

The Narrowness of Wide-Scope Principles

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ABSTRACT: In this paper I will propose that the unpalatable consequences of narrow-scope principles are not avoided by altering the scope of the principle but by changing the kind of conditional. I argue that a counterfactual conditional should do the trick and that the rational requirement of modus ponens can be understood as something like a “Ramsey test” on this conditional.

KEYWORDS: Coherence – counterfactual conditionals – modus ponens – Ramsey test – rationality – wide and narrow scope conditionals.

1. Introduction

What does rationality demand of us?

One thing demanded of us, many philosophers think, is to avoid having attitudes that are inconsistent or incompatible. So, we will often see *modus ponens* made into the rational principle that our beliefs must be deductively closed, that is to say that if you believe p and you believe $p \rightarrow q$, then believing q complies with what rationality requires and one is rationally criticizable if one does not have this belief while having the others.¹ Obviously these principles must be conditionals. But what parts of the conditional should be inside

¹ Deductive closure is a stronger condition than is actually required to avoid logical inconsistency, sufficient for which is the weaker condition that if you believe p and you

the scope of rationality's demands? And what kind of conditional should they be?

2. The Scope of the Conditional

2.1. *Modus ponens as a narrow-scope material conditional*

A straightforward formalization of *modus ponens* gives a rational principle something like this:

$$B(p) \wedge B(p \rightarrow q) \rightarrow \text{rationality requires } B(q)$$

This is called “narrow-scope” because the scope of the propositional operator “rationality requires” is the consequent. What the conditional says, in words, is that if you believe p and you believe $p \rightarrow q$ then the consequent can be detached that says you are rationally required to believe q . Because it tells you that on the basis of the antecedent you should have a particular belief, or that you should draw a particular inference, this is called in the literature a *process-condition*. A process-condition tells you to reason in a certain, determinate way.

However, this seems to have counter-intuitive consequences in cases where it is not rational to believe p or to believe $p \rightarrow q$. Suppose that p is ‘The moon is made of cheese’ and q is ‘The moon is made of a dairy product’. According to the principle, believing that the moon is made of a dairy product complies with the rational requirement and not believing that the moon is made of a dairy product violates the rational requirement, yet this is counter-intuitive

believe $p \rightarrow q$, then you comply with what rationality requires as long as you do not believe $\neg q$. Sometimes the principle is modified so that believing q complies with what rationality requires only when you care whether q or the necessity of q given p is sufficiently obvious. I do not intend to take any position on whether rationality demands something as strong as deductive closure of belief or whether something slightly weaker is required. Nor do I wish to engage the vexed issue of the normativity of rational requirements. The issue I wish to take up is over the formulation of these principles of rationality, and for this purpose the more straightforward principle will serve as illustration, and the approach I propose can be adapted to whatever principle of *modus ponens* is correct. Ultimately, my approach should extend to other principles as well, including those of practical rationality.

in three ways: 1) It is not rational (even if we changed the example so that q was actually true); 2) Surely we cannot somehow make it rational just by having beliefs that satisfy the antecedent of this conditional;² 3) It seems consistent that it could be believed by the subject herself that the beliefs that satisfy the antecedent of this conditional are not rational, and yet believing the consequent will still come out as complying with what is rationally required.

Perhaps it might be argued that (1) is actually false, that subjectively, if she is aiming at complying with what rationality requires of her, then assuming that pursuing this aim provides her a reason to modify her beliefs in order to attain that aim (i.e., logically consistent beliefs), she should believe that the moon is made of a dairy product, rationality being a constraint only on attitudes' consistency and coherence with each other and not on how they fit the world.

I think I can afford to be agnostic on this since it would not affect the problem I want to focus on which is (3), which is precisely that in some cases complying with the principle involves being *consciously* irrational. Aiming at logically consistent beliefs provides the reasoner with a reason not only to believe a proposition that is irrational and unjustified, but a reason to believe a proposition *she knows to be* irrational and unjustified. Paradoxically, rationality seems to require us to have beliefs we know to be irrational, and says that we are being irrational if we do not have such beliefs. Suppose that our reasoner's belief that the moon is made of cheese is one she simply cannot shake, despite the fact that she knows that she has no good reason for it and that she is not justified in having this belief. Since she knows this, she knows also that the proposition 'The moon is made of cheese' is not safe for use as a premise and hence that any consequences she infers on its basis will be likewise unjustified (although they may conceivably be true). Yet the principle implies that she complies with what rationality requires in believing these unjustified consequences even while knowing them to be unjustified, that to comply with what rationality requires involves consciously putting herself into a worse epistemic position than she is in now, and she is rationally criticizable if she does not.

² As Broome (1999, 402-403) has pointed out, $B(p) \wedge B(p \rightarrow p) \rightarrow$ rationality requires $B(p)$ also fits the pattern of this principle, yet its implausible consequence is that we are rationally required to have whatever beliefs we actually have, or equivalently that our actual beliefs are infallibly those that we are rationally required to have. This objection is usually made in terms of reasons; having something as a belief cannot give you a reason to believe that it is true unless there is already a reason to believe it is true.

This is the main problem I wish to solve, and I do not see how the scope of the conditional affects the matter, having formulated the problem in such a way that it is actually neutral with respect to the scope of the rational requirement (as will become clear in a moment).

Also, with regards to (2) it is not simply a matter of whether the belief in the antecedent is rational or not. Let us suppose that this belief is rational and that there are objective reasons for it, but that the belief is not based on those reasons. To simplify, suppose that the belief is innate, imprinted at birth, and although the reasoner may come to learn of reasons that justify her having this belief, she would have it anyway, and if she came to learn of reasons that justify her dropping this belief, she would not do so. Should a principle like *modus ponens* make believing the consequences of such a belief the only way of complying with what is rationally required?

Until she grasps the relation between the belief and the reasons that justify it, I think the intuition is that she would not be rational in this case – the risk of propagating false beliefs is too great, even though in the particular case the innate belief is true and so would be all of its consequences.

Intuition is less clear after she does grasp the relation between the belief and the reasons that justify it, although her belief does not actually depend on the reasons in any way; that is to say, she is justified and knows herself to be justified in having the innate belief. Here, she improves her epistemic situation by following the principle, and that seems a good reason to say that the principle should be formulated in a way so that it does apply in this situation, in spite of the belief's questionable historical credentials. The moral is that even if we have the right attitudes we are not being rational if we fail to be aware of the normative relations between them.³ This is a fairly weak historical condition,

³ See Brunero (2005, 8) for discussion of the claim that coherence conditions, because they concern only combinations of attitudes, wrongly ignore whether any particular attitude was formed in a rational manner. In suggesting that attitudes not formed in a rational manner are not themselves rational, I am not necessarily saying that they are irrational; I am saying that coming to have these attitudes was not an exercise in rationality. They are non-rational.

