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Anchoring Diachronic Rationality¹

[This paper is a precursor of sorts to ‘Unifying the Requirements of Rationality’. It’s on theoretical reason rather than practical, however, and in some ways it’s more extensive. I may try to revive it somehow, so comments are most welcome. It’s in somewhat rough shape. Please do not cite without permission]

Introduction:

In the last decade, it has become commonplace among people who work on reasons (although not uncontroversially so) to distinguish between normativity and rationality. Work by John Broome, Niko Kolodny, Derek Parfit, and Nicholas Shackel has helped to establish the view that rationality is conceptually distinct from reasons. The distinction allows us to make sense of the questions recently addressed by Broome, Kolodny, Reisner, and Shackel: is rationality normative, and if so, in what way?

Kolodny’s ‘Why be Rational?’ answered the first of these questions by claiming that there is no reason to be rational. In order to argue for this conclusion, Kolodny argues for a process account of rationality. Kolodny’s view is that rational requirements

¹ I would like to thank John Broome and Wlodek Rabinowicz for their many helpful comments on this paper. I have also benefited from a number of comments received during a presentation of this paper at Carleton University and from comments provided by the students in my graduate seminar on rationality at McGill University.

govern mental processes. His view is set in direct contrast to Broome's, who holds that rational requirements are primarily, and perhaps exclusively, concerned with relations among mental states at a time.

It is difficult to do Kolodny's paper justice in a small space, and the details of his argument need not detain us here, so I shall focus on the central reason why Kolodny can only draw the conclusion that there are no reasons to be rational if he focuses on process rationality rather than synchronic rational requirements.

One way to think of rationality is as a process for allowing an agent to change her mental states. In Shackel's phrasing, agents must be able to avail themselves of rational guidance. When an agent has a set of mental states that (in some sense) require being changed, we expect that there is a rational way for her to modify her mental states. To put it another way, rationality provides rational requirements that, if followed, will effect the correct changes in an agent's mental states.

Unsurprisingly, rational requirements which can do this work must be diachronic requirements. In other words, they must say something about what mental states we are rationally required to be in *next*, given what mental states we possess *now*. For reasons that will become apparent shortly, diachronic rational requirements that allow an agent to avail herself of rational guidance must pick out particular mental states that an agent is rationally required to possess. In other words, a rational requirement cannot just say 'here are a bunch of rationally permissible combinations of states, get into one of them,' but rather it must specify which mental state or states to be in. If a rational requirement

did not focus on a particular mental state or a particular combination of mental states, then it would be incapable of guiding an agent on her own.

Kolodny argues that once one accepts that rational requirements focus on particular mental states or combinations of mental state, or are ‘narrow scope’ in Broome’s terminology, then it is easy to see why rationality and reasons must come apart. His argument is a kind of bootstrapping argument. Suppose there is a process requirement to believe the immediate logical consequences of one’s occurrent beliefs. So, if one believes that John Travolta is President and one believes that if John Travolta is President, then the moon is made of green cheese, one would be rationally required to believe that the moon is made of green cheese. But, there was no reason to believe either premise, so it is not clear why there would be reason to believe what the premises entail. To say that our beliefs give us a reason to believe there immediate logical consequences is to bootstrap a reason for belief into existence, when none existed previously.

Because Broome’s synchronic requirements do not focus rational requirements on particular mental states, there is no possibility of their requiring an agent to have a mental state that the agent has no reason to have. Broome’s account does not allow one to rule out the possibility that there is some reason to be rational, because wide scope rational requirements are not subject to the bootstrapping objection.²

So, a good deal is at stake in considering what sort of theory of rationality is the right one. I take it that the following two claims are both correct, and that they are in tension with one another.

² I have argued elsewhere [Author...] that separate problems exist for the normativity of wide scope rational requirements.

C1. There are good reasons for accepting Broome's account of rationality, and that some of his motivations for casting synchronic rational requirements as wide scope requirements are also strong considerations for formulating diachronic rational requirements as wide scope, rather than narrow scope, rational requirements.

and

C2. As Kolodny and Shackel suggest, rationality must be structured in such a way that an agent can avail herself of rational guidance.

In this paper, I outline the possibilities from constructing a theory of rationality that respects both C1. and C2. I argue that such a theory will have a complex structure. In addition to having a complex structure, it appears as though a theory that respects both C1. and C2. will also have a diverse and complex set of justificatory criteria for determining which rational requirements there are and their relative stringencies. I argue, however, that there are some grounds for hope that a sufficiently rich theory can be developed from a single justificatory concept.

1. Synchronic Rationality:

An influential account of synchronic rationality, the rationality of a collection of mental states at a time, has it that many of the requirements of theoretical rationality can be expressed by using a wide scope operator, call it the *rational requirement*³ (R) operator.⁴ This operator governs complex propositions, whose constituent simple propositions are mental states. Consider two examples:

E1. You are synchronically rationally required not to believe both *a* and not *a*.

