Conditionals in Paris 2019

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Class 3. Interaction with Actuality

Jackson (1987) observes that subjunctive conditionals can be used to contrast counterfactual possibilities with how things actually are, while indicative conditionals cannot.

(1) If Oswald didn't shoot Kennedy, things are different from how they actually are.
(2) If Oswald hadn't shot Kennedy, things would be different from how they actually are.

As Jackson observes, the subjunctive conditional (2) is true, but (1) sounds nonsensical. No matter who shot whom, things are not different from how they actually are; they are exactly as they actually are.

This is related to an observation of Stalnaker (1975); indicative conditionals with a consequent saying that something is the way it actually is sound trivial, whereas subjunctive conditionals with a consequent like express substantive claim.

(3) If the patient had taken arsenic, he would show just the symptoms which he does, in fact, show.
(4) If the patient took arsenic, he shows just the symptoms which he does, in fact, show.

(3) seems to provide an argument that the patient is likely to have taken arsenic; this is Anderson's example showing that subjunctives need not have antecedents presupposed to be counterfactual.

Jackson argues based on the pair in (1) and (2) against possible worlds theories of the indicative conditional. According to such theories, if the antecedent of an indicative conditional is false, then the selected world(s) of the antecedent will be worlds other than the actual world. At such worlds, reasons Jackson, it is true that things are different from how they actually are. So the theory should predict that the conditional is (1) is true if Oswald did shoot Kennedy.

Actuality operators

Certain claims are not expressible in first-order modal logic. (Crossley & Humberstone 1977)

(5) It could have been the case that everyone who actually is rich was poor.

$\Diamond\forall x(Rx \supset Px)$ - this formula is true at a world w if there is an accessible world w' such that at w', everyone who is rich is poor (at the same world).

$\forall x(Rx \supset \Diamond Px)$ - this formula is true at a world w if everyone who is rich at w is such that there is an accessible world w' at which that individual is poor at w' — but it need not be the same world for each individual. In other worlds, the formula does not require that they all could have poor together.

The sentence can be expressed if we add an actuality operator *A* to the language, with the following semantics. We add to the model a designated actual world @, and then the semantic clause for *A* states that *Ap* is true at a world *w* iff *p* is true at @. With such a language, we can express (5) as follows:

$\Diamond\forall x(ARx \supset Px)$

Two-dimensional semantics

Once the actuality operator is introduced into the language, a sentence's truth needs to be relativized to a pair of worlds in the model. A formula is no longer assigned truth relative to a single world *w,* but to a pair of worlds (@, *w*) where formulas containing *A* are true at (@, *w*) if they would be true in a standard valuation at *w*, but *Ap* is true at (@, *w*) if the valuation assigns *p* truth at @.

Davies and Humberstone (1980) point out that one can generalize this notion by relativizing a sentence's truth to a pair of worlds *(w, w'*), and introduce operators that shift the world considered as actual as well as shifting the world of evaluation. Weatherson (2001) proposes that the indicative conditional, but not the subjunctive conditional, is an operator. Weatherson proposes truth conditions as follows.:

$p \rightarrow_i q$ is true at (w, w') iff the closest possible world w'' such that p is true at (w'', w''), is such that q is true at (w'', w'').

$p \rightarrow_s q$ is true at (w, w') iff the closest possible world w'' such that p is true at (w, w''), is such that q is true at (w, w'').

In other words, indicative conditionals shift the world considered as actual, while subjunctive conditionals do not. This means that (1) is predicted to be false at all worlds of evaluation and (4) will be true at all worlds of evaluation (at least where the presuppositions that there are symptoms is met). Weatherson also allows the closeness relation on worlds to vary between indicative and subjunctive conditionals.

Problems with Actuality and "Actually"

The operator *A* is standardly pronounced "actually", motivated by its appearance in sentences like (3). This has led some philosophers to think that "actually" in English has the meaning of the actuality operator. However, this is dubious; inside a subjunctive conditional, what is really both sufficient and necessary for a clause to be evaluated at the actual world rather than the selected world is the indicative (or lack of "fake past") on the embedded clause, not "actually". (See Wehmeier 2004).

(4) If I were seven feet tall, I would be taller than I actually am.
(5) If I were seven feel tall, I would be taller than I am.
(6) If I were seven feet tall, I would be taller than I would be.
(7) If I were seven feet tall, I would be taller than I actually would be.

Humberstone (1982), motivated in part by phenomena like this, observes that in the language with the actuality operator, there are pairs of formulas (p and Ap for each p) such that one is carried along to be evaluated at other worlds by modal operators and one is held fixed at the actual world in the scope of a modal. There is no inherent need, Humberstone points out, for the unmarked form to be the one that is shifted by modals and the marked form to the one held fixed. It could be the other way around. He therefore defines a language with a subjunctivity operator S, which has a semantics that works in the following way. First, an intermediate valuation assigns the nonmodal fragment of the language a truth value at each world in the standard way. Then, p is true in a model at a world w iff the intermediate valuation assigns p truth at the actual world, while Sp is true at a world w iff the intermediate valuation assigns p truth at w. Essentially p is true where Ap is true in the other logic, while Sp is true where p is true in the other logic. Since the indicative in (4)-(5) is the same form that is the form used for ordinary basic unembedded assertion, this logic is arguably closer to the structure of natural language than the one with the actuality operator.

Object-language quantification over possible worlds

Quantification over possible worlds appears in the metalanguage in which the semantics for the object language of modal logic is stated. Similarly, it appears in the metalanguage in which Kratzer states her semantics for modality in natural language. An alternative approach postulates that there are variables ranging over possible worlds in the object language itself.

With this approach, the problematic (5) can be expressed without the addition of special operators, by allowing one of the world variables under the scope of the modal to remain free.

(5) It could have been the case that everyone who actually is rich was poor.
$\exists w_1 \forall x(\mathrm{R}xw_0 \supset \mathrm{P}xw_1)$

Standardly, binding of variables in natural language is blocked when there is a mismatch of features (such as gender, in the individual case):

(8) Every man wore his hat. (*2 readings, with "his" bound or free*)
(9) Every man wore her hat. (*"her" can only be read free*)

If we think of indicative and subjunctive mood as features on variables like gender on individual pronouns (Schlenker 2006, Mackay 2013), we might explain why the subjunctive conditional cannot bind the world variable in the embedded indicative clause.

(1) If Oswald didn't shoot Kennedy, things are different from how they actually are.

$\forall w_0$(Oswald didn't shoot Kennedy at $w_0 \supset$ things are different at w_0 from how they are at w_0.)

(2) If Oswald hadn't shot Kennedy, things would be different from how they actually are.

$\forall w_1$(Oswald didn't shoot Kennedy at $w_1 \supset$ things are different at w_1 from how they are at w_0.)

But still there is a potential problem. In Weatherson's two-dimensionalist semantics, the indicative conditional <u>automatically</u> shifts the world considered as actual for the entire clauses in its scope. But standardly, even where a match of feature allows a variable to be bound, a free reading is also available; that is why (8) has two readings. So this approach seems like it should predict that (1) has a reading where the embedded clause contains a free variable and does refer back to the actual world, as it does in (2).

But … maybe it does, after all?

(example from Kai von Fintel):
(10) She doesn't know that she is where she is.
(11) I don't know that I am where I am.

Use in *modus tollens?*
(12) Look, you think Oswald didn't kill Kennedy? Well, consider this. If Oswald didn't kill Kennedy, then well-documented evidence was totally falsified. And that's just not how things actually are. So if Oswald didn't kill Kennedy, things are different from how they actually are. So Oswald did kill Kennedy.

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