1. Introduction

I have a neighbor, Jones. Suppose a year ago I believed that Jones owns a Ford. But, after talking with Jones, I have since found out that the Ford I routinely see him driving is on loan from his brother-in-law. In fact, I learned that Jones owns a Toyota, but that it does not run. So he drives the Ford. So I no longer believe that Jones owns a Ford, since I have become better informed about Jones and the Ford. For a contrasting scenario, suppose instead that I never talked with Jones about his car, but I nevertheless stop believing that he owns a Ford and insist now that he owns a Toyota. I have never seen him in a Toyota, and all evidence points to his owning a Ford. But I steadfastly now deny that he owns a Ford even though I am not better informed about the matter.

There is an obvious difference between these two scenarios. The first possibility—the case where I become better informed about Jones—seems completely uncontroversial. If the second possibility characterizes some of the differences between my epistemic states of then and now, however, we have the feeling that something has gone wrong. There is a clear sense in which I ought to have jettisoned my belief that Jones owns a Ford in the first case, but not in the second. It is a fact that beliefs change; it is a philosophically interesting fact that beliefs change—and ought to change—in particular ways.

Some changes in belief are rational or justified and others are irrational or unjustified; some transitions between two epistemic states are epistemically justified changes or transitions, some not. And while this sense of justification is, at least at first blush, not the concept which is the explicit focus of many epistemological theories, it is nevertheless a sense of justification which is as epistemic as any concept is. So we have (at least) two concepts of epistemic justification. And where there are concepts as rich as these, there are debates. One debate about justification, call it the debate over the statics of justifiedness, is the familiar debate about what it takes for a belief of an agent to be justified at a time. The other debate, call it the debate over the dynamics of justifiedness, is the debate over what it takes to be a justified
transition between epistemic two states.\(^1\) Just as one might have foundationalist or coherentist scruples about the statics of justification, so too might one invoke counterparts of this distinction in the dynamics debate—and many have, notably Harman (1984), Hansson (1989), Fuhrmann (1991), and Gärdenfors (1992).

I am not the first to take aim at dogmas which surround the systematic study of the concept of justifiedness in the dynamic sense. Hans Rott (1999) has argued that it is a mistake to think—as most involved in the formal modeling of belief dynamics claim to—that rational belief revision must be doxastically conservative and, when the choice arises, should sacrifice less entrenched beliefs instead of more entrenched beliefs. These are dogmas, he argues, because although many profess to endorse these principles as desiderata for any reasonable account of belief change, their theories do not (and ought not) have these professed properties. The dogmas at issue for me surround the rather different issue of what relationship obtains between our two debates, the static and the dynamic, over justifiedness.

We would rather, *ceteris paribus*, have one debate instead of two. There is a natural view—the orthodox view—according to which debates over the statics of justifiedness decide debates over the dynamics of justifiedness. This is the first of the two dogmas. This view embodies a sort of reductionist thesis about the concept of justified belief change. One purported advantage of this view—this is the second dogma—is that it would explain why the foundations–coherence distinction apparently has the contours that it has in the debate over the dynamics of justifiedness, and insofar as we have a firm grasp on the essential features of the distinction in the static case it would inform us on a similar score in the dynamics debate. Natural or not, I will argue that this view cannot be right. Questions of justified belief change are, in an important sense, autonomous.

In broad outline, the argument will go as follows. First, I want to establish that the orthodox view is both plausible and has an impressive list of supporters. Then I want to illustrate a main advantage of the view by looking to the foundations–coherence distinction in belief dynamics. I want to argue that this supposed advantage is no advantage at all since the foundations–coherence distinction in belief dynamics does no philosophical work there. With no major advantage to be had from the orthodox view, we should not be disappointed when we find out—as we will—that the view cannot be right.

2. Orthodoxy

The orthodox view is just this: an adequate theory of the concept of justification construed as a property of beliefs determines a theory of justification construed

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\(^1\)An excellent introduction to belief dynamics is Hansson (1999); the classic book-length treatment is Gärdenfors (1988).
as a property of transitions between epistemic states. And although this is the orthodoxy, it is not the sort of thing for which we very often see explicit arguments. I suppose that is what makes it a dogma of belief revision, rather than a well-supported thesis of belief revision. Nevertheless, it is the sort of view which, with just a little reconstruction, can easily be seen in a number of (otherwise quite diverse) epistemological views.