F1 $R\sim B(a \ \& \ \sim a)$.

and

E2. You are synchronically rationally required to (believe *q*, if you believe *p* and if *p* then *q*).

F2. $R\{[Bp \ \& \ B(p \rightarrow q)] \rightarrow Bq\}$

E1 tells us that we are rationally required not to believe contradictions, and E2 tells us that we are rationally required that if we believe a conditional and its antecedent, then we believe the consequent.⁵

I shall say quite a lot more about the logic of these rational requirements later in the paper, but for now I wish to point out one important feature. It is that for rational

³ As Kolodny (2005) observes, rational requirements are local in nature. The broader question of judging whether an individual agent is rational *tout court* is a separate matter, and one not considered here.

⁴ For a small sample of both supportive and critical work, see: Broome [1999], [2001], and [2005]; Kolodny [2005]; Reisner [2004]; Schroeder [2004]; Wallace [2001].

⁵ I use this grammatical barbarism, as English infinitives cannot be formulated with conditionals.

requirements that govern *conditionals*, as in F2, one is generally not entitled to detach the consequent of the conditional governed by R, when the antecedent obtains. So, in the case of F2, when both Bp and $B(p \rightarrow q)$ are true, RBq is not a valid inference. We may say of this requirement that the rationality is *non-detaching*.

There is a way of expressing *detaching* rational requirements. For rational requirements that do detach, the rational requirement operator will govern only the consequent of the conditional:

$$F3. [Bp \ \& \ B(p \rightarrow q)] \rightarrow RBq$$

In a detaching rational requirement like F3, one may infer RBq from Bp and $B(p \rightarrow q)$.

Broome argues that many rational requirements are accurately captured by using a wide scope (governing the whole conditional rather than the consequent alone) rational requirement operator. To see why, consider the difference between F2 and F3. A concrete example will help.

Suppose that I believe that today is Tuesday, and I also believe if it is Tuesday, then I am in Belgium. Would it be rational for me to believe that I am in Belgium? It may be, but it may not be. Suppose there is a good deal of evidence, of which I am aware, that today is Wednesday. It would seem odd to say that I am rationally required to believe that I am in Belgium. It would be odd to say this, because I take there to be a good deal of evidence for its being Wednesday. Its being Wednesday implies that it is not Tuesday. And, lacking an affirmation of the antecedent (It is Tuesday), it is not clear why

I would be rationally required to detach the consequent (I am in Belgium). If we take the rational requirement to have a narrow scope in this case, then we would have to accept that one is rationally required to believe the logical consequences of two unsubstantiated beliefs.

On the other hand, a wide scope rational requirement will not allow me to detach a rational requirement to the conclusion that I am in Belgium from my two unsubstantiated beliefs that Today is Tuesday and If it is Tuesday then I am in Belgium. All the wide scope rational requirement does is require me either to have all three beliefs or not to have at least one of the two antecedent beliefs. I am in equal compliance with this requirement of synchronic rationality, if I have all three beliefs or do not have one of the antecedent beliefs.

This is a point that bears repeating— to be in compliance with a rational requirement like F2, there is no *logical bias* or *rational bias* towards satisfying it by coming to believe the consequent of the conditional or by altering one's beliefs about the antecedents. This lack of logical and rational bias, while not obviously problematic for synchronic rational requirements themselves, will prove troublesome when we try to formulate diachronic rational requirements in an analogous manner.

2. Diachronic Rationality:

Diachronic rationality concerns rationality over time. It is a term that may be used to describe rationality over very great periods of time, the sorts of periods of time involved in long-term planning agency. Or, it may be used to describe rationality over very short periods of time. In this paper, I shall only employ examples that occur over a short span of time. I do so for two reasons. The first is that it is much easier to deal with examples that occur over a shorter period of time. And, it is sometimes best to start with what is easier, when the problem itself is not at all easy. The second is that I am hopeful that some sort of understanding of the short term cases could serve as a basis for understanding diachronic rationality over longer spaces of time and in more complex, planning-oriented settings.

In this section, I shall argue that the prospects are poor for giving an account of diachronic rationality that is parallel in structure to the wide scope account given of synchronic rational requirements, in part because it is a *desiridatum* of an account of diachronic rational requirements that it give us narrow scope, rather than wide scope, requirements. I shall also argue that the most straightforward way of trying to generate narrow scope diachronic rational requirements fails.

Let us briefly look again at an example from section 1:

E2. You are synchronically rationally required to (believe q , if you believe p and if p then q).

F2. $R\{[Bp \ \& \ B(p \rightarrow q)] \rightarrow Bq\}$

Let p be the proposition that Today is Tuesday, and let q be the proposition that You are in Belgium. E2 tells you that you are synchronically rationally required that (you believe that you are in Belgium, if you believe today is Tuesday and you believe that if today is Tuesday, then you are in Belgium). This synchronic rational requirement is wide in scope and non-detaching.