I am not sure that this scenario is accurately described, since it assumes that once we have a belief with a particular propositional content then any reasons we may have or acquire for believing that content to be true must be linked to that particular belief-token or not be linked at all. I am inclined to think that in grasping the relation between the belief and the reasons that justify it one does *ipso facto* have a belief-token with that

because being aware of normative relations is not to say that our belief-formation processes are responsive to these normative relations.

On the other hand, the following claim also seems intuitive:

No Rationality Without Autonomy: S must be *autonomous* towards her attitudes in order for them to count as being held rationally.

In other words, if I were going to believe q anyway irrespective of other things I believed, then my believing q is not an exercise of rationality – something I have come to believe by trying to comply with what rationality demands of me or by a process of reasoning that ensures this compliance (whether one is reflectively aware of this or not) – even if it is correctly supported and coherent with other things I rationally believe. Perhaps we could even say that it violates something like the Principle of Conditional Non-Contradiction,⁴ since it seems

content based/depending on those reasons, although this will be a different token from (in our hypothetical case) the innate belief. In short, we can have more than one token with the same propositional content.

⁴ Aristotle actually argues for something like this (sometimes called “Aristotle’s Thesis”) as a principle of logic on the grounds that he finds its consequence $p \rightarrow \neg p$ absurd. However, unlike $p \wedge \neg p$, $p \rightarrow \neg p$ does not actually violate the Law of Non-Contradiction, and some logical proofs actually use it. Modern logic, therefore, rejects “Aristotle’s Thesis” as a principle of logic. It is possible, though it must be investigated further, that it may be resurrected as a principle of rationality, and if so, this might be a way of formally capturing the idea of being non-autonomous with respect to a proposition. However, we must be careful because logically true propositions and any theorem of the logical language will satisfy the condition of being true both when any other proposition is true and false, and our believing it as a logical truth seems to be captured by a condition like this; i.e. our believing a logical truth when knowing it to be a logical truth should always be rational whatever else we believe, so satisfying the conditional in this circumstance implies rationality rather than irrationality. On the other hand, it may not be the case that we would believe a logical truth whatever else we believe, even if we believe it to be a logical truth. For instance, we may believe a logical truth because we believe that we have a proof of it, and would not believe it had we no such proof (or belief that there was such a proof); furthermore, if we did believe it in the absence of belief in a proof, this belief would, I think, be irrational. The proof of the theorem is not the kind of thing whose truth or falsity is immaterial to the truth of the logical truth or the rationality of believing the logical truth. These are complications that would have to be worked out; theorems do not, I think, get their being rational for free, despite the impossibility of their being false.

to imply that $B(\Gamma) \rightarrow B(p)$ and $B(\neg\Gamma) \rightarrow B(p)$, since $B(p)$ would be true whatever else I believe, even if the Γ that I actually base my belief that p on does actually support p and I am quite unaware of the fact that I would believe that p even if I believed that Γ was false.⁵ Since I do not say that $B(\neg\Gamma)$ is true – that I actually have this belief, or for that matter that I believe either of the conditionals – the attitudes need not be actually inconsistent, but the mere danger that they could be seems reason enough for caution.

There are various accounts of autonomy available, but the one I wish to appeal to here is from Mele (1995), where being autonomous toward an attitude is for it to be *sheddable*, where an attitude is sheddable provided that it results from our psychological processes operating in the normal way and could in principle be shed by their continued operation in the normal way. An attitude that we have been psychologically compelled to have by the intervention of something exogenous to the normal operation of our belief-forming processes, or more simply because of their temporarily abnormal operation, and that we have no control over (the hackneyed examples being hypnosis and brain-washing) will be practically unsheddable. Practically unsheddable attitudes are held non-rationally.

Does this mean that rational requirements should be formulated in such a way that believing the consequences of such an unsheddable belief should not count as complying with them? If so, this is a stronger historical condition than that described above, because it says that the normative relations must not simply be grasped in the particular case but must actually guide our belief-

⁵ Suppose that I believe that I was immaculately conceived, and base this on the belief that I do not have a biological father; that is to say, I believe the conditional ‘If I do not have a biological father, then I was immaculately conceived.’ These beliefs would be consistent, and my belief that I was immaculately conceived would be justified (both propositionally and doxastically) by my belief that I do not have a biological father. But let us suppose, contrary-to-fact, that even if I believed that I do have a biological father, I would still believe that I was immaculately conceived (I am just that kind of guy). In this possible world, I would be prepared to countenance both conditional beliefs ‘If I do not have a biological father, then I was immaculately conceived’ and ‘If I do have a biological father, then I was immaculately conceived’ rather than give up the belief that I was immaculately conceived. From this I conclude that the belief that I was immaculately conceived is not rational in the actual world either; although this belief is justified it is not rational because it is not responsive to the belief it was justified by in relevant counterfactual situations.

formation processes. The intuition is unclear, because there is a sense in which the attitude is rational and a sense in which it is not.

2.2. *Modus ponens as a wide-scope material conditional*

Objections (1) and (2) are well-known and have led many to a wide-scope formulation of the rational principles that contrasts with the narrow-scope formulation given above. Thus, the rational principle should be something like this:

Rationality requires $[B(p) \wedge B(p \rightarrow q)] \rightarrow B(q)$

This is called “wide-scope” because the scope of the propositional operator “rationality requires” is the conditional as a whole. What the conditional says, in words, is that what is rationally required is to make the conditional itself true, and this can be done in two ways: by ceasing to have one of the beliefs referred to in the antecedent or by having the belief referred to in the consequent. It does not tell you that you should or should not have a particular belief, or that you should draw a particular inference, or that you should reason in a certain, determinate way, because although it is still true that you have a reason to make the conditional true, reasoning itself is not given a determinate direction in that the principle does not tell the reasoner *how* to make the conditional true. It is not a *process-condition* but a *state-condition*: it proscribes being in a state where there is a certain combination of attitudes which would constitute a counter-interpretation of the logical principle, which in this case is a state where I believe that p and $p \rightarrow q$ are true while also believing that q is false. What rationality requires through these principles is avoiding such combinations, i.e., attitudes (in this case, beliefs) that are incoherent. Satisfying the conditional avoids any such combination, but rationality judges symmetrically with regards to how the conditional is satisfied and is thus agnostic towards how the particular combination is best avoided.