Consider, for a first example, standard process- or normal worlds-reliabilism (Goldman, 1986). The main structural feature of Goldonian reliabilism is that beliefs are justified (in the static sense) just when they are the product of a right system $R$ of justificational rules ($J$-rules). Moreover, a system $R$ of $J$-rules is right iff there are (actual) psychological processes permitted by $R$ and either the ratio of true beliefs to false beliefs so produced would be sufficiently high (if a process instantiating $R$ would produce full beliefs or acceptances) or the system $R$ is “well-calibrated” (if a process instantiating $R$ would produce partial beliefs).\(^2\)

Turning to the concept of justification construed as a property of transitions between epistemic states, it is easy to see how a reliabilist story would and should go. A change from epistemic state $K$ to $K'$, under the influence of the new information $q$, is a justified change iff the change is sanctioned by a right system of $J$-rules. But systems of $J$-rules are right iff the beliefs so produced have a sufficiently high truth-ratio. Whence it follows that the transition from $K$ to $K'$ is justified iff the beliefs supported in state $K'$ are, by the reliabilist’s lights, justified—i.e., iff the beliefs supported in state $K'$ have a sufficiently high truth-ratio. And so whether or not a change in view is justified in our dynamic sense is fully determined by whether or not the posterior beliefs are justified in our static sense. And this is precisely what we would expect were the orthodox view true.\(^3\)

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\(^2\)Being well-calibrated is the partial analogue to having a sufficiently high truth-ratio: $R$ is well-calibrated, on Goldman’s account, just in case for every degree of belief $d$ the truth-ratio of beliefs of degree $d$ is approximately $d$.

\(^3\)This gloss is borne out by Goldman’s discussion, for instance, of the “Anchors and Adjustments” (A-and-A) model. The details of the model are not, for our purposes here, what is important. Rather, what I want to stress is that Goldman’s discussion proceeds by probing whether or not such a model is well calibrated and hence could be a right system of rules. Thus he writes that “the main point to be made here is that there isn’t any reason why an A-and-A process described by Einhorn and Hogarth could not perform adequately, as judged by the good-calibration criterion. Hence, there isn’t any reason why it could not be approved by a right $J$-rule system” (Goldman, 1986, p. 354). Hence, he wants to conclude, an A-and-A model might be sanctioned as a normatively acceptable theory of belief updating—and the grounds for this is simply that an A-and-A model might be well-calibrated, i.e. it might produce (partial) beliefs which are justified.
Similar considerations apply to coherence theories of justification. Take, for example, the negative holistic coherence theory (Harman, 1986). The basic analysis is that $S$’s belief that $p$ is automatically justified (if she does indeed believe it) unless she has some special reason for thinking that belief in $p$ is no good. A belief is no good, in turn, just in case it fails to cohere with the rest of her beliefs, and this might in turn be a function of the explanatory relationships which do or do not obtain between the belief that $p$ and the rest of her beliefs.

Suppose $S$ wants to take on a new belief, say, that $q$. How ought she change her overall view? The details are tricky, no doubt, depending on the details of the concept of explanatory coherence. But the general picture is clear enough. A belief is justified (for $S$) in our static sense iff $S$ believes it and has no special reason for thinking such a belief is no good. But then it is immediate that one ought to stop believing that $p$ just when one has a positive reason for thinking the belief that $p$ is no longer any good. For any $p$, when one stops believing that $p$ for such reasons, then let us say that the resulting state of belief is a conservative $p$-less alternative to the original state. The negative holistic coherence theory then makes the following claim when it comes to evaluating a change in view: the change from prior state $K$ to posterior state $K'$ (under the impact of the newly accepted belief that $q$) is a justified change iff: (1) $K'$ carries commitment to $q$; and (2) for all $p$’s such that $K$ carried commitment to $p$ and for which the agent has a special reason for thinking belief in $p$ is no longer any good, $K'$ is a conservative $p$-less alternative to $K$. Two remarks are in order about this sketch of a theory of justification in our dynamic sense. First, the bottom-line proposal of the sketch is just the same as that which Harman himself gives (Harman, 1984). Second, the constraints of the negative coherence picture of epistemic justification in our static sense determined the sketch in a straightforward way. Just like in the case of Goldmanian reliabilism, this is precisely what we would expect were the orthodox view true.

Perhaps the clearest example of a theory which embraces the orthodox view is a certain strain of (non-doxastic) foundationalism (Pollock, 1995, 1997; Pollock and Cruz, 1999). Contemporary foundationalists tend to think of the justification of a belief as a matter of procedure. Giving a theory of justification in our static sense just is the specifying of a procedure whereby an agent can come to have a justified belief, given her information. And this, in turn, is just the articulation of the epistemic norms for the having of justified beliefs, together with a theory of how those norms interact. In Pollock’s case the only pathway for new information is the

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4The theory is negative in that reasoning plays essentially and only a negative or undermining role, informing us when an agent ought not persist in believing something; the theory is holistic in that there are no linear, asymmetric “reason-for” relationships of epistemic dependency which obtain between beliefs. Here I follow the taxonomy in Pollock and Cruz (1999).
introduction of new information into an agent's epistemic state via sense perception, the deliverances of which let us call percepts. Justification, construed as a property of beliefs, is then determined by the percepts the agent has plus her epistemic norms. A crucial fact about epistemic norms is that reasoning according to them is a defeasible affair. In fact, it is defeasible twice over. It is synchronically defeasible in that, as an agent reasons further while holding fixed her perceptual information, she may uncover defeaters for some of her beliefs; it is diachronically defeasible in that, even supposing an agent is ideally rational and has completed all stages of reasoning with respect to her perceptual information, the acquisition of new percepts may lead to beliefs which rebut or undercut, and hence defeat, previously held beliefs. An agent’s belief that \( p \) at a time is justified iff it is supported by an undefeated argument instantiated in her epistemic state.