Suppose for the moment that you fail to satisfy this synchronic rational requirement. In order to conform to it, some change among the relevant beliefs would have to occur. That change in belief will be a process. If there are rational requirements that govern the process of belief change, they will by definition be diachronic rational requirements. In fact, one might even think that guiding belief change, so as to be in conformity with synchronic rational requirements, is one of the central roles (possibly among others) that diachronic rational requirements will play. Satisfying the relevant diachronic rational requirement will in turn result in our conforming to the synchronic rational requirement in E2. What would the logical structure of this diachronic rational requirement be? In order to spell out this first attempt, I shall have to introduce time into the notation.

E4. You are diachronically rationally required that (believe q at time t_i , if you believe p at time t and also believe if p then q at time t , but you do not believe q at time t)

$$F4. R\{[B_t p \& B_t (p \rightarrow q) \& \sim B_t q] \rightarrow B_{t'} q\}$$

This version of a diachronic rational requirement is non-detaching. An agent could conform to this requirement (ignoring for the moment the impossibility of travelling backwards in time), either by ceasing to have the conjunction of beliefs in the antecedent (contained within the square brackets), or by coming to believe q at the requisite time.

Regarding time now, there is, of course, the obvious point that once time t has passed, the antecedent to the conditional is a *fait accompli*. Taking it for granted that we cannot change the past, then there is only one way to conform to E4, and that way is to believe q at time t' . I believe that a good case can be made for allowing us to derive F5 from F4, once time t has passed:

$$F5. [B_t p \& B_t (p \rightarrow q) \& \sim B_t q] \rightarrow RB_{t'} q$$

The diachronic rational requirement in F5 is detaching. This is significant for a reason that I shall give in the next paragraph. Before doing so, I shall offer a brief justification for deriving F5 from F4. The justification is this. After time t has passed, there is only one way to comply with F4, and that is to come to believe q . You cannot be as you are diachronically rationally required to be unless you come to believe q at t' . This seems at least a reasonable *prima facie* ground for taking it that you are diachronically rationally

required to believe q at time t_i . Parallel derivations may be found in standard deontic logic, but I do not intend to explore the matter any further here.

One reason why having a detaching requirement is significant is because a detaching requirement can serve the vital role of being a guide for rationality over time. If one starts with the beliefs contained in the antecedent of F5, one *next* is required to form a particular belief. F5 tells an agent what she is required to do *after* being in the state at time t of believing p and believing if p then q . We can, in a sense, say that F5 explains why we can rationally move forward, because it picks out a single correct state to be in after being in a particular, incorrect state.

Were F5 to be correct, either because it can be derived from F4 or on some independent grounds, we would have a workable model for at least a very simple instance of the interaction between synchronic and diachronic rationality. Unfortunately, F5 is not correct, or at least it cannot be correct given the way I have set things up so far. To see why, return to an example of a synchronic rational requirement:

E2. You are synchronically rationally required to (believe q , if you believe p and if p then q).

F2. $R\{[Bp \ \& \ B(p \rightarrow q)] \rightarrow Bq\}$

The logic of F2 is such that the rational requirement is satisfied whenever the conditional corresponding to the rightmost arrow is true. That conditional is true in all cases, except

when the antecedent is true and the consequent is false. So, the conditional is true whenever the antecedent is false. Because the antecedent is a conjunction, the conditional is true whenever either or both conjuncts are false. With this in mind, consider the example of an individual who is in the following mental state:

E6. Joe believes both p and if p then q , but it is not the case that Joe believes q .

F6. $Bp \& B(p \rightarrow q) \& \sim Bq$

Joe is failing to meet the synchronic rational requirement in F2. If we accept the hypothesis that one of the important roles of diachronic rationality is to provide requirements that can guide us from synchronically irrational states to synchronically rational ones, then F5 would appear to point the way for Joe. Joe would be diachronically rationally required to believe q . Once he did that, assuming his other beliefs have not changed, he will be as he is synchronically rationally required to be.

The problem is that it is not clear why there would be a diachronic rational requirement that would require Joe to believe q . For on the current account, Joe would satisfy the synchronic rational requirement equally well by ceasing to believe either p or if p then q , or both. What is not clear about F5 is why it would be uniquely rationally correct for Joe to believe q . The synchronic rational requirement in question is fundamentally a consistency requirement, and it is no less consistent to stop believing the antecedent than it is to start believing the consequent.

The most obvious step to take in light of these considerations is to modify F4.