The cause of the implausible consequences of the narrow-scope formulation is held to be the fact that the scope of what ‘rationality requires’ is the consequent of the conditional. By changing the scope to the conditional as a whole we avoid these consequences. For example, the wide-scope conditional does not have the consequence that rationality requires us to believe that the moon is made of a dairy product because we can obey this principle by dropping the irrational belief that the moon is made of cheese. Unlike the narrow-

scope formulation, the consequent does not detach, so it is not the case that rationality requires that I believe q , though it is true that in believing q I would be complying with what rationality requires. Thus, for the wide-scope it is strictly speaking incorrect to say that rationality requires us to have any particular belief – this is why I have tended to use the rather tortuous expression of a belief's complying with what rationality requires rather than simply that rationality requires having that belief, and although when discussing the narrow-scope formulation I could have used the simpler expression, my reason for not doing so was in order to formulate the problem in a way that did not depend on a wide or narrow-scope reading of the conditional. For the wide-scope, there is more than one way of complying with what rationality requires; the point of having rationality require us to be such that the conditional is true is that there is more than one way of making the conditional true – we can make the consequent true (which is what the narrow-scope principle endorses exclusively) or we can make the antecedent false by dropping the antecedent beliefs.

Superficially this solution is attractive and the wide-scope view seems to avoid the consequences of the narrow-scope view. But does it really? Are there not at least some circumstances under which there is after all only one way to comply with what rationality requires, that is to say, only one way psychologically and/or physically open to us to make the conditional true? There are a number of ways we might imagine this happening that have turned up in the literature. In fact, even our earlier example seems to say that the only rational way to satisfy the conditional is to drop the irrational belief that p given that the belief that q is irrational. To make the case stronger we may suppose that we believe that believing q would be irrational. It seems then that the only way to be rational is by not having the belief that p .

In the last case, dropping the belief that p was the right way to comply with what rationality requires, so perhaps it might be thought that the complaint that it is the only way open to us to be rational is of little consequence. Of course, the problem is exacerbated when not believing that p is the *wrong* way to be rational. Suppose that we are doxastically akratic and believe that believing q is the right way to comply with what rationality requires, but for some reason cannot bring ourselves to believe that q ; belief that q is not a psychologically open possibility for us. Again, the only way that we can actually comply with what rationality requires (at least, on purpose – this is an important qualification that will be discussed later) in these circumstances is by making the

antecedent false, that is to say, by dropping beliefs that we may rationally have and quite likely believe ourselves rationally to have, but this is to make akrasia a rationally principled response to the situation we find ourselves in, yet surely akrasia is a paradigm case of irrationality. At the very least, principles of rationality should not provide the akratic with reasons to behave akratically. Supposing that it is psychologically open for the akratic simply not to comply with the rational principle (e.g., by just staying in the state he is now), then it seems that this is what he should rationally prefer, despite the principle's being violated.

Analogous arguments could be made for circumstances where we are simply unable to believe that q . These are all cases where making the antecedent false seems to be the wrong thing to do, yet it is what we must do to avoid finding ourselves with an incoherent combination of attitudes, and if we have a reason to avoid such combinations (and *ex hypothesi* we do have a reason to make the wide-scope conditional itself true) then we have a reason to do the wrong thing; despite the fact that rational requirements are not themselves reasons, taking coherence (as expressed by rational requirements) as a norm does provide reasons.

Cases where the only way to comply with what rationality requires is to make the consequent true are even more common, and in these cases the wide-scope principle works out the same as the narrow-scope principle after all. In fact, if we make time a factor, this is universally the case, since until we actually make the antecedent false by dropping the irrational belief (supposing now that this is psychologically and physically open to us) we are still in a situation where the only way to make the conditional true is to make the consequent true.⁶ As before, if dropping the irrationally or non-rationally held belief is not psychologically and physically open to us (e.g., if they are unsheddable) then the only way (purposely) to comply with what rationality requires is by making

⁶ This way of pressing the general objection comes from Schroeder (2009, 227) who remarks that 'it follows that people are in general infallible about what they ought to do, as long as they do not try to change their minds'. Note also that the reconstruction of Broome's first-order model of practical reasoning in Bratman (2009, 14) has as a crucial premise: 'If you also believe that E only if M, and if these beliefs do not change, BC requires that you believe M; and that is where your reasoning can lead.' Even here it seems to be the mere fact of beliefs' not changing that seems to lead the reasoning one way rather than another, but if it did not do this it is questionable whether we could achieve any of our cognitive ends through reasoning alone.

the consequent true.⁷ We have not solved the problem that the wide-scope principle was introduced to solve.

Perhaps it might be objected that the only thing that counts is that it is logically possible to make the conditional true in the right way, irrespective of whether it is psychologically or physically possible; the fact that we cannot do something does not alter the fact that it is what it would be rationally and epistemically best to do. But this still leaves the reasoner in a dilemma: there is an option he can take that would result in his complying with what rationality requires insofar as it would result in his attitudes going from a state where they are incoherent to a state where they are coherent.⁸ His only other option is to leave his attitudes in a state of incoherence and thereby be irrational. Which should he rationally prefer? When coherence can only be purchased at the price of believing further falsehoods or the logical consequences of beliefs that are irrational and quite possibly believed to be irrational, I think it is plausible to think that he should leave his attitudes as they are, inconsistency notwithstanding. On the other hand, whoever consciously holds inconsistent attitudes seems to be rationally criticizable in a distinctive way, and it seems distinctly odd to give as an excuse: ‘Well, what I actually wanted to do was to stop believing that the moon was made of cheese, but I couldn’t.’

So far I have argued that wide-scope principles do not avoid the consequence that only one way of purposely complying with it is rational, and further that this way will often be the wrong way of complying with the principle

⁷ Even the wide-scope formulation is subject to the kind of detachment that is called necessary detachment. Necessary detachment says that if p then q , and necessarily p , then if rationally required p then rationally required q . If we treat unsheddable beliefs as being necessary in the relevant sense, then we will detach as if the requirements were narrow scope. I owe this observation to an anonymous reviewer of *Organon F*. However, I am not convinced that unsheddable beliefs are necessary in the relevant sense. We must distinguish between detaching $B(q)$ and detaching rationally required $B(q)$. Narrow-scope formulations and necessary detachment detach rationally required $B(q)$, whereas in the scenario described it is only $B(q)$ that is detached. However, this is enough to create the problem. See the later discussion of Hussain’s view.