Suppose an agent is in epistemic state \( K \) and we want to ask what a justified belief change would be, given the new information that \( q \). Assuming that \( q \) is a new belief to be added, then for the sort of foundationalist we have been considering this question is not yet well-formulated. The reason is simple: new information from the world must be encoded not as a belief but as a deliverance of sense perception. So suppose \( q \) is the proposition that it is sunny. To get this new information into the agent’s epistemic state, the typical route will be that the agent looks outside, and finds herself in the pre-doxastic state of having a perceptual image with the content that it is sunny—a \( q \)-percept. Let us write \( \lbrack q \rbrack \) to represent such a state. Pollock’s view is then that \( \lbrack q \rbrack \) is a defeasible reason to believe \( q \). If we want to know whether a change in epistemic state \( K \) to state \( K' \), under the impact of \( \lbrack q \rbrack \), is justified (in our dynamic sense) all we have to do is add \( \lbrack q \rbrack \) to the set of percepts in \( K \) and then apply the machinery of the theory of justification (in our static sense) to the result. The transition to \( K' \) is justified iff it is so derived from \( K \). And, just like in the cases of negative coherence theories and Goldmanian reliabilism, this is precisely what we would expect were the orthodox view true.

Now, for all I have said so far, the real orthodoxy does not embody this reductionist thesis from dynamic justification to static justification, from justification construed as a property of transitions between epistemic states to justification construed as a property of beliefs. Indeed, is it not possible that all I have done so far is marshall some evidence that some epistemological theories happen to have this added bonus that, according to them, they can give unified accounts of both phenomena?

I do not think this weaker reading of the scenario will do, for at least three reasons. One: it makes the orthodox view unduly weak and uninteresting. Two: 

5This is one of the criticisms leveled against the AGM theory of belief revision in Pollock and Gillies (2000).
such a reading is squarely at odds with what I take to be the unmistakable tone of the relevant passages of Goldman, Harman, and Pollock. In fact, Pollock quite explicitly thinks that theories of belief revision should be, as he says, derived from detailed and concrete epistemological theories of justification in our static sense.\(^6\)

Third: it leaves unexplained the frequency and persistence of the “What–Come on–surely” argument which meets one explaining the philosophical significance of the debate over the dynamics of justifiedness—upon explaining the problem one immediately hears “What? Come on, surely it is the case that the right story about static justification will just determine the right story about belief revision!”

What makes the orthodox view plausible is not so much its impressive list of apparent supporters as it is the ease with which, once coupled with a theory of justification in the static sense, it delivers a clear and principled theory of justification in the dynamic sense. Moreover, were the view right, we would expect to get some mileage from it in the foundations–coherence debate over the dynamics of justifiedness. If that mileage could in fact be had, then this would serve as both confirmation of the view and a major benefit of it.

3. Foundations and Coherence

A theory is a foundations theory of justification in our static sense iff, according to the theory, there are basic justification-conferring states and an agent’s belief that \(p\) is justified just in case it is legitimately based on or inferred from such a basic state or it is legitimately based on or inferred from other justified beliefs—where, and this is important, the relation of having being legitimately inferred from is not symmetric and must be acyclic. The insistence on the asymmetry of reasons entails that, for foundations theories, it must be that every justified belief has a chain of reasons which ultimately reaches back to the class of privileged, basic justification-conferring states.\(^7\) For the foundationalist, static justification of a belief is a matter of pedigree.

Coherence theories of justification deny that any states have such a privileged, basic justification-conferring status. Holistic coherence theories, moreover, deny that asymmetric “reason-for” relations obtain between beliefs—or, put differently, they deny that such relations matter to the positive epistemic status accorded to beliefs. Justification in our static sense is a matter of how well or how poorly a belief

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\(^6\)See Pollock and Gillies (2000), especially passages on p.70 and p.90. There is some ambiguity in the main argument in that paper, suggesting a strong and weak reading of the main thesis. The strong reading is fairly attributable to Pollock, the weak to his coauthor.

\(^7\)If those states are all belief states, then such a theory is a doxastic foundations theory; if they are all internal, then it is an internalist foundations theory; if some are external states, then it is an externalist foundations theory.
fits in with an agent's overall doxastic state. For the coherentist, static justification is a matter of the company a belief keeps.

