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Supposition, Conditionals and Unstated Premises*

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Abstract: Informal logicians recognise the frequent use of unstated assumptions; some (e.g. Fisher) also recognise entertained arguments and recommend a suppositional approach (such as Mackie's) to conditional statements. It is here argued that these two be put together to make argument diagrams more accurate and subtle. Philosophical benefits also accrue: insights into Jackson's apparent violations of modus tollens and contraposition and McGee's counterexamples to the validity of modus ponens.

This paper is an attempt to improve the accuracy and utility of suppositional approaches to the portrayal of conditional reasoning such as advocated by the present author (1988), on the basis of unpublished lecture notes by the late John Mackie, and much more accessibly by Fisher (1988). When 'If P then Q' is seen as a matter of supposing that 'P' and then going on to assert 'Q' in the scope of that supposition, it is usually noted that other unstated premises may be crucially involved in the thinking within the supposition. The major innovation suggested here is that the role of these unstated premises be explicitly recognised in diagramming the reasoning. It will be shown how this gives greater accuracy and subtlety to such argument diagrams. The philosophical benefits of adopting such an account will be illustrated by an application to McGee's (1985) supposed counterexamples to the validity of modus ponens and to some of Jackson's (1979) examples of odd conditionals.

After a survey of various accounts of conditionals and if-sentences, Mackie offered this general analysis: "to say 'If *P*, *Q*' is to assert *Q* within the scope of the supposition that *P*" (1973, p. 93). He offered the idea of supposing and asserting something within the scope of a supposition as an external analysis of what people are doing when they are thinking about possibilities. "A supposition may introduce not only the single item that is supposed, but a complex picture, which is held together and partly determined by what else the supposer associates with this first item, typically by retaining and carrying over elements from the actual world." Elements of the picture may well be unknown to the supposer; he may be committed to filling out his story in non-arbitrary ways.

Mackie noted that this suppositional account was close to those that view conditionals as condensed arguments, but was broader in that it did not require the link between antecedent and consequent to be a matter of reasoning. Indeed Mackie claimed that the intellectual performance involved may not be essentially linguistic.

Mackie examined several different types of conditional statement, arguing that the suppositional account made sense of them all. But finally he conceded that some of our ways of using language (such as 'He believes that if *P*, *Q*' or 'It is true that if *P*, *Q*') cannot be easily made to fit the view. He suggested that "any if-sentence may have both a propositional and a non-propositional employment. The non-propositional employment is ... primary, and the suppositional account explains it. The propositional employment is secondary, and comes into play when the condensation of the previous suppositional procedure (most frequently some

inference) reaches the point where we tend to treat the product as a single unit" (1973, p. 103). He allowed that we may make various choices about which proposition a particular conditional expresses (the corresponding material conditional, or literal talk of a possible world, or ...).

Fisher is not concerned to arrive at a general, albeit messy, account of conditional statements. He simply wishes to extract and evaluate arguments from written texts and to provide diagramming techniques that do this perspicuously. He notes that a very frequent style of arguing is not to assert one's starting points but merely to suppose them for the sake of the argument. In providing techniques for dealing with such cases, Fisher comes close to endorsing an analysis like Mackie's, remarking that "there is clearly a very close relationship between saying 'if R then C' and saying 'Suppose R. Then C.' For our purposes we take them to be equivalent, and which way to construe a piece of natural language reasoning depends entirely on which seems simplest and most natural" (1988, p. 88). But while he says this in general, he seems to require that they be treated as compound conditional statements whenever a conditional is the conclusion of an argument (as in "conditional proof" in natural deduction systems).[1]

One might ask whether a suppositional rendering of a conditional in a wider argument would ever be inappropriate. Mackie's programme would suggest a negative answer, and might encourage the belief that a suppositional analysis should be all but mandatory, for the sake of the greater discriminations it allows. But to be able to argue for this using Fisher's apparatus we have to make a few adjustments which can be motivated by saying a little more than Fisher does about the utility of conditionals understood suppositionally.

The main point is one that can be taken over from those theories that stress the relevance of the antecedent to the consequent of normal conditionals. A conditional allows the speaker to advert to a relation or connection between two factors without having to make the nature of the connection any more precise—in a story framed by the antecedent you will get the consequent (perhaps because of a logical or causal connection, perhaps not). Indeed, in very many cases the speaker might not be able to make any reasonably precise specification of the connection, as Barwise, for instance, also notes in his discussion of the informational content of conditionals (1986).[2] Jackson says that the utility of having the conditional construction[3] lies in the importance of being able to use modus ponens (1979, p. 577). But while we may agree that the role of conditionals in inference is particularly important, I would suggest that their first benefit is their ability to introduce connections between two factors in the imprecise way mentioned. It is clear that counterfactual conditionals,[4] for instance, are not being used with an eye to modus ponens since their users often claim to know the falsity of their antecedents. Ordinary indicative conditionals likewise are often used with no hope of going on to assert their antecedents: 'if you step on that ladder you will break your leg' is more likely a warning intended to keep the antecedent false.