⁸ To make the incoherence more marked we may suppose that the subject actually believes the negation of the consequence, e.g., that the moon is not made of a dairy product. This makes the subject’s belief set logically inconsistent and both the strong (deductive closure) version of modus ponens and its weaker version will apply to it. And unfortunately the result on both versions will be to retract the true and rationally held belief that the moon is not made of a dairy product.

and may even be known by the subject to be the wrong way and to be irrational, and that the reason for both of these things is beliefs that the reasoner actually has simply because he actually has them, irrespective of their rationality.⁹ The wide-scope view does not seem to avoid the consequences it was expressly introduced to avoid, then, at least in certain circumstances. I do not wish to reject it completely, however, because I think that its central insight that the principles of rationality are principles prohibiting certain combinations of attitudes is correct and worth preserving, which is to say that it is still the truth of the conditional that rationality requires. Only I deny that this conditional is a material implication.

3. The type of conditional

The situation so far is that I have described a kind of scenario where reasoners would have to consciously put themselves into a worse epistemic situation than they are already in to comply with rational requirements, irrespective of whether those requirements are formulated as material conditionals with wide or narrow scope. This problem, at least, is not solved by altering the scope of the material conditional. The aim in this section is to investigate whether the problem is the conditional's being a material conditional rather than some other type.

In the first part I will note that originally Broome did not actually use a purely material conditional but what I will call, for want of a better name, a "quasi-material" conditional. This is defended in the work of Hussain (2007),

⁹ Way (2010, 224-225) argues further that wide-scope principles do not avoid the consequence that we have *reasons* to obey the principle in a particular way. Although the wide-scope view avoids the consequence that any particular way of making the conditional true is required, making the conditional true is itself something that is required and plausibly something that we have a reason to do. It is plausible to suppose that if we have a reason to do something then we have at least some reason to do whatever is necessary and/or sufficient for doing it, or on a slightly different principle, whatever is a means to doing it. Since we have a reason to make the conditional true and, trivially, each way of making it true is sufficient for making it true, it follows that there is a reason to make oneself rational in *both* ways, and this is so simply because of attitudes we actually have regardless of whether they are rational or whether we have reasons to have them. Way calls this the *transmission problem*. I will not be dealing with this problem in this paper.

whose views will be discussed in some detail. It will be shown that he does not avoid the problem described above.

In the second part I will make tentative inroads into formulating the principles of rationality as counterfactual conditionals. Probably, this should be qualified as “quasi” too, for the conditional is not quite the classical counterfactual conditional, and the Ramsey test that I propose to use to evaluate the counterfactual is not quite the classical Ramsey test. All that I wish to present here is a basic approach to the problem.

3.1. Modus ponens as a wide-scope quasi-material conditional

It is interesting to note Broome’s own attitude towards the conditional. In an early paper Broome (1999, 401-402) says that the relation he calls a rational requirement is not a material conditional but something like a material conditional with determination added where this determination is ‘roughly analogous to causation’ (Broome 1999, 401). This contrasts with a presentation of the wide-scope principle as something like ‘It is rationally required that (you do not believe the antecedent or you do believe the consequent)’ where the disjuncts are offered as the rational options for making the conditional true. Yet in Broome (2007) he says:

When a wide-scope requirement holds, what is required of you is a material conditional proposition $p \varepsilon q$. We must be able to substitute logical equivalents within the scope of a requirement. So rationality also requires of you the contrapositive $\neg q \varepsilon \neg p$. Wide-scope requirements have this sort of symmetry.

But sometimes this symmetry seems wrong. Look at the wide-scope formulation of the anti-akratic requirement ...

Rationality requires of you that (You believe you ought to $F \varepsilon$ You intend to F).

Contraposing gives:

Rationality requires of you that (You do not intend to $F \varepsilon$ You do not believe you ought to F).

But the relation between believing you ought to F and intending to F is not symmetric

... [It would be] irrational to disbelieve you ought to F because you do not intend to F . (Broome 2007, 35-36)

Here Broome seems to be saying that the wide-scope principle in question (admittedly not *modus ponens*) is a material conditional after all and as such it contraposes, and explains away the apparent irrationality of, for instance, being rational by akratically modifying one's beliefs in line with one's intentions, as the failure of a material conditional to capture a relation of explanation or grounding. Broome changed his mind in the intervening years: his later position seems to be that it is not the role of the principle to capture this relation, whether we call it determination, explanation or grounding. To capture this relation is not a matter of scope but a matter of the type of conditional (cf. Broome 2007, 36). This goes equally for non-instrumental principles: *modus ponens* contraposes into a principle where from *not* having a belief one reasons to *not* having other beliefs,¹⁰ and it is not obvious that it is even possible to reason from the lack of a belief. It is nonetheless true that one would be complying with what rationality requires if one satisfied this conditional, so Broome could maintain that this is in fact a rational requirement even if it was one that could not be satisfied by reasoning. But, because the material conditional does not capture the relation of grounding, one could not say that one would be in this situation *because* one does not believe that *q*, or that it is rational to intend to *F* *because* one ought to *F*, irrespective of whether the principle is wide-scope or narrow-scope. A principle that resolved this asymmetry properly could not be a material conditional, and Broome (2007, 37) briefly suggests as an alternative a conditional that does not contrapose.

We are here considering three possibilities: two alternative readings of the wide-scope principle as an ordinary material conditional and as a material conditional with determination added, and as an as yet unspecified conditional that does not contrapose. I will later be suggesting a way of making good on this third alternative that Broome (2007) cursorily passes over, but first I want to

¹⁰ At first glance contraposition seems reasonable for *modus ponens* and not to have the kind of problematic asymmetry that arise for instrumental principles; after all, if the consequent is false then the antecedent must be false. However, it should be remembered that the antecedent and consequent in this case are the beliefs and not the propositions believed; what you get when you contrapose the rational principle *modus ponens* is not the rational principle *modus tollens* which is:

Rationality requires $(B(\neg q) \rightarrow [B(\neg p) \vee B(\neg(p \rightarrow q))])$

but the much more peculiar:

Rationality requires $(\neg B(q) \rightarrow [\neg B(p) \vee \neg B(p \rightarrow q)])$.

note that even when a condition ‘roughly analogous to causation’ is appended to the material conditional, we still face the counter-intuitive result that in order to comply with what is rationally required a reasoner may need to consciously put himself into a worse epistemic situation that he is already in. This will motivate serious consideration of the third alternative, for which I will make some preliminary proposals.