There is broad agreement that something like this distinction between foundations theories and coherence theories applies, and applies equally well, to the debate over the dynamics of justifiedness. This is our second dogma.

The distinction between foundations and coherence theories of belief change is best seen after we have a clear view of the sorts of theories which are meant to fall on either side of the divide. The classic example of a coherence theory of belief revision is the so-called AGM model of belief revision, so-named after Carlos Alchourrón, Peter Gärdenfors, and David Makinson (Alchourrón, et al., 1985; Gärdenfors, 1988). The basic idea, for our purposes, is this. Belief states can be represented by a logically closed set of sentences. This represents what an agent in a given epistemic situation is rationally committed to believing (even if she does not, for reasons of computational complexity or memory limitations, explicitly hold the beliefs). Belief change is then a process taking one from such an equilibrated state to another equilibrated state under the impact of some new belief. The main criterion in the AGM model for when a belief change is justified is a matter of information economy: when changing one’s view, one should avoid giving up beliefs unnecessarily. In particular, since asymmetric relations of epistemic dependency are not thought to obtain (or, at any rate, are not thought to matter), it is overall doxastic conservatism which has primary normative force for determining when and how a change in view is a rational one.

Now, there are simple examples which suggest that coherence theories of this type are inadequate. Consider the following, which is a variant of an example due to Sven Ove Hansson (1989). There is a certain town which has just two coffee shops, A and B. You are walking down the main street in this town on a public holiday. Let us consider two cases. In the first case, you see Jones on the street enjoying a coffee. You form the belief that one of the two coffee shops is open; that is, you believe Either A is open or B is open. Now, in fact, you see what you take to be a sure-sign that it is A that is open. Your relevant epistemic commitments can be represented as the closure of the set of beliefs \{A, A \lor B\}. As you approach coffee shop A, you see a sign in the window: CLOSED ALL DAY FOR CLEANING, and have to revise your beliefs accordingly. Intuitively speaking, in your posterior epistemic state you ought to still be committed to the disjunctive belief that Either A is open or B is open.

Contrast this with a second case in which you do not see Jones or anyone else on the street enjoying a coffee. Suppose that you do see what you take to be a

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8This broad agreement is not quite consensus; see Hansson and Olsson (1999) for a dissenting view.
sure-sign that it is \( A \) that is open. You, accordingly, believe that \( A \) is open. Your relevant epistemic commitments can be represented by the closure of the set \( \{ A \} \). Of course, since \( A \) entails the disjunction \( A \lor B \), the set of commitments in this case is just the set of commitments from the earlier case. Just as before, as you approach coffeeshop \( A \), you see a sign in the window: CLOSED ALL DAY FOR CLEANING, and have to revise your beliefs accordingly. In this case, however, it seems that in your posterior epistemic state you ought not be committed to the disjunctive belief that Either \( A \) is open or \( B \) is open. Intuitively, you believed the disjunction Either \( A \) is open or \( B \) is open in this case just because you believed one of the disjuncts—it was, in this sense, a derived or non-basic belief. Not so in the first case: it is not so that you believed the disjunction just because you believed one of its disjuncts—in that case you believed the disjunction on independent grounds.

Lest we think that the trouble surrounds disjunctive beliefs, let us look at another example. Suppose you know that Jones has the following hat-wearing habits: on rainy days, he invariably wears his hat; on non-rainy days, he either wears his hat or leaves it at home completely at random.\(^9\) Suppose you see what you take to be a sure-sign that it is a rainy day. You are thereby committed to believing that Jones is wearing his hat. However, should you find out that you were mistaken about the weather you should give up the belief about Jones and his hat. You believed it just because you believed it was rainy. The AGM theory of belief revision cannot rule out that you retain the belief (since it is overall informational match between prior and posterior state which justified belief changes must seek to maximize).

The basic idea for foundationalist belief change is that there is a difference between beliefs which are basic or independent or non-derived and beliefs which are non-basic or dependent or derived. Moreover, foundations theories of belief change insist that this difference makes a difference to the landscape of rational or justified changes in view. Coherence theories, on the other, deny that such a distinction plays a fundamental role in the process of revising one’s epistemic commitments. If the orthodox view were indeed right and debates over the statics of justifiedness determined debates over the dynamics of justifiedness, then it is easy to see that we would indeed expect to see this divide between foundations and coherence theories of justification in our dynamic sense. Hans Rott advertises this payoff of the orthodox view rather clearly:

> The analysis of belief revision is not dependent on features that distinguish genuine knowledge from mere belief. It is rather dependent on the structure of the formation of beliefs as they are relevant in the theory of knowledge. What I have in mind above all...

\(^9\)This example is due to Pavel Tichy (1976), although his target was not belief revision but the Stalnaker–Lewis analysis of counterfactuals.
is the fundamental distinction between foundations and coherence theories of knowledge. (Rott, 2002, p. 48)

Such a tight connection would be a major advantage of the orthodox view.