Granted that normally we would not be inclined to advert to connections on no basis whatever and that we are not concerned only with simple logical entailments of the antecedent, it follows that in many cases the grounds for the assertion within the supposition go beyond the supposition itself, as Mackie noted. Not only do they often involve this appeal to unstated additional premises, but in some uses of conditionals the supposition itself does not really play any role in supporting the subsequent assertion: the whole weight rests on unstated premises. (Mackie claims that this is true of all even-if-sentences, 1973, p. 93.) In this last case in particular, Fisher's usual diagram[5] for suppositional reasoning —(Suppose) ⁿR --> ⁿC—begins to look

very odd since the arrow, intended to stand "for the logical relationship which is presented by the speaker as obtaining between R and C" (1988, p. 87), stands for virtually nothing.

My suggestion for improving the verisimilitude of our diagrams is simply to allow ourselves to indicate unstated premises in them. Fisher, like most other informal logicians, already does this in diagramming other arguments, so it is not a particularly large step here (but one he may himself be disinclined to take: "in this chapter we are not especially interested in such implicit assumptions" (1988, p. 83)). One respect, however, in which it may be somewhat awkward is that the utility of suppositional reasoning is often connected with our inability to specify these unstated claims in any reasonably precise way. To take one of Fisher's simple examples:

> Suppose the Government wants to raise bank interest rates. Since the Government also wants to keep mortgage rates down it will clearly have to issue directives to the building societies.

Here the supposition together with the other stated premise sustains the conclusion in conjunction with various beliefs about the motives of building societies, the power of government directives, the relations between the two rates, and so on. These may well be uncontroversial (they ought to be if we are to happily accept the reasoning) but no easier to specify for all that. Labelling this bundle of unstated premises 'U' and using other letters for the explicit components, the revised diagram would be:

(Suppose) ^{u}B)
+)
M) --> ^{u}D
+)
[U])

I have claimed that on occasions the explicit supposition is not in fact used in the reasoning to the conclusion. To diagram this contingency, I suggest retaining the brackets linking statements but dropping the plus signs that indicate the collaboration of such statements in the reasoning. The brackets would then picture the grammar; the plus signs and arrows would picture the reasoning. (These are suggestions for adapting Fisher's diagrams. If one uses boxes to enclose the suppositional segments of the reasoning similar adaptations will have to be made. It may be worth noting that these unstated premises have not been labelled with Fisher's superscripted 'u': although actually unasserted they are in general things the arguer would have to be prepared to assert outside the suppositional context.)

To see that this is not merely a logical possibility consider the following two sentences extracted from a work by M.K. Bacchus (*Education for Development or Underdevelopment*, p. 277):

> If the present situation of extremely wide income differentials between occupations continues, the process of selection for jobs will become an even more vexing issue. The assessment of work performance and aptitude, especially since the validity of aptitude tests has, so far, left much to be desired, will be a matter in which the subjective impressions of a supervisor will be crucial.

Let us use 'D' for 'The present situation of extremely wide income differentials between occupations continues', 'V' for 'The process of selection for jobs will become an even more vexing issue', 'S' for 'The assessment of work performance and aptitude will be a matter in which the subjective impressions of a supervisor will be crucial', and 'A' for 'The validity of aptitude tests has so far left much to be desired'. The problem arises when we consider what 'S' is doing. It seems to be within the scope of the supposition, 'D', and to be offering a link between that supposition and the final conclusion, 'V'—it is what makes job selection that much more vexing. But if we took it as an intermediate step, itself justified by the one unambiguously asserted claim, 'A', it would seem that we should have to diagram it thus:

(Suppose) ^{u}D)
)
A) ---> ^{u}S ---> ^{u}V
+)
[U])

What this is intended to bring out, by omitting a plus sign between the supposition and 'A', is the fact that the argument for 'S' does not involve the supposition itself.[6]

So far, we have done little more than add apparently pedantic frills to Fisher's apparatus; little may seem to have been gained beyond somewhat greater accuracy in picturing cases such as 'Q, even if P' or any like Bacchus' above. The "real arguments" of his title do not often illustrate the oddities that constitute a good part of the philosophical discussion of conditionals. That discussion can, however, provide some instances which are illuminated by the simple proposals here.