The early way of reading the conditional as a material conditional with determination added is defended in Hussain (2007, 42-45) who denies that adding determination amounts to a narrowing of the wide-scope principle on the grounds that the important point is that the conditional nonetheless does not license detachment, and it is detachment that causes the problem, not the direction of reasoning as such. That you cannot, for instance, drop the belief that is held irrationally or believed to be held irrationally, does not, Hussain seems to say, imply that you are rationally required to believe its equally irrational consequence, even though this is in fact the only way open to you in which you can comply with what rationality requires, for this is a matter of detaching the consequent of a wide-scope principle as you would of a narrow-scope principle, and this detachment is not valid.

On this subject (in a context other than *modus ponens*) he makes a number of interesting comments:

Consider the matter from the third person perspective of someone assessing *S*'s rationality and assessing what mental states *S* ought to have. To keep things simple, consider the case where not only is *S*'s belief [that *S* lacks sufficient reason to *X*] false, but in fact there is conclusive reason to *X* and so *S* ought to intend to *X*. The assessor can still think that rationality requires someone in *S*'s situation to get rid of the intention to *X*. Of course, the assessor doesn't think *S* should be in that situation and so doesn't think that *S* ought not to intend to *X*. Wide-scope is precisely what allows the assessor to think these thoughts without contradicting herself. (Hussain 2007, 43)

S seems to have got herself into a situation where the only way open to her to comply with what rationality requires is to make the consequent true despite the fact that in some sense what she should do is not be in that situation in the first place; her being in that situation indicates that somewhere in the past she formed a belief irrationally (or non-rationally). Hussain seems to be saying here that the wide-scope principle's result that complying with what rationality

requires by making the consequent true holds even in cases where the antecedent cannot be made false.

He goes on:

But if there is only one way of responding by reasoning to what is wrong with me, then does that not mean that I am rationally required to take that way? Well, given the situation I find myself in ... there is only [one] way for me to proceed by reasoning. Rationality requires me to reason in a certain way, but rationality doesn't require me to be in the situation I am in: it does not require me to have the belief that I lack sufficient reason to X. That belief is not, so to speak, rationality's responsibility and neither, therefore, is the result that the only way for me to proceed by reasoning is not to have the intention to X. Things could have been otherwise without violating the rational requirements and they could still be otherwise.

... [T]here are two ways of rationally resolving the conflict. The agent cannot change the belief by reasoning and thus things couldn't be otherwise by reasoning, but it still does not follow that what rationality requires is not to intend to X; i.e., that we can detach the conclusion that rationally requires that I not intend to X. What rationality requires is a specific process of reasoning in certain circumstances. One can engage in that process of reasoning or one can change the circumstances, though, sometimes, not by reasoning. It does not follow that rationality requires the particular outcome to the process that would result if the circumstances were not changed. This becomes clear when we see that if one were to change the circumstances – again not necessarily by reasoning – one would not be violating the requirement, indeed, one would now make it the case that one was living up to the requirement. Imagine ... that I just, somehow, forget the content of the belief – I no longer have that belief. Now I would be back in conformity with the requirement, but not by reasoning. This is a way of ending up in accord with the requirement though not a way of coming into accord that I could manage by reasoning. The requirement directs me to reason in certain ways in certain circumstances. But removing those circumstances is one way for me to have the requirement no longer apply to me. (Hussain 2007, 44-45).

Principles of rationality are for Hussain principles for reasoning in the correct way, and if we cannot by reasoning make the antecedent of the conditional false then we are rationally required to engage in reasoning that, as it happens, makes the consequent true, and if we cannot by reasoning make the antecedent

of the conditional false then this amounts to saying that this is not psychologically open for us. Our beliefs regain coherence if the antecedent becomes false of its own accord, but that is nothing to do with us or with rationality as such.

Hussain is trying to have his cake and eat it. In saying that “[w]hat rationality requires is a specific process of reasoning” he is trying to use the wide-scope quasi-material conditional as a process-condition in that, although it does not tell you that some belief is rationally required, it does provide a direction of reasoning. Narrow-scope principles are process-conditions because, by virtue of detaching their consequents, they tell you what to think or at least what it would be rational to think, but wide-scope conditionals are not generally thought of as process-conditions but as state-conditions. How exactly does Hussain make it into a process-condition, then?

Some background is necessary to answer this question. To a large extent, the dispute between the wide-scopers and the narrow-scopers is a dispute over whether the principles of rationality are state-conditions or process-conditions. This is a main bone of contention between Kolodny and Broome. Kolodny (2005) argues that “for any rational requirement on you, there must be a process of reasoning through which you can bring yourself to satisfy that requirement.” Broome (2006, 2) quite explicitly rejects Kolodny’s arguments for this view, expressing agnosticism towards its conclusion, and in Broome (2009, 18) we see why, for he says that reasoning cannot always bring you to satisfy a certain putative principle and that in that situation we are in a dilemma of concluding either that the principle “is not a genuine requirement of rationality, or alternatively that it is a genuine requirement but not one that reasoning can always bring you to satisfy.” Ultimately Broome seems to prefer the latter horn of this dilemma.

Hussain seems to want to steer a middle course. He says that “[r]ationality requires me to reason in a certain way,” apparently in agreement with Kolodny, and where “there is only [one] way for me to proceed by reasoning” Hussain says that rationality requires me to reason in that way. He also seems to accept something similar to Broome’s point against Kolodny that not every way of satisfying a wide-scope principle (i.e., each way of making the conditional true) is such that it can be satisfied by reasoning. Where there is one way of satisfying the principle that can be reached by reasoning and one that cannot be so reached Hussain is clear that what rationality requires is to satisfy the principle by reasoning. This rationally required reasoning has a definite direction as indicated by the “added determination” in the conditional, and the result

of this reasoning is the consequent of the wide-scope conditional. On Hussain's view of the quasi-material conditional, then, by complying with what rationality requires we will end up with the consequent; in effect (if not formally), we may detach the consequent. It is, then, a process-condition in this sense. This does not, however, make it equivalent to the narrow-scope principle. Detaching the consequent is rationally required and the destination to which rationally required reasoning leads us, but actually believing the detached belief is not rationally required; what is detached is the belief itself, whereas in the narrow-scope view¹¹ (and this is how Hussain's view differs from the narrow-scope view) what is detached is not the belief itself but the belief's being rationally required. So, we avoid the problem of being rationally required to have beliefs when the beliefs in the antecedent of the conditional are not themselves rational; for example, we are not rationally required to believe that the moon is made of a dairy product. But we are, it is implied, rationally required to draw this belief as an inference, at least if this is the only way to proceed by reasoning (and probably also if it is not, for the conditional's "added determination" already seems to give it that direction).