I think this supposed advantage is, at best, oversold. To see why, let us look at two types of foundations theories of belief change. The first is the class of belief-base models (Hansson, 1989; Fuhrmann, 1991; Rott, 2002). The idea is to tweak the AGM model to allow for a distinction between derived and non-derived beliefs. As follows: an epistemic state is now represented not as a set of beliefs closed under classical consequence, but rather as a finite belief base. Beliefs in the base are basic or non-derived or independent beliefs. We close these finite bases under consequence to obtain a belief set, but belief revision confronts the base not the belief set at large. Mathematically, revision operators in belief-base models are very much like AGM revision operators, but restricted to perform on bases instead of large deductively closed sets—justified changes are changes to bases which minimize information loss. Nevertheless, such models have a clear way of drawing the distinction between derived and non-derived beliefs. Relative to a base $B$, a belief that $p$ is derived iff $p$ is entailed by the base $B$ but not in it—i.e., iff $p \in \text{Cn}(B) \setminus B$—and non-derived if it is in $B$.

The other class of foundations theories of justification in our dynamic sense are theories of defeasible reasoning, “reason maintenance”, and the like (Doyle, 1979; Pollock, 1995). The core idea is that the agent keeps track of what beliefs serve as grounds for what other beliefs, with a special subset of the beliefs (or subdoxastic states) serving as the foundations. Revision then amounts to adding new items to the foundational level, and then letting the rich and complex dynamics between defeaters, defeater defeaters, defeater defeater defeaters, etc. decide what items have adequate support in the posterior state. All beliefs except those at the bottom level are derived according to this picture. It is important to note that, from this point of view, there need not be—indeed it might not be possible to have—an interesting mathematical characterization of revision operators and their behavior. Adopting such a stance, one can show that virtually all of the AGM postulates for revision functions—even the “trivial” ones—are demonstrably violated; the epistemological details just seem to complicated (Pollock and Gillies, 2000).

Our second dogma is the purported advantage of the first. But now we are in a position to see why this advantage is really no advantage at all: the distinction between foundations and coherence theories of justification in our dynamic sense is inadequate for at least three reasons. First, it misses important similarities we want noted. There is a clear sense in which belief-base models are rather closely related to the AGM model, representing an unfriendly amendment to it rather than a seriously
different view of the dynamics of belief. Second, it misses important differences we want noted. There is a clear sense in which systems of defeasible reasoning are only very distantly related to belief-models, though both are on the same side of the foundations–coherence divide. Third, the distinction as it is typically drawn (placing belief-base models on the foundations side) makes it look like the intuitions being pumped by the coffeeshop cases and the Tichy case about Jones and his hat surround the deductive consequences of things we believe. But surely this is a mistake. There are a host of examples which seem to resemble the Tichy case in important respects but in which the connections between beliefs are allowed to be more subtle than brute consequence (Gillies, 2002). What unifies all of the cases, I think, is that considerations of epistemic dependency intuitively trump considerations of doxastic conservatism. And this is a rather more general point.

It is better, I think, to replace talk of the foundations–coherence distinction with respect to dynamic justification with talk of a loose ordering of theories from more to less foundational, with the AGM theory representing a limiting case. The suggestion is that theories of justified belief change differ in the extent to which they acknowledge in an epistemologically sophisticated way that some beliefs are held just because of some others and reflect this fact in specifying how beliefs ought to be revised—e.g., by acknowledging more varied and rich sorts of epistemic dependency relationships which might obtain, and hence trump considerations of doxastic conservatism. For short, let us say that theories differ with respect to how seriously they take the foundationalist intuition. So, in general, one theory is more foundational than another the extent to which the first takes the foundationalist intuition more seriously than the second. This way of carving the landscape places the AGM theory at the limiting end of the spectrum, and belief-base models close to them since the only dependency considerations allowed are relations of classical deductive consequence. Defeasible argumentation systems are rather far along toward the opposite end of the spectrum. Somewhere near the intuitive midpoint are theories which have non-trivial coherence properties but a comparatively rich structure of defeasible reasons (Gillies, 2002). For present purposes, it is enough to see that the second of our two dogmas is no great advantage, and has rather obvious competitors which do a better job at carving the conceptual space of theories of justification in our dynamic sense.

4. THE CASES AGAINST ORTHODOXY

The orthodox view is just the view that an adequate theory of the concept of justification construed as a property of beliefs determines an adequate theory of the concept of justification construed as a property of transitions between epistemic states. We can think of considerations marshalled against the orthodox view along
two dimensions. The considerations might be piecemeal, tied to a particular theory of justification construed as a property of beliefs; or they might be wholesale, not similarly tied to any particular story about justification in our static sense. The considerations might be concrete, culminating in counterexamples; or they might be abstract, drawing instead on indirect and high-level properties of theories of justification (in whatever sense).