The modified version would be like this:

E7. You are diachronically rationally required that [(you believe q at time t_i or not believe at t_i both p and if p then q) if you believe p at time t and also believe if p then q at time t , but you do not believe q at time t]

F7. $R\{[B_t p \& B_t(p \rightarrow q) \& \sim B_t q] \rightarrow [B_{t_i} q \vee \sim (B_{t_i} p \& B_{t_i}(p \rightarrow q))]\}$

From the non-detaching diachronic rational requirement in F7, we can derive a detaching diachronic rational requirement in the same way that we derived F5 from F4:

F8. $[B_t p \& B_t(p \rightarrow q) \& \sim B_t q] \rightarrow R[B_{t_i} q \vee \sim (B_{t_i} p \& B_{t_i}(p \rightarrow q))]$

F8, although still providing a detaching diachronic rational requirement, is not subject to the same worry as F5. The requirement that is detachable in F8 is a disjunction, and any state of the agent that satisfies the detachable diachronic rational requirement in F8 will satisfy the synchronic rational requirement in F2. This is because the contents operated on by R in the consequent of F8 are logically equivalent to those operated on by R in F2.

F8 is better than F5 with respect to the fact that it does not unjustifiably provide a diachronic rational requirement that uniquely requires an agent to believe q .

Unfortunately, what it does provide is nowhere near as helpful as what F5 would have given us, had it been right. The problem with F8 is that in not privileging one way of satisfying F2 over any other, F8 does not provide guidance towards what to do. F8 on its own in effect tells us to satisfy F2 without telling us anything more than F2 did already. To put it another way, F8 is just a fancy way of say that if one is not in conformity with F2 now, then one is rationally required to be in conformity with F2 just after now. As F2 is timeless, F8 does not tell us anything that we did not already know from F2 alone.

In addition to the concern that F8 may not be more informative than F2, there is another reason why the failure of F8 to provide a definite course for an agent's reason to follow is problematic. With *only* F8 available as a guide, a rational agent will find himself in a situation like that of Buridan's ass. If an agent operated strictly on the rational requirements that applied to her, she would have too many appealing ways to satisfy the requirement in F8 (have the antecedent be false of her or have the consequent be true of her, or both), and lacking any further rational resources, would have no guide as to which way to be in particular. Without positing some other theorem of diachronic rationality, the requirement in F8 leaves the agent with too many choices and no rational way to choose amongst them.

The substance of this worry is quite clear, if we consider what an agent whose rational processes conformed strictly to the requirements of diachronic rationality might be like. Such an agent would follow the requirements of diachronic rationality and would not engage in irrational or non-rational processes. Each time the agent found herself failing to satisfy the synchronic rational requirement in F2, she would follow the

diachronic rational requirement in F8. Because that requirement underspecifies which mental state(s) she is required to acquire or lose, and because she has no non-rational resources available to her, the diachronically rational agent would constantly be getting stuck. She would be unable to move forward with her mental processes because there would be no procedure for choosing which of the equally permissible mental processes to engage in. If F8 were also to specify that one or the other of the disjuncts were rationally impermissible, then there would be no problem. But, because F8 *only* tells the agent that she must satisfy the disjunction and provides no additional rational guidance, the rational agent will remain stuck between two equally appealing disjuncts.

3.1. Using Supplements to Fortify Diachronic Rational Requirements:

Perhaps it is possible to get rationally unstuck by supplementing diachronic rational requirements with some other kind of required operation on an agent's mental states. I shall consider four types of supplements to diachronic rational requirements as they have been presented thus far. The first type supplement to diachronic rationality is that of a diachronic rational heuristic. The second type is the addition of a *normative ascent* requirement. And finally, the third is the addition of a broader criterion of coherence.

3.1.1. Heuristics:

One apparently plausible way to supplement diachronic rational requirements is to use a set of heuristics to determine which sort of belief revision to make. These heuristics might take several forms. One heuristic would be: when presented with equally satisfactory alternatives to satisfying a requirement of diachronic rationality, number them and roll a die with that many sides, choosing the alternative that corresponds with the number on the die. Another heuristic might be: choose the first satisfactory alternative that pops into your head. And a final example is: when subject to a diachronic rational requirement of the same form as the one in F8, always believe the consequent rather than disbelieving any part of the antecedent.

It may well be that heuristics provide the correct remedy to being rationally stuck. Any thorough account of diachronic rationality ought to examine in detail what kind of role heuristics play (even if that role turns out to be none) in a theory of diachronic rationality. In this paper, I shall only give a very small amount of attention to the heuristic solution.

There are at least two difficulties, although perhaps not insurmountable ones, in employing heuristics to resolve the problem under discussion here. The first is that heuristics are quite different in nature to consistency requirements. Heuristics help us to cut down on inefficiency in our mental processes, to put our attention where it is most needed, and to sort out sensible ways to use our limited cognitive resources without wasting those very resources on the problem of how to use them. And, perhaps, heuristics get us out of the kind of mental jams that occur when diachronic rational

requirements do not specify which of a group of rationally permissible alternatives an agent is to choose. In other words, heuristics play what might be called a pragmatic role in diachronic rationality. Unlike the requirement expressed in F8, we cannot justify the inclusion of a heuristic on the grounds of consistency (in fact, some reasonable heuristics may tell us to be inconsistent at times). Grounds for inclusion of a heuristic would instead be something to the effect that the inclusion of this heuristic would make our rational processes work better for us in a practical way.⁶

Because of the pragmatic character of the justification for the introduction of heuristics, it is not entirely clear what sort of thing they are. If heuristics are not themselves rational requirements in a formal sense (and I shall presently argue that they cannot be), then one would have to be given an account of what they are.