Apply this to our case. Despite Hussain's acceptance that an assessor could judge that the subject ought not to have the irrational or unsheddable belief that is the cause of the problem and in that sense the subject ought not to believe what follows from it, the subject is rationally required to engage in reasoning (and this is what makes it a process-condition) which results in believing whatever follows from it. Hussain (2007, 44) says also that there is no inconsistency for the subject: believing $\{p, p \rightarrow q\}$ and assuming that these beliefs do not change, then she must believe q . Note that the way I formulated the problem, by saying that complying with what rationality requires can lead one to have irrational beliefs, applies equally to Hussain's view. Believing q , it is true, is not rationally required, just as it was not rationally required in the ordinary wide-scope view, yet it is still the only way by reasoning and on purpose that we may comply with the rational principle and make our attitudes coherent. The belief that q is sufficient to cause the problem, so drawing a distinction between detaching the belief and detaching the belief's being rationally required does no good here.

¹¹ Similarly for the wide-scope view when there is necessary detachment. This is why I think there is a disanalogy between necessary detachment and the problem described here.

I will argue that it is implausible that a reasoner should be rationally required to reason as Hussain claims, at least in the case where the subject not only has a belief that is held non-rationally but is conscious of this fact and of the fact that this realizes a disvalue for her, as we supposed in objection (3) above and the ensuing discussion. Assuming that these beliefs do not change, a subject in this situation is incoherent whatever she does, whether she believes *q* or not. The subject's belief that she has an irrational belief is a second-order belief about her first-order belief with evaluative content. It does not seem too much of a stretch to suppose that she also has some second-order beliefs about various combinations (whether particular combinations or general patterns of combination) of the irrational belief with other beliefs. Some combinations (e.g., believing the logical consequences of the irrational belief) will increase the number of irrational beliefs, and so presumably the evaluation here will also be negative. However, some of these combinations seem to be rationally required, and it does not seem impossible that she has second-order beliefs about this as well. By complying with the rational requirement the subject consciously puts herself in an even worse position than before; in fact, the combinations that put her into these positions are precisely those that avoid incoherence. If it is nevertheless the case that she believes that she should do as she is rationally required, it must be because she believes that in this particular case coherence has a value of its own that outweighs the disvalue of holding and propagating irrational beliefs. It will not do to simply say that avoiding incoherence is a valuable disposition to have for this will not explain her decision or why the rational requirement applies in this particular case. I find this belief about the value of coherence somewhat implausible and would question whether this belief is itself a rational one; if satisfying the consequent is the only way you can satisfy the conditional by reasoning, then there is no reason or value in proceeding by reasoning in this particular case, and the subject will know this. So, I do not agree with Hussain's claim that rationality should require us to engage in the kind of reasoning he is talking about. Reasoning may be a useful disposition to have, but it is not one we ought to manifest in cases when we know that by doing so we are only making our epistemic situation worse. What is more, it seems that this is where reasoning itself can take us; we can reason (on the basis of evaluative beliefs about our first-order beliefs) that we would do better by not reasoning (on the basis of first-order beliefs). The correct thing to do is to leave oneself in the incoherent state after all, contrary to what Hussain says.

3.2. *Modus ponens as a counterfactual conditional*

Since the wide-scope conditional seems to endorse the view that in these cases rationality requires one to consciously form beliefs that one knows will increase the overall irrationality of one's set of beliefs, it cannot be correct. We need another kind of conditional. The counterfactual conditional does not contrapose or detach and seems to instantiate the kind of causal and grounding relation that Broome talks about. I will now sketch an account of a principle of rationality using counterfactual conditionals.

According to the Ramsey test for the truth of counterfactual conditionals, the open counterfactual conditional $p > q$ is true if adding p to a body of knowledge would, after minimal adjustments to preserve consistency, result in q belonging to a body of knowledge. That is to say, to add $p > q$ to the body of knowledge is to commit oneself to adding q to the body of knowledge should it come about that p is in the body of knowledge. This means that if $p > q$ already belongs to the body of knowledge, the preservation of consistency dictates that if p came to belong to the body of knowledge then so also would q , or else $p > q$ would be false. This derives something similar to the logical (not rational) principle of *modus ponens* for counterfactual conditionals from the Ramsey test something like

$$B(p > q) \rightarrow [B(p) \rightarrow B(q)]$$

The antecedent is the knowledge base. It is important to understand that what this is telling us is what must be the case when the counterfactual conditional is true; it is not telling us what beliefs to have – all references to beliefs are to be understood subjunctively as a test on the truth of the conditional, including the reference to belief in the counterfactual conditional.

What we want is a principle where it is a material conditional that one has a prior belief in and a counterfactual conditional that one is required to make true, e.g.,

$$B(p \rightarrow q) \rightarrow O[B(p) > B(q)]$$

This is a kind of intermediate-scope conditional¹² and seems to put the grounding in the right place – we want to be able to say that we ought to be such that

¹² See Way (2011) for another example of intermediate-scope conditionals.

our belief that q is grounded on our belief that p . Unfortunately, however, the principle does not say this – note that since the truth of the counterfactual conditional $p > q$ meant that $B(p) \rightarrow B(q)$, the truth of the counterfactual relation between *belief* that p and the *belief* that q that is here in the scope of the ought-operator (i.e., $B(p) > B(q)$) means a relation of material implication between the belief that the subject believes that p and the belief that the subject believes that q (i.e., $B(B(p)) \rightarrow B(B(q))$); the body of knowledge after the revision would be $\{p \rightarrow q, B(p), B(q)\}$, or in other words $B(p \rightarrow q)$, $B(B(p))$, and $B(B(q))$.