Generally speaking, we would prefer considerations of the concrete and wholesale variety since they are both the most general and the most direct. Such considerations would be a clear case in which a subject is, pre-theoretically, justified in her beliefs prior and posterior to a change in view which is, again from the pre-theoretic standpoint, an unjustified change in view. I have no such considerations to offer, since I am inclined to think that something like the converse of the orthodox view is right—i.e., that the dynamics of epistemic states informs us about the epistemic status of the statics of epistemic states. Nevertheless, considerations of the concrete–piecemeal and abstract–wholesale will give us ample reason to think that the orthodox view cannot be right. I want to give three concrete–piecemeal examples which aim at showing that the orthodox view cannot be right. Each of these has a common form: Assume theory $X$ about justification in our static sense. Then consider two epistemic states $K$ and $K'$ such that the beliefs supported in each are, according to $X$, justified. Finally, link $K$ and $K'$ by a revision which, intuitively, is not a justified change in view. Thus, if $X$ is the right account of justification construed as a property of beliefs, then the orthodox view cannot be right.

The three cases I want to consider vary in the value of $X$—reliabilism, coherentism, and (fallible) foundationalism. The point in each case is the same: justifiedness of beliefs underdetermines justifiedness of changes in belief.

4.1. Case One: Process-Reliabilism. Suppose that simple process-reliabilism is the right account of when a belief is justified at a given time. Lucky Larry lives in a demon world, but the demon in question is an epistemologically benevolent demon. One of Lucky Larry’s preferred belief-forming mechanisms when it comes to adopting a new belief which will be the impetus for a change in view is wishful thinking. But Lucky Larry is lucky—the demon in his world engineers the facts about medium sized physical objects so that Larry’s beliefs produced by wishful thinking are reliable—the frequency of true beliefs to false beliefs so produced by Larry is sufficiently high. Of course, Larry has no belief to this effect, nor does he need such a belief to be justified in the things he believes on the basis of wishful thinking (at least by the reliabilist’s lights).

When Lucky Larry adopts a new belief, his epistemic state will have to be revised. Let us suppose that Larry knows a lot of logic, so that his set of beliefs at a time is
closed under classical consequence. In the case of interest, Lucky Larry will have to perform a non-vacuous change in view: he will have to revise with respect to some newly acquired belief \( p \) when his prior state carried commitment to \( \neg p \). In order to do this, he needs to first withdraw or contract his commitment to \( \neg p \) and then add the new belief that \( p \). But, for agents like Larry who are logically proficient, there will in general be many ways to achieve the first step of the revision process. For, if Lucky Larry believes that \( \neg p \), that \( q \), and that \( q \rightarrow \neg p \), he can withdraw his commitment to \( \neg p \) by deleting \( \neg p \) and \( q \) or by deleting \( \neg p \) and \( q \rightarrow \neg p \). Of course he may also delete all of \( \neg p, q, q \rightarrow \neg p \). In general, where \( K \) is logically closed, let \( K \perp \phi \) be the set of maximal subsets of \( K \) which do not imply \( \phi \). Each such set is a potential belief set for Larry when he contracts with respect to the belief that \( \phi \). Let us suppose that Lucky Larry is both lucky and rather skeptical: when he withdraws his commitment to \( \phi \), he believes just what is common to all of these potential belief sets. That is, Larry believes that \( \psi \) after withdrawing his commitment to \( \phi \) if and only if \( \psi \) is in \( \bigcap (K \perp \phi) \). The second step in the revision process is much simpler: Larry simply adds the new belief (set-theoretically) and then closes the result under logical consequence. So the result of revising \( K \) by \( p \) leaves Larry with the set of beliefs \( K' = \text{Cn}(\bigcap (K \perp \neg p) \cup \{p\}) \).

Lucky Larry’s revision process has a rather peculiar feature. If in his prior state \( K \) he believes \( \neg p \), then the posterior state \( K' \), i.e. \( K \) revised with respect to \( p \), will contain just \( p \) and everything which \( p \) entails (Gärdenfors, 1988, Corollary 4.10). Thus, if \( p \) is adopted on the basis of wishful thinking, the demon, by hypothesis, engineers the facts so that belief in \( p \) will be highly reliable. And from this it follows that in the posterior state all of Lucky Larry’s beliefs have a sufficiently high truth-ratio.