This brings us to the second worry about the use of heuristics to unstuck a rationally stuck agent. Heuristics are not consistency requirements in the way that F8 is, but thus far no argument has been given as to why diachronic rational requirements must only be consistency requirements. In principle heuristics could be diachronic rational requirements, but ones that are justified on some grounds other than consistency.

However promising this option may seem at first blush, it cannot be right. Heuristics may very well require us to engage in processes that are not consistent with satisfying diachronic rational requirements that are derived from consistency considerations. Here is an example. Suppose you possess a fairly large number of beliefs that in combination with other beliefs of yours entail contradictions. Some of those

⁶ For a more detailed account of the possible roles of heuristics, see: Roberts [2004] and Marsh, Todd, & Gigerenzer [2004].

contradictions will in practice cause you more trouble than others. For example, you may without realising it hold beliefs concerning the distance from Alpha Centauri to the Sun that entail a contradiction. In one physics class you were told the distance was x , while in a later one you were told y . Somehow over the years you have held the belief that the distance is x , and you have also at the same time held the belief that the distance is y . However, because you lost all your interest in physics, you have not given any thought to astronomical distances and are unlikely to again. These two beliefs, combined with your belief that x does not equal y , entail a contradiction. Given your lack of interest in physics or astronomy, being in this belief state is unlikely to be of any practical consequence.

On the other hand, you believe that your daughter will be waiting for you at the bus stop. You also believe that your daughter will not be waiting for you at the bus stop. These two beliefs jointly entail a contradiction. That these two beliefs entail a contradiction is likely to be practically problematic, as you will soon be faced with the problem of acting on one or the other in scheduling your afternoon activities.

It is quite likely that a reasonable heuristic would tell you to sort out the inconsistency among the latter set of beliefs and not to bother sorting out the inconsistency among the former set. Sorting out the inconsistency among your beliefs concerning astronomical distances is a waste of cognitive resources that could be used for more cognitively valuable purposes.

If a heuristic told you just that, then the heuristic would disagree with a diachronic rational requirement that required one to sort out one's beliefs when those beliefs jointly

entail a contradiction. You would be in the unfortunate position of being logically unable to satisfy both of two diachronic rational requirements, the heuristic and the consistency requirement. The heuristic tells you not to cease being (locally) synchronically irrational, while the diachronic consistency requirement does tell you to cease being synchronically irrational.

So, if one takes heuristics to be a special kind of diachronic rational requirements, then one trades the problem of underspecification or lack of guidingness for the problem of mutual unsatisfiability.

3.1.2. Getting Unstuck Again: Normative Ascent as a Supplement

Normative ascent is the view that, roughly, we come to acquire or lose beliefs by first acquiring a second order normative belief about what we ought or ought not to believe. A normative ascent requirement is a rational requirement that requires us to normatively ascend, so to speak. It will be helpful first to look at the process of normative ascent, and then to look at the normative ascent requirement itself.

Here is an example of normative ascent. Suppose that two friends of mine played squash yesterday. One friend, Alan, tells me that he won the match. The other friend, James, says that in fact he won the match. I know that Alan is a much better squash player than James, and further I know that James has an injured leg. On top of that, Alan never lies and James does so frequently. Seeing that the evidence weighs heavily in favour of Alan's having won, I form the belief that I *ought to believe* that Alan won. In

normative ascent, forming that belief results in the formation of a new, first-order belief: the belief that Alan won.

Normative ascent is one way that we might come to form new beliefs. We somehow arrive at a belief about what we ought to believe, and that belief results in our forming a first order belief- the belief we believe that we ought to believe. Is it plausible that our rational processes might work this way? At first blush, it looks problematic; a brief thought experiment follows that shows why there is some reason to doubt normative ascent is likely to result in the formation of new beliefs.

Let's refer to this thought experiment as the 'anti-Jones' experiment. We are by now familiar with the phenomenon of trying to keep up with the Jones family next door. You own a Kia, and your neighbour recently purchased an Audi S4. You are very obsessed with keeping up with the neighbours, and the fact that Mr. Jones has purchased a very fancy sports sedan will eventually drive you to purchase an equally fancy one. However, keeping up with Mr. Jones, who makes a great deal more money than you, has caused you to become impecunious, and you know that it is a really bad idea to buy an expensive sports car when you have so much debt to pay down. Still, knowing that he has a faster, better looking, and more prestigious automobile is just too much for you to bear.