So, this principle does not give us what we want, which is a relation between $B(p)$ and $B(q)$ rather than a relation between $B(B(p))$ and $B(B(q))$. More importantly, the principle is not valid: $B(B(q))$ does not follow from $B(p \rightarrow q)$ and $B(B(p))$ because the former is a conditional concerning the contents of belief and the latter a second-order belief. We can cope with this in two stages.

First, we must be able to convert the second-order belief that p to a first-order belief, giving a principle more like

$$\{B(B(p)) \rightarrow B(p), p \rightarrow q\} \rightarrow (B(p) > B(q))$$

If we add $B(p)$ to the body of knowledge now we will get $B(q)$ because we can get $B(B(p))$ as the first step of the Ramsey Test, $B(p)$ from $[B(B(p)) \rightarrow B(p)] \wedge B(B(p))$, and then $B(q)$ from $B(p) \wedge B(p \rightarrow q)$.

This still does not give us what we want. Although it is having $B(q)$ and not $B(B(q))$ that we ultimately want to say is rationally required in the given situation, the truth of the counterfactual $B(p) > B(q)$ requires still that $B(B(q))$ would be in the body of knowledge after the hypothetical addition of $B(p)$, and from the principle above all we know is that $B(q)$ would be in the body of knowledge.

The second stage, then, is to amend the original body of knowledge further to convert the first-order belief that q to a second-order belief that q , giving the principle

$$\{[B(q) \rightarrow B(B(q))], [B(B(p)) \rightarrow B(p)], p \rightarrow q\} \rightarrow (B(p) > B(q))$$

If we add $B(B(p))$ to the body of knowledge now we will get $B(B(q))$ because we can get $B(q)$ as previously described and then $B(B(q))$ from $B(q)$ and $B(q) \rightarrow B(B(q))$. Given these three conditionals (the knowledge base), we make the counterfactual true either by believing both p and q or believing

neither. However, later I will propose that when we also have a negative evaluative belief about our belief that p (such as that it is irrational or unsheddable), the counterfactual can be evaluated in such a way that we can make it true by not having the belief that q .

Plausibly, the only reason we should be able to convert from first-order beliefs to second-order beliefs and back again for these particular propositions is if this were so for all propositions, that is to say if $\forall p. B(B(p)) \rightarrow B(p)$ and $\forall p. B(p) \rightarrow B(B(p))$. Smullyan (1986) calls those for whom these are true *stable reasoners* and *normal reasoners* respectively. Those for whom these are not true are called *unstable reasoners* and *peculiar reasoners* respectively, and although such reasoners find themselves in a strange psychological position they are not necessarily inconsistent. I propose, then, that the following principle be restricted to *stable* and *normal reasoners*:

MODUS PONENS*: $B(p \rightarrow q) \rightarrow$ rationality requires $(B(p) > B(q))$

This says that stable and normal reasoners are rationally required to have beliefs such that believing q counterfactually depends on believing p if they believe that $p \rightarrow q$.¹³ If you comply with MODUS PONENS*, then if you believe that p then you will believe that q , and if it had not been the case that you believe that p then it would not have been the case that you will believe that q . However, this seems only to be true if you did not already believe that q . To avoid this, the revised principle is:

MODUS PONENS***: $(B(p \rightarrow q) \wedge \neg B(q)) \rightarrow$ rationality requires $(B(p) > B(q))$

¹³ It simplifies the Ramsey test if these universal conditionals are part of the body of knowledge, and if we insist that they must be then this restricts the principle further to those who know themselves to be *stable* and *normal reasoners*. Or it may be that the requirement is actually a requirement for everyone, but only normative for *stable* and *normal reasoners* or for those who know themselves to be so. But the ability to make these inferences in the cause of making minimal adjustments to preserve consistency in the knowledge base would perhaps be sufficient, or even it may be part of the notion of consistency in use that the knowledge base should be such that it satisfies the constraints of stability and normality.

This seems to guarantee that believing p is the cause or grounds of believing q when these states are the result of complying with the principle.

Does it solve our problems? Suppose again that our reasoner believes p and is not able not to believe p . Adding the belief that p to a knowledge base including the belief that $p \rightarrow q$, a belief that q will result for stable and normal reasoners. This is because believing that q appears to be the minimal adjustment that preserves consistency with what we believe when updated with what we have hypothetically added.

However, consider the case where we know that believing p is unsheddable and/or irrational. We will not, in this case, have a coherent knowledge base to begin with, and whatever we do – whether we believe q or not – we will not get a coherent knowledge base, as indicated earlier; although the contents of our beliefs may be logically compatible, there are certainly some among them that it is irrational to hold together, e.g., a belief B and the higher-order belief that one ought not to have belief B , and in general to have those attitudes held akratically or non-autonomously. Here we must settle for maximizing consistency, and in this case I will stipulate that it is permissible *not* to preserve in our considerations what we have hypothetically added.

In fact, this is what we are rationally required to do in this case, on the grounds that we are aware that this belief is the result of a belief-forming mechanism that is functioning abnormally, and therefore the closest possible world W in which the knowledge base is fully consistent is one where this mechanism is functioning normally. In W , the belief that q is not part of the knowledge base either. So, the belief that q still depends on the belief that p – the conditional still passes this version of the Ramsey test – because in W we have neither of these beliefs.¹⁴ Let me put it this way: normally, for $B(q)$ to depend counterfactually on $B(p)$ it must be the case that if $B(p)$ is present then $B(q)$ is present and if $B(p)$ is absent then $B(q)$ is absent. I am proposing instead that $B(q)$ can be absent in the actual world even though $B(p)$ is present, if in the

¹⁴ This may be a little hasty, because the world where the belief-forming process functions normally is not necessarily one where it does not result in the belief that p . As I said before, having bad credentials does not necessarily mean that p is false or is a belief one ought not to have if everything were working perfectly. It seems enough to say here that it is not the case that one ought to believe that p , i.e., that this belief is not one that needs to be preserved; we do not need to say that the belief that p is one that one ought not to have. That is to say, $\neg O(B(p))$ rather than $O(B(\neg p))$ or even, perhaps, $O(\neg B(p))$.

actual world the knowledge base is incoherent and in the nearest possible world in which the knowledge base is coherent $B(q)$ is absent, and this is because in that world $B(p)$ is also absent; the presence or absence of $B(q)$ in this world counterfactually depends on the presence or absence of $B(p)$ in W , since by grounding it on $B(p)$ in W one would minimize avoidable irrationality. Counterfactual dependencies between our attitudes then should depend on what is true in W – in the closest maximally coherent world – rather than in the actual world. Although we cannot shed the unsheddable belief in fact (in the actual world), it is still the case that the knowledge base where the belief's consequences are not added is more coherent than the knowledge base where they are; we cope with the unsheddable belief simply by making the truth of the conditional depend on counterfactual situations where the belief is not unsheddable and everything functions normally. Although we cannot get to W in this way (because this requires us to shed the unsheddable), we can get as close as possible to it, as coherent and consistent as it is possible for us to be, by complying with MODUS PONENS**. I will continue to talk of this as 'making a counterfactual conditional true' though I acknowledge that it is a non-standard interpretation of the phrase 'counterfactual conditional' and a non-standard version of the Ramsey test that I use to evaluate it.