To begin we may examine some cases Jackson (1979, p. 578) cites as apparent failures of modus tollens or contraposition. When we diagram the reasoning involved in the suppositional reconstruction of these cases we can see why they apparently fail and how the classical patterns of reasoning can still apply.

In connection with modus tollens Jackson offers two perfectly sensible conditionals that we would not be inclined to use in that argument form, given the falsity of their consequents. I shall look first at 'If he works, he will still fail.' Here I suggest the diagram (with 'W' for 'He works' and 'F' for 'He will fail') should be:

(Suppose) ^{u}W)
)
[U]) ---> ^{u}F

Here I have used the alteration suggested above of dropping the plus sign to illustrate the fact that the reasoning makes no use of the stated supposition. Here we have in fact a concessive conditional which could well have been made explicit by using 'even if'. The point is that the antecedent's truth would make no difference, the grounds for the consequent—which may well suggest that 'W' is false—are elsewhere, and remain untouched by the supposition. Since those unstated grounds are not merely supposed, one might well suggest dropping the superscripted 'u' from 'F', but as Mackie remarks of a similar case, 'F' is asserted within the supposition and its placement there is a way of indicating that while the supposition might be thought to undermine the inference it does not do so.

In this example, adding 'Not F' to the whole suppositional argument should, by the thematic analogue of modus tollens,[7] give us 'Not U' rather than 'Not W', which is as it should be.

Jackson's second example here is 'If he doesn't live in Boston, then he lives somewhere in New England,' which we can diagram as follows:

(Suppose) ^{u}Not B)
+) --> ^{u}N
[U])

I have kept the plus sign in this case since the reasoning uses 'Not B' to move to the wider and more probable conclusion 'N' from the unstated [U] which in fact gives the user reason to accept 'B'. If we again assume that we discover 'Not N', we should conclude 'Not(Not B and U)', i.e. 'B or Not U'; and since 'Not N' entails 'Not B', we are left again with 'Not U'.

Of course, to the extent that the [U] in these examples contains the evidence upon which the conditionals are based, the appropriate response might not be to infer 'Not U' but rather to reject the 'if the evidence then the conclusion' conditional (rather than the actual conditional used, as Jackson suggests). The evidence might be all correct; what we have discovered is that it was not a sufficient basis for the claims we made. There may be a residual awkwardness here because we might wish to preserve the conditional claim, either by adding some extra implicit assumptions (to

take care of odd exceptions, as Barwise (1986) seems to suggest) or by taking it as conveying something like 'If the evidence then probably the conclusion'. But either way, we would have rejected the conditional as originally understood.

In looking a little later at contraposition Jackson repeats the first of the above examples and adds a new one, which is unfortunately not a genuine example of contraposition: the premise 'if Carter is reelected, then it will not be by a large margin' versus the conclusion 'if Carter is reelected by a large margin then Carter will not be reelected.' While explanations in terms of scope may not account for all examples of odd negations (as, for instance, some of the "metalinguistic" negations discussed by Horn, 1985), that notion can certainly illuminate Jackson's error here. The issue is whether the negation applies only to the size of the margin or to Carter's reelection itself. If we may use some obvious though non-standard formalism to put adverbial modifications in brackets, the consequent of Jackson's premise is 'R(NotL)c'; but the antecedent of his conclusion is 'R(L)c', and these two are not related appropriately for contraposition. He argues from 'if Rc then R(NotL)c' to 'if R(L)c then Not(Rc)'. While 'Not(Rc)' is the negation of 'Rc', 'R(NotL)c' is not the negation of 'R(L)c'. Working back from the antecedent of his conclusion, Jackson's premise would need 'Not(R(L)c)' for its consequent where this is understood as implying 'Not(Rc)', but then the premise (and equally the conclusion) is silly: if Rc then Not(Rc). His actual premise contraposed would yield 'Not(R(NotL)c)' as antecedent of the conclusion where this is understood as implying 'Not(Rc)', which makes the conclusion true but equally silly since it would then be implicitly tautological.[8]

So, taking the conditionals in the way suggested allows us to see both why modus tollens and contraposition appear not to work at the mechanical level and that they do in fact remain valid and applicable to the reasoning embodied in their possible uses here.

The difficulties looked at so far could well be put at the door of negation rather than (or as much as) the conditional construction. Jackson, as we have seen, makes modus ponens central to his understanding of indicative conditionals, but we should note that McGee (1985) has argued that modus ponens itself needs qualification in those cases where we have a conditional with a consequent that is itself a conditional. His clearest example involves polling data for an election in which there are only three candidates: Reagan, Anderson (both Republican) and Carter (Democrat). The polls put Reagan well in front, followed by Carter, followed way behind by Anderson. We are then offered the argument:

> If it's a Republican, then if it's not Reagan then it's Anderson;
> It is a Republican;
> so if it's not Reagan then it's Anderson.

