

How to Believe a Conditional

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1. Before I can say how we believe conditionals I'll have to sketch the causal theory of belief in *non*-conditional singular propositions on which our account of conditional beliefs depends. This theory takes actions to be *caused* by the token beliefs and desires that explain them, where a token belief or desire is the fact or event of an agent's having that belief or desire at a time, as when I go to a nearby pub at noon because I want a half of their cider then.
2. Three points about this theory. First, we'll only be applying it to *contingent* beliefs, i.e. to beliefs in contingent propositions. Second, the theory is deterministic: it takes beliefs and desires to *determine* the actions they cause, not just to make them more probable. And third, it takes these mental causes of an action to be what John Mackie called 'INUS' conditions of it, meaning that each will only be necessary and sufficient for it given not only its other mental cause but also all the action's *non*-mental INUS conditions, such as the road to my pub being passable.
3. The fact that *token* beliefs are INUS causes of token actions makes *type* beliefs dispositions: believing my pub has my favourite cider is being disposed, among other things, to go there if and when I want it, can get to the pub, and so on. Different desires will of course give this belief of mine different effects: for example, wanting to eat without being tempted to drink cider may make that belief take me to a coffee shop instead.
4. In short, beliefs entail causal functions from desires to actions, just as desires entail causal functions from beliefs to actions. And different beliefs entail different functions, just as different desires do. For example, believing my pub is shut, but the one next door is open, will take me there instead if and when I want a drink.
5. This example illustrates the fact that the mental INUS causes of most if not all actions include more than one belief: believing my pub has the cider I want won't take me there unless I also believe the pub's open. This turns the causal functions that relate beliefs

and desires to actions into large sets of simultaneous equations which may or may not have unique solutions. That is, they may or may not suffice, as functionalists hope they will, to distinguish every contingent belief from every other.

6. Still, if the variable *effects* of our beliefs and desires aren't enough to differentiate all of them, we can always add their *causes*: like seeing someone entering a pub, which causes me to believe it's open, or my hangover causing me to want a hair of the dog, in this case another cider ; and so on. And of course beliefs and desires also interact, as when my belief that it's noon (caused by hearing a clock strike twelve) causes me to want lunch. And so on.
7. Whether even adding all these causal links is enough to differentiate all our contingent beliefs is a moot point, which I shan't try to argue here. All I'll do here is apply this theory, complete or not, to beliefs in contingent conditionals; after which Mat will first meet a well-known objection to that application of it, and then extend the application to cover universal and existential beliefs.
8. A few more points, before I start, about the basic theory of unconditional beliefs. First, we can ignore *intentions*, which beliefs and desires also cause, especially when an action is to be done not now but later: as when I intend at 11 am to go to the pub when it opens at noon. If that intention persists until I believe it's noon, it will be an INUS cause of my then going to the pub: INUS not because its having that effect depends on a desire – it doesn't – but because it depends on my acquiring the tensed belief that it's now noon.
9. We can also ignore the fact that actions are affected not just by the agent's beliefs and desires but by how strong they are. Allowing for that, by postulating degrees of belief and desire, turns the causal theory into a reading of subjective decision theory, a theory whose probabilistic features are, fortunately, irrelevant to our present argument.
10. What *is* relevant is that this theory of belief – like its extensions to cover intentions and degrees of belief – is a *descriptive* theory, not a normative one. It's a theory of how agents *do* act, not of how they *should* act. *That* depends on whether the beliefs they act on are right, i.e. true, or at least reasonable, i.e. justified by evidence. What makes

beliefs right or reasonable is for *other* theories, of truth and of epistemology, to tell us; what *our* theory tells us, rightly or wrongly, is what beliefs *are*.