Suppose Larry’s epistemic state \( K \) supports a host of beliefs (all suitably time indexed) about his current surroundings, about the current weather (that it is rainy), about the status of the polar ice caps, and so on. Let us assume that all of these beliefs are justified according to the process-reliabilism story. He looks outside and sees that it is a rainy day. But Lucky Larry is planning a picnic, so on the basis of wishful thinking, adopts the new belief It is sunny now. So he must undergo a change in view. But using the method above, Larry’s posterior state is rather impoverished: it supports just the belief that It is sunny now and everything this entails. He has lost all of his other commitments, and this seems an unjustified belief change. Changing one’s view about the weather ought not make one forget

\[10\] Actually, let us identify \( K \) contracted with respect to \( \phi \) with \( \bigcap (K \perp \phi) \) when \( K \perp \phi \) is non-empty, and with \( K \) itself otherwise.

\[11\] Larry’s revision function is what is known as a full meet revision function. See Alchourrón, et al. (1985); Gärdenfors (1988).
everything else! But then we have a clear case in which beliefs supported by both 
$K$ and $K'$ are justified according to process-reliabilism, but the transition between 
them is intuitively an unjustified belief change. Thus, if process-reliabilism is the 
right account of justification construed as a property of beliefs, then the orthodox 
view cannot be right.

4.2. **Case two: Coherentism.** Consider the case of Coherent Cathy. Coherent 
Cathy is a very reflective epistemic agent, so much so that at any given time her 
doxastic state is in perfect equilibrium—she always has as many connections be-
tween her beliefs as she can, and she never has any synchronic incoherencies of 
any sort (at least with respect to her beliefs about medium sized physical objects).

Cathy is doxastically much more conservative than Larry—she gives up beliefs 
rather cautiously (she is, after all, a committed negative holistic coherentist).

This difference shows up in how she contracts or withdraws her commitments. 
Whereas Larry gave up too much, Cathy is much more tenacious. She realizes that 
when withdrawing her commitment to $\phi$ there are, as we remarked above in general 
many different ways of bringing about such a change. There are choices to be made. 
So she compares the candidate belief sets in $K \perp \phi$ by how little, comparatively 
speaking, they sacrifice beliefs which have positive, coherence-conducive features. 
She then selects the best one; the result of contracting $K$ by $\phi$ is $\gamma(K \perp \phi)$, where 
$\gamma$ is a function which selects the best of the maximal non-$\phi$-implying subsets of 
$K$.\textsuperscript{12} The second step of the revision process goes as before: she set-theoretically 
adds the new belief to the intermediate, contracted belief set and closes under 
consequence. So the result of revising $K$ by $p$, for Coherent Cathy, is the set of 
beliefs $K' = Cn(\gamma(K \perp \neg p) \cup \{p\})$.\textsuperscript{13}

Coherent Cathy’s revision procedure has a rather peculiar feature. If in her prior 
state $K$ she believes $\neg p$, then the posterior state $K'$, i.e. $K$ revised with respect 
to $p$, will be completely opinionated in the sense that for any proposition $q$ either 
Cathy will believe $q$ or its negation $\neg q$ (Gärdenfors, 1988, Corollary 4.6). In fact, 
her posterior beliefs are sure to be consistent. So her post-revision beliefs determine 
effectively one possible world. And, as long as we think that the whole truth about 
any given world is coherent, this means that her posterior doxastic state is sure to 
be coherent.

So suppose that Cathy, in state $K$, believes a host of things about her immediate 
surroundings, that her favorite coffee shop is open, about the state of the polar ice 
caps, and so on. But suppose that, in $K$, she is agnostic about whether Amsterdam 

\textsuperscript{12}Actually, let $K$ contracted with respect to $\phi$ be $\gamma(K \perp \phi)$ if $\phi$ is not a theorem, and set it to 
be $K$ itself otherwise.

\textsuperscript{13}Cathy’s revision function is what is known as a maxichoice revision function. See Alchourrón, 
et al. (1985); Gärdenfors (1988).
is larger than Rotterdam. As she walks toward her favorite coffeeshop, she sees that it is in fact closed, and has to revise accordingly. But using the method above, in her posterior state \( K' \) she now has a definite view about the relative size of Amsterdam as compared to Rotterdam. But learning that one’s favorite coffeeshop is closed ought not decide issues of comparative Dutch demography! Moreover, since her posterior belief set \( K' \) is deductively closed, there are as many relationships between beliefs in \( K' \) as can logically be. So we have a clear case in which beliefs supported by both \( K \) and \( K' \) are justified according to the coherentist, but the transition between them is intuitively an unjustified belief change. Thus, if coherentism of one stripe or another is the right account of justification construed as a property of beliefs, then the orthodox view cannot be right.

4.3. Case Three: Fallible Foundationalism. Consider the case of Fast Freddy. Fast Freddy is a thoroughly dedicated reasoner: at any given time he only believes things for which he has an undefeated argument. Fast Freddy, being fast, immediately sees all of the consequences—defeasible and conclusive alike—of the propositions he entertains, believes, conjectures, and so on. So, whereas for most of us reasoning proceeds at the speed of our computational resources, for Freddy reasoning moves at the speed of logic. If Freddy has good, undefeated reasons for a belief which are acyclic and terminate in an appeal to a bottom level belief (as he always does), then according to the fallible foundations theory he is justified in so believing. And this is so even though his reasoning is instantaneous.