This gives the right result in the case where we are aware that believing p is unsheddable and/or irrational. But what if we do not know this? There would not appear to be any inconsistency in this case, or therefore any obstacle to believing q . I admit that I am not really sure how to answer this, but one might bite the bullet: we actually should rationally prefer to believe q after all, and the reason that we have intuitions to the contrary and for accepting the No Rationality Without Autonomy claim is because when considering this scenario we are *ipso facto* in the position of knowing that the belief is unsheddable and/or irrational, and take it in the same way that we take the case above where the subject also knows this and we should not rationally prefer to believe q .

This seems to work out like a version of Schroeder's account of weak subjective reasons; the belief that p does provide a subjective reason for believing that q even if p is irrational, as long, I would add, as we are not aware of that fact. Schroeder gives the following example: you see Tom Grabit leave the library, pull out a book from under his shirt and run away. On this evidence you form what appears to be a fairly safe conclusion that Tom has stolen a book. Suppose now that you learn that Tom is indistinguishable from his identical twin Tim. Now your conclusion is less safe – a 50-50 bet, in fact. On

learning further that there is a third identical sibling Tam it has now become more likely that your original belief that Tom stole a book is false than true. Objectively, Tom always had identical siblings and there was no good objective reason for the conclusion. Yet your belief-forming processes have functioned correctly and your behaviour is rational, and this seems to imply that your beliefs generated reasons on their own. So, an unsheddable belief that you do not believe to be unsheddable generates a reason to believe its consequences. Only knowledge that the original information was unsound, e.g., if after Tom leaves the library you hear a director saying ‘Cut!’, are there no subjective reasons at all for believing that Tom has stolen a book. Schroeder (2004, 358) calls this *complete undermining*. Maybe knowledge of lack of autonomy could be considered as *completely undermining* – when an unsheddable belief is believed to be unsheddable, it no longer generates any reasons. However, remember that unsheddable beliefs are not always false or irrational since even malfunctioning processes will get things right sometimes. Throughout I have been assuming that unsheddability is an epistemic vice, but the reality may well be far more nuanced than this; our ordinary perceptual apparatus gives us beliefs that are in many respects unsheddable, but this is a feature of their proper functioning, rather than their malfunctioning.

4. Conclusion

In this paper I considered several objections in the literature that the wide-scope strategy did not avoid the consequence it was designed to avoid, namely that to comply with what rationality requires sometimes means believing the consequences of beliefs that are irrational or otherwise defective, whether you are aware of this defectiveness or not. This is typically because the belief named in the antecedent of the conditional is one that one cannot avoid having, for one reason or another (although there is no reason in principle why it is not a consequent that one cannot bring oneself to have that is not the source of the problem). Following a suggestion of Broome (2007, 37) I suggested that the problem is not with the scope of the conditional but the type of the conditional, and proposed that instead of a material conditional we should put in a conditional that does not contrapose or detach, like a counterfactual conditional. Noting a similarity between the rational requirement of modus ponens and the Ramsey test, I suggested that we are rationally required to have those beliefs

that passed the Ramsey test. Then, I worked through some complications so that the conditional properly linked the beliefs themselves rather than their contents, coming up with:

For all *stable* and *normal* reasoners, $(B(p \rightarrow q) \wedge \neg B(q)) \rightarrow$ rationality requires $B(p) > B(q)$

An interesting question I intend to leave open is whether rationality (or anything else, for that matter) requires one to be a stable and normal reasoner; there is reason to think that what distinguishes the kind of rationality human cognizers enjoy in contrast to lower animals and that is necessary for autonomy is that we are able to reflect on our own practices and thought processes and that this is mentally represented by higher-order attitudes, but this is a far more general requirement than having these specific inferential dispositions to convert between first- and second-order beliefs.

Another question that I intend to leave open is cashing out the clause, essential to the Ramsey test, of minimal adjustment to maintain consistency. This goes beyond logical consistency and I envisage it as excluding certain paradoxical cases like Moore-sentences, violations of the Law of Conditional Non-Contradiction, and in particular using as a basis for belief revision a belief you believe to be not properly connected to reasons, for even if this belief is true and you take it or believe it to be such, any kind of closure, whether under deductive entailment or some more limited principle, will result in a network of beliefs that is fundamentally unsafe. It is an essential part of my analysis that the rational requirement should be formulated in such a way as to make believing the consequences of such a belief rationally impermissible, for even though by having this belief one would maintain consistency between the beliefs named in the conditional, because of the bad history of the antecedent belief it is still more consistent over all (because of the comparative closeness of the counterfactual world in which there is no bad history) not to believe its consequences. However, consistency cannot be construed so widely as to smuggle in all the requirements of rationality that it is being used to explain, or to reduce to the claim that the beliefs we are rationally required to have are those that are best all things considered, for although this is undoubtedly true there do seem to be local requirements that are no less strict for the fact that sometimes global requirements may require us to violate them. Perhaps the way to do this would be to exclude normative beliefs from the body of

knowledge, although evaluative beliefs will be necessary, for it is these that would comprise the subject's being conscious of the fact that she would be making her own epistemic situation worse in the scenarios in question.

One final thing to note is that the rational requirement of modus ponens involves belief in the material conditional $p \rightarrow q$. I have not been much concerned with the credentials of this belief or how it has emerged. However, the Ramsey test for the conditional $p > q$ seems to follow equally as for the material conditional, and suggests that the rational requirement can be further generalized to say:

For all *stable* and *normal* reasoners, $(\mathbf{B}(p > q) \wedge \neg \mathbf{B}(q)) \rightarrow$ rationality requires $(\mathbf{B}(p) > \mathbf{B}(q))$

This seems to successfully rule out subjects consciously putting themselves in a worse epistemic situation than that from which they started.

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