Conditionals I: the material conditional

1 Introduction

In Philosophy 12A you were taught to formalize English conditionals using the horseshoe (‘⊃’). You were probably also taught that this wouldn’t always give good results, that it should be considered a simplification that is useful for some purposes, etc.

In this unit we’re going to consider:

- Can we come up with truth conditions for English conditionals that do better than horseshoe?
- If not, why not? Is it because the horseshoe does capture the truth conditions for English conditionals? Or is it because conditionals don’t have truth conditions at all?
- What logical principles hold for English conditionals? What about the inference from “A or B” to “if not-A, then B”? Is modus ponens even valid?

As you’ll see, this material has links to both the earlier discussion of modal logic and the discussion of entailment, relevance, and reasoning that we’ve been having. It’s also very much a live discussion, with quite a bit of recent work on the subject.

2 Indicative vs. counterfactual

It’s commonly accepted that there are two fundamentally different varieties of conditionals in English (and other natural languages), indicative and subjunctive.

The distinction is marked, often, by differences in grammatical mood (indicative or subjunctive). Here is a nice minimal pair that shows the difference:

(1) If Oswald didn’t shoot Kennedy, someone else did. [indicative]
(2) If Oswald hadn’t shot Kennedy, someone else would have. [subjunctive]

To see the difference, ask yourself what would be evidence for each.

If we think that Kennedy was, in fact, shot, then we’ll accept (1) without any additional evidence. We know someone shot him. If it wasn’t Oswald, then it must have been someone else. Here we’re not considering an alternative “possible world” or counterfactual possibility. We’re asking about what really happened.

By contrast, (2) is hardly trivial. You might accept (2) if you had evidence that Oswald didn’t act alone, and was part of a larger conspiracy including backup shooters. Or if you
think that so many people wanted to kill Kennedy that someone else would have stepped up. But if you think Oswald was acting alone, and an anomaly, you’d reject (2).

Because it could be rational to accept (1) and reject (2), they would seem to have different truth conditions.

A note on terminology. I’ve called (2) a “subjunctive” conditional. You’ll often hear the terminology counterfactual, which refers to the fact that we’re considering a possibility in which things are different (counter to) the way they actually are. But don’t think that a counterfactual conditional is a conditional with a false antecedent, and an indicative a conditional with a true antecedent. You can have a subjunctive conditional with a true antecedent. (Suppose you think you turned in the wrong homework assignment, when actually you didn’t. You say: “If I hadn’t turned in the wrong homework assignment, I would have passed the class.”) You can also have an indicative with a false antecedent, as in (1) above. That said, it would be weird to assert a counterfactual that you knew had a true antecedent, or an indicative that you knew had a false antecedent—we’ll consider why as we go along.

It seems pretty clear that subjunctive conditionals don’t have the truth conditions of the material conditional. After all, we use them when we know the antecedent is false, and in those cases the corresponding material conditional is always true! But we have pretty clear intuitions that some are false.

(3) If I had dropped this pencil, it would have bounced off the floor and hit the ceiling.

(4) If I had yelled my lecture from home, you would have been able to hear it from here.

People have developed accounts of the truth-conditions of subjunctives. The most famous is probably David Lewis’s, explained in his book Counterfactuals [2]. We won’t be discussing these, though. Our topic will be indicatives. Here it’s less clear whether the material conditional truth-conditions are correct.

3 Testing our intuitions

Let’s take a poll about which of these are true or false. Take out a sheet of paper, and take a few minutes to decide which of these you think are true and which false. If you think it’s wrong to call a sentence either true or false, you can put ?.

(5) If Obama is a Republican, Iraq is in Europe.

(6) If Obama is a Republican, Iraq is in the Middle East.

(7) If Obama is a Democrat, Iraq is in the Middle East.

(8) If Obama is a Democrat, Iraq is in Europe.

Discuss the results of the poll. What if anything does this show?
4 Entailments between indicatives and material conditionals

One way to get clearer about the truth conditions of indicatives is to ask about entailments.

Nearly everyone accepts that the indicative conditional ‘if P, Q’ entails the material conditional:

\[
\frac{P, Q}{P \supset Q}
\]

This is necessary if Modus Ponens is to work. For suppose ‘if P, Q’ were true and ‘P \supset Q’ false. Then P would have to be true and Q false. So we’d have a counterexample to Modus Ponens (MP).

Next week we’ll look at McGee’s argument that MP in fact fails for the indicative conditional. But if we want our conditional to respect MP, we’d better keep this entailment.