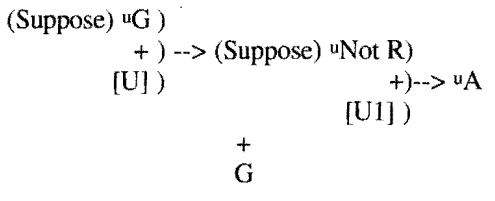
Two responses have been: (i) "modus ponens preserves truth, not grounds for believing or probabilities" and (ii) "the probability of a conditional must not be confused with a conditional probability" (Sinnott-Armstrong *et al.*, 1986, p. 300). With respect to the first, I sympathize with Davis' impatience with being told merely that certain things are indeterminate, pointless or misleading to assert when they are, if true or false at all, simply false (Davis, 1979, p. 550-1). Of course, if the conclusion is interpreted as a material implication it is, in the circumstances, true, since it amounts to 'either it's Reagan or it's Anderson'; and in a natural deduction system that marks the assumptions upon which statements depend, then it would be seen to depend crucially on the second premise, among others, with respect to which it is sensibly assertible. But clearly, no one would normally interpret it as a material implication, and our interest in using inferences is to be able to detach our

conclusions from their specific argumentative context. The second reply may also be correct, but given the wide appeal of Adams' thesis that the assertibility of simple conditionals is given by the associated conditional probability it may be worth exploring again to see if other approaches can deal with McGee's problem. (McGee has subsequently developed a technically sophisticated account of the conditional probabilities here (1989); it is so sophisticated that I would like to find a simpler solution to the difficulties he raised. It has also been faulted by Lance, 1991.[9])

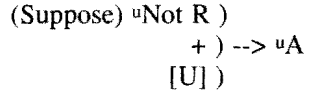
In diagramming McGee's argument it is helpful to separate out two items of background information that clearly contribute to the reasoning. I shall use 'U' as before to stand for all the unstated assumptions, and allow myself the two specified items:

> U1 = There are only these two Republicans in the contest.
> U2 = The poll data show Reagan ahead of Carter who is ahead of Anderson.

With 'G' standing for 'A Republican will win', 'R' for 'Reagan will win', 'C' for 'Carter will win' and 'A' for 'Anderson will win' the diagram for the premises would then be:



The diagram for the conclusion, reading "detached" as intended by McGee, would be:



But it is evident that no one would employ this entertained argument; given [U2] (as a part of their general acceptance of all of [U]), their assertion within the supposition that 'Not R' would obviously be 'C'.

This substantiates Over's (1988) claim there is an equivocation between the consequent of the first premise (which drops [U2]) and the conclusion (which doesn't). How does it come about? The supposition 'G' restricts [U] in the suppositional consequent of the first premise to [U1] because [U] includes [U2] which with 'G' yields 'R'; but the new supposition is precisely 'Not R', so we cannot be using [U2] from here on. But in the detached conclusion the only explicit supposition is 'Not R'; we have [U2] as a part of our relevant background knowledge, so it functions as an additional premise, making 'A' an absurd continuation. Whereas in general, [U] can include everything relevant and unaffected by the explicit supposition, what we see here is that when a supposition is made within the scope of another supposition the later [U] may have to be tailored to fit the whole sequence rather than just its own conditional.

More generally the fact that unstated additional premises are often involved in the use of conditionals can lead to apparent failures of transitivity or other forms of logical deviance in conditional reasoning. To adapt Mackie's (1980) discussion of the nursery rhyme to the effect that if the nail had not been lost the kingdom would not have been lost, one might say that the unstated supplement used in the first step, 'if the nail had not been lost, the horse would not have been lost', might well have dropped out of mind by the time we are thinking of what would have happened if the battle had not been lost. If so, the "detached" conditional, 'if the nail had not been lost, the kingdom would not have been lost' might seem unacceptable, and so transitivity would be impugned. But once we restore the full set of unstated assumptions, which we may normally take to be mutually compatible, transitivity returns. McGee's example is, however, a case where [U] supports 'R'; and as was argued above, the appearance of contradiction in the wings forces a restricted interpretation of the unstated supplement.

While the suppositional account of conditionals, supplemented as I have suggested, allows us to reveal what is going on in some of the odd uses philosophers have focussed on, the main point for informal logic is that it provides a sensitive technique for picturing the *reasoning* involved in standard argumentative uses of conditionals. We do not need to be tied down to merely reproducing the grammatical appearances; and to the extent that our aim is to portray the reasoning a person is offering we should not so restrict ourselves.