Reflecting on the situation, and knowing that your desire to keep up with your neighbours is incurable, you reflect that what would really do the trick is to believe that your Kia is as fast, attractive, and prestigious as his Audi. The more you think about this, the more you realise that you ought to believe that your Kia is everything that his Audi is

and maybe even more. If you were in this circumstance, would the belief that you ought to believe that your car is as nice as your neighbour's be sufficient to result directly in your believing that your car is as nice as your neighbour's? My intuition in this case is that it would not be sufficient. The worry is that while believing you ought to believe something might lead you to take steps to believe it, it does not appear to be sufficient to get you to believe it.

So far I have presented normative ascent as a putative description of how agents might actually acquire or lose beliefs. Here I have offered an example that is intended to cast doubt on the correctness of that description. We may now ask a further question: does the fact that normative ascent is not a normal mechanism for belief acquisition and change have any implications for rational requirements relating to belief acquisition and loss? In particular, does this fact count against a rational requirement that requires us to believe something when we believe that we ought to believe it?

We should be cautious about which conclusions we draw about rational requirements from this thought experiment. While it is commonly asserted that *ought* implies *can*, it is not clear whether we should adapt that dictum to rationality; it is my view, although I shall not argue for it here, that *rationally required* does not imply *can*. So, that we often cannot have our rational processes follow the pattern set down by normative ascent does not imply that there is not a rational requirement that requires us to believe something if we believe that we ought to believe it. I shall call such a requirement the *normative ascent requirement*.

Granting for sake of argument that we cannot generate objections to the normative ascent requirement through the use of some kind of *rationally required* implies *can* principle, there may yet be other reasons for circumspection regarding the possibility of adapting normative ascent for use as an account of rational requirements. One reason for suspicion may be that it would admit cases like the Anti-Jones thought experiment. In that thought experiment, the belief about what one ought to believe was based on *non-evidential* reasons for belief. In particular, it was based on reasons that derived from the benefits of having the belief in question. If one were a rational evidentialist, someone who holds the view that it is only rational to believe things based on evidential (or perhaps logical) grounds, then the normative ascent requirement might be objectionable. The rational evidentialist would find the normative ascent requirement objectionable, because it would admit of instances, like the Anti-Jones case, in which an agent might be rationally required to believe something based on non-evidential considerations.

The objection from rational evidentialism should not be taken as a decisive blow against the normative ascent requirement. The normative ascent requirement can be reformulated with an evidentialist qualifier. The evidentialist version of the normative ascent requirement would rationally require one to believe what one believes one evidentially ought to believe. This, or something like it, ought to meet the objection from rational evidentialism.

It seems that if we rule out the objection from rational evidentialism, we are left with only one potential ground for worry about normative ascent as an account of rational

requirements. Perhaps the trouble with the normative ascent requirement is that it is an operation on a second order belief.

By themselves, rational requirements that operate on second order beliefs cannot be ruled out. The synchronic rational requirement not to believe contradictions no doubt applies to contradictions that are comprised of belief propositions. It is rationally required of me that I do not both believe that I believe that there is a current king of France and believe that I do not believe that there is a current king of France. What separates normative ascent from the non-contradiction requirement is that it necessarily involves a second order belief in a way that the synchronic rational requirement forbidding me to believe contradictions does not.

I can see one reason, although I do not find it persuasive, why the necessary involvement of a second order belief in a rational requirement might be grounds for doubting that requirement. In general, it seems as though rationality can otherwise be described in first order terms. The non-contradiction synchronic rational requirement does not require one to cease to believe a contradiction just if one believes that one believes a contradiction. The non-contradiction requirement instead operates *transparently* on the beliefs that one has. One can fail to conform to the requirement even if one does not believe one believes a contradiction.

A deep argument would be required to explain why a requirement of either synchronic or diachronic rationality must not necessarily involve second order beliefs about one's own beliefs. I do not believe such an argument could be given, but I shall leave the matter open here.

With these worries put aside, we can formulate a rational requirement that an agent is rationally required to believe p , if he believes that he ought to believe p . Perhaps combining this rational requirement, or some version of it, with F8 would get an agent unstuck. Unfortunately, when one formalises a diachronic version of the normative ascent requirement, it leads one back to the very same problem that the normative ascent requirement was introduced to solve. Consider a first formulation of the requirement: if an agent at t believes that he ought to believe something but does not believe it, then he believes it at $t1$. We can formalise this version of the normative ascent requirement like this:

$$\text{NA1. } R[(B_t \text{ OB}p \ \& \ \sim B_t p) \rightarrow B_{t1} p]$$

NA1 presumably applies at least when the synchronic rational requirement NA2 is violated:

$$\text{NA2. } R(\text{BOB}p \rightarrow Bp)$$

We can see that NA1 is of little use to us for many of the same reasons that F4 earlier proved problematic. NA1 allows for the detachment of $RB_{t1} p$ because at $t1$ ($B_t \text{ OB}p \ \& \ \sim B_t p$) is already a *fait accompli*. And at $t1$, the agent may no longer believe $\text{BOB}p$, in which case he has satisfied NA2, already, making it a matter of rational indifference, rather than requirement, as to whether or not he believes p .

