*, determined by the context, such that ‘John is ready’ relative to that context expresses the proposition that John is ready to *a*.
- 16. The sentence ‘John might be in Boston’ (and its variants) in a context *C* expresses a proposition that is true in a world *w* iff the proposition that John is in Boston is *compatible with* *f(w)*, where *f* is some function from worlds to sets of propositions, determined by *C*. Such a function is called a *conversational background*.
- 17. An utterance of ‘John must be in Boston’ (and its variants) in a context *C* expresses a proposition that is true in a world *w* iff the proposition that John is in Boston *follows from* *f(w)*, where *f* is some conversational background determined by *C*.
- 18. More generally:
  - a. ‘Possibly *S*’ in a context *C* expresses a proposition that is true in a world *w* iff the proposition expressed by *S* in *C* is compatible with *f(w)*, where *f* is some conversational background determined by *C*.
  - b. ‘Necessarily *S*’ in a context *C* expresses a proposition that is true in a world *w* iff the proposition expressed by *S* in *C* follows from *f(w)*, where *f* is some conversational background determined by *C*.
- 19. We have the following standard analyses:

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<sup>3</sup> Kratzer (1977, p. 341).

<sup>4</sup> Kratzer (1977, 1981, 1991).

- a. A proposition  $p$  is *compatible with* the propositions in a set of propositions  $S$  iff  $p$  is true in *some* world in which all the propositions in  $S$  are true.
- b. A proposition  $p$  *follows from* the propositions in a set of propositions  $S$  iff  $p$  is true in *every* world in which all the propositions in  $S$  are true.

20. If this is right then we have:

- a. 'Possibly  $S$ ' relative to a context  $C$  expresses, for some conversational background  $f$  determined by  $C$ , a proposition that is true at a world  $w$  iff the proposition expressed by  $S$  relative to  $C$  is true in some world in which every proposition in  $f(w)$  is true.
- b. 'Necessarily  $S$ ' relative to a context  $C$  expresses, for some conversational background  $f$  determined by  $C$ , a proposition that is true at a world  $w$  iff the proposition expressed by  $S$  relative to  $C$  is true in every world in which every proposition in  $f(w)$  is true.

21. Worlds in which every proposition in  $f(w)$  is true are sometimes said to be worlds that are *f-accessible* from  $w$ . The function  $f$  determines an *accessibility relation* ' $\rightarrow$ ' on the set of all worlds:  $w \rightarrow w'$  iff every proposition in  $f(w)$  is true at  $w'$ .

22. In some contexts the conversational background is explicitly given: 'For all I know, John might be in Boston'.

When this sentence is uttered the conversational background determined by the context of utterance  $C$  is a function whose value at a world  $w$  is the set of propositions that the speaker in  $C$  knows in  $w$ .

So in  $C$  it expresses a proposition that is true at a world  $w$  iff it is compatible with what the speaker in  $C$  knows in  $w$  that John is in Boston.

23. We get an *epistemic* reading of 'possibly  $S$ ' iff the conversational background is a function whose value in each world is a set of things known in that world, a *deontic* reading iff it is a set of laws in that world, a *physical* reading iff it is a set of physical laws, etc.

We need to be careful here: what if  $f(w)$  is the set of physical laws in  $w$ , and in every world the physical laws are known?

24. Note that need to take laws to be *descriptive*: 'no one sits on the lawn', rather than 'no one may sit on the lawn'.

For suppose this is the only rule. If I utter 'John may sit on the lawn,' is the proposition that I express true or false? If we take the rule to be 'no one sits on the lawn' then it is false, as desired: the propositions that John sits on the lawn and that no one sits on the lawn are not compatible – there is no world in which they are both true. If the rule is 'no one may sit on the lawn' then it seems to be true, as undesired: the propositions that John sits on the lawn and that no one may sit on the lawn seem to be compatible.