Notes

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[1] Fisher does not actually make it a requirement that conditional conclusions be given a propositional treatment, though that is how he always treats them. One might think that a conclusion must be a true or false claim while the reasons offered to support it might be allowed to include various speech acts like asserting claims within suppositions. But if such performances (or rather the acceptability of such performances) are allowed to count as reasons why should they not be supporting the acceptability of another such performance?

We may note that once suppositions à la Fisher or Mackie are allowed among the premises, the usual account of validity for deductive arguments must be revised somehow.

We may also note here the possibility that the conclusion of an argument is the rejection of another argument. This may itself be ambiguous between a refusal to endorse that argument and the suggestion that a conflicting conclusion would follow from that argument's premises (B's negative reply to A's 'P therefore Q' might either amount to 'I do not endorse the argument from P to Q' or 'P therefore not Q', cf. Richards (1969)). But if it is the former and if Fisher would let us diagram some such arguments as suppositions then why should he demur from diagramming B's conclusion as a rejected supposition?

I must admit that it is not obvious how best to diagram such conclusions, but the main point now is that they are a frequent occurrence in the sort of writing Fisher is analysing.

There is perhaps a suggestion of a reason for Fisher's practice in his remarks (p. 90) about unasserted conditionals as conclusions (concluding 'if P then Q' from reasoning to 'Q' from the supposition 'R' and another premise 'P' that might be either asserted or merely supposed). Since the reasoning to 'Q' relies on the undischarged supposition 'R', Fisher says that 'if P then Q' must remain unasserted. His style of diagramming would not easily allow him to show the whole of a conditional, understood as a supposition, as itself unasserted; but that may only be a reason to adopt a different diagram.

[2] Since preparing this paper for the second ISSA conference I have come across Barwise's (1986) discussion of conditionals in terms of "parametric constraints" anchored to the prevailing background provided by the context of language use. This seems consistent with the ideas mooted here, at least given the *bricoleur* attitude to the tools for informal logic I have advocated elsewhere (1986); Barwise, for instance, claims that rules of inference may fail when the background conditions are shifted, which is my diagnosis of McGee's examples.

[3] He claims that this construction signals the "robustness" of '(either not P or Q)' to 'P', i.e. that the (high) probability of '(either not P or Q)' is not much affected by coming to know that 'P'.

[4] I retain here the now traditional terminology, while noting the criticisms levelled at the theories typically embedded within it (Bennett (1988) based on work by Dudman). I should also acknowledge that Jackson's account is explicitly restricted to indicative conditionals.

[5] I have turned Fisher's actual diagrams through 90° and made a few other trivial changes for ease of typing. He uses capital letters for statements; superscripted 'u' to mark unasserted statements; brackets and '+' to show that statements are to be taken together; square brackets to indicate unstated components; and an arrow to represent the support offered by the premises to the conclusion.

[6] What this diagram still fails to bring out is that the supposition is not entirely irrelevant to 'V', the vexation in part arises from the differentials. Perhaps the thinking, if not the verbal expression, would be better reflected thus:

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   A )
   + ) ---> (suppose) □S )
[U1] )                  + )
          (suppose) □D ) ---> □V
                        + )
                     [U2] )
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Or perhaps 'S' is not within any supposition.

[7] I am here using the terminology offered by Geach (1979) to distinguish arguments constructed from other arguments (themata) from arguments constructed from statements (schemata).

[8] The problem can also be revealed by allowing ourselves three statements:

'C' = 'Carter is elected'
'L' = 'Carter is elected by a large margin' (which entails 'C')
'S' = 'Carter is elected by a small margin' (which entails 'C')

Here, 'Not L' = '(S or Not C)' and 'Not S' = '(L or Not C)'. The premise is 'if C then Not L' (i.e. 'if C then S or Not C', but since 'Not C' would be silly we must take this as 'if C then S'). If we contrapose what has now been understood by the premise, viz. 'if C then S', we get 'if Not S then Not C', i.e. 'if (L or Not C) then Not C'. But we cannot adopt 'L' since this repeats the silliness rejected in understanding the premise, so we are left with the tautological reading. But these adverbial modifications cry out for a more delicate treatment.

[9] Lance's diagnosis of McGee's technical error is that there may be probabilistic dependencies between distinct conditionals, including pairs whose antecedents are incompatible, which cannot be read off from the probabilities of the individual statements, because of the way conditionals operate on the basis of one's general view of the world, i.e., roughly my [U].

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