To account for this problem, we could formulate NA3:

$$\text{NA3. } R([B_t \text{OB}p \ \& \ \sim B_t p) \rightarrow (B_{t1}p \vee \sim B_{t1}\text{OB}p)]$$

The trouble with NA3 is that it brings us back to where we started. This version of normative ascent does not give us a unique or even preferred solution as to how to proceed when we fail to meet the synchronic rational requirement in NA2. An agent who only had rational resources available to her would again find herself in a diachronic rationality version of the dilemma that Buridan's ass faced. The normative ascent requirement cannot be invoked to decide between the disjuncts in the antecedent of F8, because doing so will only lead us to need to find some way of resolving between the equally permissible disjuncts in NA3.

There is a further worry about using the normative ascent requirement, although I believe that the one already given is sufficient to dissuade us from seeing it as a solution. Suppose we were to find some formulation of the normative ascent requirement that did not lead us into an infinite series of diachronic rational requirements which needed further requirements to avoid being stuck in the dilemma of a rational Buridan's ass. If we had such a formula, why not rely on it immediately? As diachronic rational consistency requirements are bound to result in detaching disjunctive rational requirements, it is not clear why one need bother with them at all.

The difficulty is that, even if there were some formulation that did work, it would have to give us a particular detaching rational requirement, for it is a detaching

requirement that would provide for us a particular mental state to be in, rather than a disjunction of equally permissible mental states. Suppose that under some circumstance, we could detach $RB_{it}p$ based on our initial belief that B_tOBp . Now suppose p is the belief that q and not q . We would again have two rational requirements that it would be logically impossible to mutually satisfy, a synchronic rational requirement not to believe contradictions, and a diachronic rational requirement to believe a contradiction. Of course, a further application of the normative ascent requirement would be capable of eliminating the contradiction, but it may be worrisome that at least some diachronic rational requirements would be logically incompatible with some synchronic rational requirements.

3.1.3 Coherence:

So far rational requirements have been looked at individually. For any individual diachronic rational consistency requirement, there remains the difficulty of choosing between equally rationally permissible disjuncts. We might fortify diachronic rational consistency requirements by looking at them globally. One disjunct would be favoured over another if it better cohered with all of an agent's rational requirements.

There is a vast body of literature on belief revision, far too vast to discuss meaningfully here. Instead of trying to address the literature as a whole, I want to discuss

two general approaches one could take to making coherence work. The first I shall call ‘score keeping.’ The second I shall call ‘weighting.’ In fact, score keeping makes an implicit appeal to weighting, but it will be more convenient to treat them separately here.

The score-keeping approach to coherence requires a measuring procedure for determining to what degree a particular belief coheres with the complete set (or complete relevant set) of an agent’s rational requirements. An agent would be rationally required to adopt the belief that coheres best.

Score-keeping by itself will not help an agent get unstuck for much the same reason that simple diachronic consistency requirements will not help get an agent unstuck. Consider an agent who has two rational requirements acting on her:

$$F8. [B_t p \& B_t (p \rightarrow q) \& \sim B_t q] \rightarrow R[B_{tt} q \vee \sim (B_{tt} p \& B_{tt} (p \rightarrow q))]$$

and

$$F9. [B_t x \& B_t (x \rightarrow q) \& \sim B_t q] \rightarrow R[B_{tt} q \vee \sim (B_{tt} x \& B_{tt} (x \rightarrow q))]$$

Suppose our agent presently has the belief states:

$$B1. B_t p \& B_t (p \rightarrow q) \& \sim B_t q$$

and

$$B2. B_t x \& B_t (x \rightarrow q)$$

There are a variety of ways that an agent could get into complete compliance with both F8 and F9. The agent could believe q . Or, the agent could believe q and cease to believe p , and so on. Score keeping by itself is subject to the same kinds of problems that arose with diachronic consistency requirements.

To make score keeping work, one needs to introduce the second type of coherence requirement: weighting. Weighting is a system that gives preferences to certain belief changes over others. One might adopt, for example, the principle of conservatism.⁷ Conservatism tells us that we must give special weight to beliefs that we already have. So, for the agent who holds B1 and B2, the favoured revision would be to come to believe q , rather than to give up any of the already held beliefs. This is because it takes some kind of additional consideration to overturn beliefs that we already hold.