11. There are two other questions which I should note that our theory *doesn't* answer before I apply it to conditional beliefs. One is the question of what makes beliefs 'occurrent', i.e. conscious, since beliefs needn't be conscious to cause actions, i.e. to be 'occurrent' in the more sensible sense of that unhelpful word. For example, when setting out to cross the road, I'm rarely conscious of the belief – that we drive on the left – which causes me to look right before crossing. What makes this, or any other, belief conscious, when it is, is a good question, but it's not one that this theory is, or should be, required to answer on its own.
12. The other question our theory needs extending to answer follows from its applying just as well to languageless animals heading for their watering holes as to us language-users heading for ours. In this case, though, the extension is pretty obvious: what we need is a Gricean theory of communication. After all, speech acts too are actions, caused by beliefs and desires: as when I say 'the pub's open' because I want you to believe it is, and believe that my aiming that sentence at you will cause you to believe that, and act accordingly.
13. So much for caveats: now, at last, for how a causal theory of contingent beliefs applies to contingent conditionals, like 'my pub will be open if it's after noon'. We say, following Robert Stalnaker, that to believe such a conditional is to be disposed to believe its consequent if I believe its antecedent. So to believe that my pub will be open if it's after noon is to be in a state which, if and when I come to believe it *is* after noon, will cause me to believe my pub's open.
14. In short, and in general, to believe 'if P then Q' for contingent unconditional 'P' and 'Q' is to be disposed to infer Q from P. And if that's how you come to believe Q – which of course it may not be – then this so-called 'inferential' disposition is an INUS cause of your belief that Q, since it will only have that effect if you also believe P.
15. These *inferential* dispositions differ importantly from the *non-inferential* ones that embody non-conditional beliefs. The difference is that, like *intentions*, the other INUS

conditions of their effects needn't include desires. For whereas believing my pub's open will only take me there if I want a drink, believing the pub will be open if it's after noon will make me believe it's open – if I believe it's after noon – whatever I want.

16. This difference between conditional and non-conditional beliefs reflects a difference in what makes them right. Non-conditional beliefs are right if they're *true*; conditional beliefs are right if they *preserve* truth: that is, if believing 'If P then Q' won't make you infer a false 'Q' from a true 'P'. This doesn't of course stop conditionals having truth values. For if believing 'If P then Q' is being disposed to infer 'Q' from 'P', that disposition will be right, i.e. truth-preserving, if and only if 'Q' is true or 'P' is false, i.e. if the truth-functional material conditional, 'If P is the case, Q is', is true.
17. But how then does believing *that* conditional differ from believing the *non-truth-functional* hypothetical conditional 'If P *were* the case, Q *would* be'? The difference, I say, isn't in the inferential *disposition* but in its causes and effects. After all, my belief that Q *needn't* be caused by my inferring it from P: it can be caused by perception, as when I believe my pub's open because I'm *in* it. In *that* case it's my belief that Q which causes me to believe 'If P then Q', not the other way round.
18. And that, I suggest, is the difference. If I only believe 'If P then Q' because I believe 'Q', then the content of my conditional belief is 'Q or not-P', i.e. the material 'If P is the case, then Q is'. Whereas if my belief in 'If P then Q' *isn't* caused by my belief that Q but is what *causes* it – if I also believe 'P' – then the content of my conditional belief is the hypothetical 'If P *were* the case, Q *would* be'.
19. So far so good, though not of course far enough, since at least two questions remain. One, which we'll leave as an undemanding take-home exercise, is how, on this theory, we believe conditionals that *contain* other conditionals: like 'If I go to that pub if it's open, then I'll be there all afternoon', or 'If the pub's open, then I'll go in if I feel thirsty'.

20. The question we *will* tackle here is that of *contraposition*. How, on this theory, is believing 'If P then Q' related to believing 'If not-Q then not-P'? Our answer depends on the fact that our theory says you can't believe 'P' and 'not-P' simultaneously. Take the belief that my pub's open, which disposes me to go there if I want its cider. But then to believe it's *not* open is *not* to be so disposed; and I can no more both have and lack that disposition simultaneously than something can be simultaneously soluble and insoluble in water. And similarly for any other contingent unconditional belief: to believe any such 'Q' is to have at least one disposition which you'd lack if you believed 'not-Q'.
21. So if you've come to believe 'Q' by inferring it from P, you can't at the same time also believe 'not-Q'. In other words, you can't simultaneously believe 'P', 'If P then Q' and 'not-Q': you can have any two of these beliefs at once but not all three. So if you believe 'If P then Q' and 'not-Q', you can't also believe 'P'. But why not, on our theory?
22. Our answer is that believing 'If P then Q' is not *only* being disposed to believe 'Q' if you believe 'P'; it's *also* being disposed to believe 'not-P' if you believe 'not-Q'. In other words, it's the very same state as that of believing 'If not-Q then not-P': these are not two mental states but one: the disposition to infer Q from P and not-P from not-Q. That's what enables my modus ponens to be your modus tollens.
23. That's our theory of how we believe conditionals. Or rather, that's the easy bit of it. The hard bit is explaining away some well-known apparent counterexamples, especially to contraposition. So, since Mat has many more little grey cells left than I have, I'll leave him to do that before extending our theory of conditionals to cover universal and existential generalisations, like 'all ravens are black' and 'some swans are black'. Over to Mat.