More controversial is the converse entailment:

\[
\frac{P \supset Q}{\text{if } P, Q}
\]

If this held, ‘if P, Q’ would be equivalent to ‘P \supset Q’, and the material conditional analysis of indicatives would be correct.

The “received opinion,” as Thomson calls it, is that this entailment fails: the indicative is strictly stronger than the material conditional.

That is: for ‘if P, Q’ to be true, ‘P \supset Q’ must be true, but some other condition must hold as well. (Relevance, causal connection, good reason for…?)

This is Thomson’s target.

5 Thomson against the “received opinion”

I want to highlight two main points Thomson makes:

• It may be that assertions of ‘if P, Q’ typically do communicate that there is some non-truth-functional connection between P and Q. But that does not mean that such a connection is required for the truth of ‘if P, Q’.

• It may be that it is bad reasoning to move from ‘not-P’ to ‘if P, Q’. But that does not mean that ‘not-P’ does not entail ‘if P, Q’.

5.1 What is said vs. what is implied

If I assert a disjunction, my audience will generally assume that I don’t know which disjunct is true, since if I did, I would have made the stronger assertion. Otherwise I’d be uncooperative, and it’s generally assumed that conversational partners won’t withhold relevant information. For example, if I say

John’s in Rapallo or somewhere in the Shetlands,
5.1 What is said vs. what is implied

you'll assume I don't know that he's in Rapallo. (This point is due to Paul Grice; see “Logic and Conversation,” in [1].)

Examples with quantifiers:

(9) Cal has won all of the games it has played this year.
(10) Cal is one of the biggest employers in Berkeley.
(11) I have finished some of my assignments.

Examples with disjunctions:

(12) He is either at the bar or studying.

If ‘if’ is just ‘⊃’, everything said about disjunctions will carry over:

(13) If he is not at the bar, he is studying.

Perhaps this is bad to assert for exactly the same reason as (12): namely, that it misleadingly suggests that you don’t know which disjunct is true.

In saying ‘if $p$ then $q$’ a speaker will say something which is in general anyway true or false. But by the act of making the statement he will do other things too. He will encourage us to think that he has some or other reason for thinking that if $p$ then $q$ and that his reasons are not such as to allow him to assert $\neg p$ nor such as to allow him to assert $q$…. What is odd about [our conditionals] will now seem this: if someone were to assert any of them, he would not, we feel, be making a sensible assertion act. [3, p. 67]

If this is the “data”, it doesn’t support the received opinion.

Thomson thinks that if we really focus on truth, and not on what’s communicated, we’ll be swayed to the material conditional view.

The astronomer example:

(14) If I clap my hands there will be an eclipse.

Three points of view on this:

The natives: They accept (14) because they think on supernatural grounds that there’s a causal connection.

The astronomer's: He accepts (14) because he thinks the consequent is true.

Ours: We accept (14) because we know the astronomer would only clap his hands when he knows there will be an eclipse.

Thomson concludes:

So we have the phenomenon of one and the same statement made for three quite different kinds of reason: the astronomer’s, cogent but dull; the savages’, not dull but silly; ours, cogent, and far from silly. Plainly then, it will not do to import the reasons for which the conditional is asserted into the meaning of the conditional. [3, p. 69]
5.2 Good reasoning vs. entailment

We’ve already got the distinction, from Harman, between good reasoning and entailment. It’s not always good reasoning to follow entailments forward. So, from the fact that an inference looks like bad reasoning, it does not follow that the conclusion is not entailed by the premises.

Moving from ‘not-P’ to ‘if P, Q’ might be bad reasoning because, if one is asserting the latter solely on the basis of the former, there is nothing one can do with the latter that one could not already do with the former. So, the conclusion is junk: it follows logically from the premises, but there’s no point in drawing it as a conclusion.

Thomson illustrates this with the complex example of an oracle and an acolyte. The oracle sometimes contradicts itself, and then the acolyte has to figure out which statements to erase [3, p. 65].

Suppose the oracle says Q. It would be pointless for the acolyte to infer ‘if P, Q’, even though this follows logically. For

- If later the oracle said P, there’d be no need to do MP to get Q, because the acolyte already has Q.
- If later the oracle says not-Q, the acolyte couldn’t use Modus Tollens to get not-P. Rather, since his only basis for holding ‘if P, Q’ is his acceptance of Q, on learning not-Q he would have to give up the conditional.

So there is no point to drawing the inference from Q to ‘if P, Q’. But that doesn’t give us grounds for thinking that the inference is invalid.

References