Conservatism on its own will underdetermine what to do in a wide variety of cases. Consider an agent who is in the following groups of belief states:

B3. $B_t p \ \& \ B_t (p \rightarrow q) \ \& \ \sim B_t q$

B4. $B_t \sim q \ \& \ B_t (\sim q \rightarrow x) \ \& \ \sim B_t x$

B5. $B_t p \ \& \ B_t [p \rightarrow \sim(p \rightarrow q)] \ \& \ B_t (p \rightarrow q)$

There is no coherence optimising solution on conservatism for this collection of beliefs. Conservatism is not the only possible weighting principle, but it should be possible to construct belief groupings that are not given a determinate revision solution for a very

⁷ See Harman [1999] and [1986].

wide variety of plausible weighting principles. Even score keeping and weighting do not provide a sufficiently powerful supplement to rescue rational consistency requirements so as to give them the determinacy needed for keeping fully, and only, rational agents unstuck.

4. Giving up Rational Requirements:

The one option that I have not yet discussed in any detail is giving up altogether on diachronic rational consistency requirements, at least those that are captured in the general form of wide-scope diachronic rational requirement operators. This option may prove the most successful, yet it raises serious questions about the relationship between synchronic rationality and diachronic rationality and possibly about synchronic rationality itself.

It is possible that our troubles stem from the innocent looking assumption that one of the roles of diachronic rationality is to guide us from states that fail to satisfy a particular synchronic rational requirement to states that do satisfy it. Diachronic rational requirements, I have suggested, must, if implemented, take us somewhere in particular. Because there are generally multiple ways of satisfying synchronic rational requirements, diachronic rationality must have some way of specifying at what state our rational processes should arrive, other than just to any one of the states that fit the description of being a state that meets the relevant synchronic rational requirement.

One of those other ways is to adopt a heuristic or a system of heuristics that would get us unstuck. A system of heuristics might be as simple as a few rules such as ‘break all logical ties with a fair die’ or ‘pick the first of the two disjuncts governed by R’ to something as complicated as a full-blown planning theory of rational agency. A concern that I raised for such a system of heuristics is that if we treated the system or the individual heuristics as part of a system of rational requirements, then they could quite easily come into conflict with some synchronic rational consistency requirements. This looked like a problem because it seems desirable to be able to conform to one of both the requirements of synchronic rationality and the requirements of diachronic rationality respectively without failing necessarily to conform to the requirements of the other.

Yet, if diachronic rational requirements must lead us somewhere and not get us rationally stuck, then perhaps the requirements themselves are, in some sense, fundamentally practical, even in the case of theoretical rationality. What I mean by practical is not that the requirements are geared towards action, but rather that the basis for the requirements of diachronic rationality are not those of logical consistency among the contents of one’s beliefs. Rather, the requirements of diachronic rationality may well derive from considerations of what is required to be a theoretically functioning, effective, thinking agent. If it is these practical, for lack of a better term, considerations that drive a theory diachronic rationality, then there are two possibilities that we must take into account.

The first is that a theory of diachronic rationality may look very different to the sort of theories of diachronic rational requirements that were examined earlier in the

paper. Instead, one will need a theory of diachronic belief revision that derived its requirements from the practical considerations that arose in producing a functional thinking agent. So-called theories of minimal or limited agency already look in this direction. Perhaps diachronic rational requirements could be properly produced by a project akin to work that has been done on diachronic rational requirements in action for theories of planning agency.⁸

If it does turn out that diachronic rational requirements must be spelled out by a complex system of practically guided considerations, then diachronic rational requirements will be very different from the sort of synchronic rational requirements discussed in this paper. There are various possible ramifications for this. The most disappointing is that there is unlikely to be a neatly fitting, unified account of diachronic and synchronic rational requirements, if they are, *ex hypothesi*, so very different in form and in source.

One alternative possibility is that we may be mistaken about the nature of synchronic rational requirements. It may be a mistake to think that synchronic rationality functions in the way that has been discussed in this paper, as a system of consistency requirements. If the basic aims of synchronic rationality are given by a kind of constricted pragmatism, then perhaps there is hope for a greater reconciliation of synchronic and diachronic rationality.

On this view, we need not reject the possibility that there are synchronic consistency requirements, but we would have to view them as getting their rational force

⁸ See for example Bratman [1999].

not directly from the fact that they place logical consistency constraints on our mental states, but rather because the aims of cognition are in general advanced by being such that we meet consistency requirements. This would change the force of synchronic rational consistency requirements, as they would have to be treated as defeasible rather than absolute. But, if we are to reconcile something that resembles our current view of synchronic rationality with a version of diachronic rationality that is adequately guiding, the weakening of the force of synchronic consistency requirements may be a necessary price to pay.

Conclusion:

I have not shown conclusively that diachronic rational requirements cannot be formulated in a manner similar to synchronic rational consistency requirements. However, if we do expect diachronic rational requirements to be sufficient for determining which particular belief states we are required to be in rather than telling us which disjunctions of states we are required to satisfy, it appears that we do have to give up efforts to express them using a form analogous to that of synchronic rational consistency requirements. If we do abandon this way of expressing diachronic rational requirements, then there is much additional work to be done to explain what relationship, if any, there is between synchronic and diachronic rationality.

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