Suppose Freddy in state \( K \) has basic, bottom-level beliefs \( q \) and \( q \rightarrow \neg p \). Of course, he also believes that \( \neg p \), but this need not be at the bottom level. Now suppose Fast Freddy’s sub-doxastic perceptual system delivers the new bottom level belief that \( p \). Freddy needs a mechanism to revise his set of bottom level beliefs (else he will believe everything). As a matter of fact, he uses just the method that Lucky Larry uses; viz., full-meet revision. But since he only uses it to tidy up his set of bottom-level beliefs, it does not cause quite as disastrous a problem—or, rather, the problem it causes is different. Where \( B \) is Freddy’s set of bottom level beliefs in state \( K \), he first contracts this with respect to \( \neg \phi \), and then set-theoretically expands by \( \phi \). Formally, \( B \) revised by \( \phi \) returns the base \( B' = (\bigcap (B \perp \neg \phi)) \cup \{ \phi \} \). Then Fast Freddy’s inference machinery takes over, operating on the revised set of bottom level beliefs, churning away the consequences both defeasible and conclusive to determine what Freddy believes—i.e., where \( \text{Bel}(\cdot) \) is Freddy’s inference operator, we have that \( K' = \text{Bel}(B') \).

Freddy’s way of tidying up his set of basic beliefs has a rather peculiar feature. In particular, it allows that defeasible, non-bottom level beliefs to persist where they ought not, and yet—and this is the key for us—this is so even while in the prior
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Suppose that Fast Freddy has the set of bottom level beliefs \( B = \{p, q, r, s\} \), and suppose that \( r \) is a defeasible reason for \( \neg p \) and \( s \) is a defeasible reason for \( \neg q \). If these are all the relevant facts, then Fast Freddy believes \( p, q, r, s \) (plus their deductive consequences). Call this state \( K \). Now Freddy gets the new, bottom level belief that \( \neg (p \land q) \). It is easy to check that \( B \perp (p \land q) = \{r, s\} \) and so the revised set of basic beliefs \( B' = \{r, s, \neg (p \land q)\} \). Fast Freddy then lets his reasoning run wild on this new base. But now he has no defeaters for the defeasible reasons from \( r \) to \( \neg p \) and from \( s \) to \( \neg q \). So, in \( K' \), he believes that \( \neg p \) and that \( \neg q \); each is in \( \text{Bel}(B') \).

We need to be clear about three things. First, in \( K \) each of Freddy’s beliefs is supported by an undefeated argument, and so ought be considered justified in our static sense (according to the fallible foundations theory). Second, the same is true for Freddy’s beliefs in the posterior state \( K' \), and in particular for his belief that \( \neg p \) and his belief that \( \neg q \). He believes the former because he has an undefeated defeasible reason from \( r \) to \( \neg p \) and \( r \) is a bottom level belief; similarly for \( \neg q \). Third, the change in view, nevertheless, seems unreasonable; learning that it either \( \neg p \) and \( \neg q \) when we antecedently took it for certain that both \( p \) and \( q \) should not leave us thinking that neither. But—and this is important—this epistemic shortcoming of Freddy’s has nothing to do with the structure of reasons in his epistemic state. So we have a clear case in which beliefs supported by both \( K \) and \( K' \) are justified according to the fallible foundations theory, but the transition between them is intuitively an unjustified belief change. Thus, if foundationalism (of the fallible stripe) is the right account of justification construed as a property of beliefs, then the orthodox view cannot be right.

4.4. A Final Case. It might be tempting to read any one of these three arguments not as an argument against the orthodox view but rather as an argument that some particular theory of justification in our static sense is not the right view. For example, seeing the problem with Lucky Larry, one might think as follows: given the orthodox view, this is just an argument against process-reliabilism as a theory of justification—after all, we have reliable prior and posterior states with an intuitively absurd transition between them. This reading of the facts is certainly possible, since one man’s modus ponens is another’s modus tollens. But I think that this is not a particularly plausible way of characterizing what we see.

First, we have not one but three arguments leveled not at one but at three otherwise quite different theories of justification construed as a property of beliefs of

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14 This example is adapted from (Rott, 2002, pp. 125–126); my use for it and his are quite different.
15 For the record, this sort of example is not problematic for my moderate foundations theory of epistemic change in Gillies (2002).
an agent at a time. And the diachronic considerations we have invoked in each case are basically the same: if $X$ is the right theory of justification in our static sense, then the orthodox view that positive synchronic epistemic properties determine positive diachronic epistemic properties cannot be right. Are we to think that these cases put pressure on reliabilism, coherentism, and foundationalism as an account of when a belief is justified? Maybe, but it is much more plausible to think that what is going on in these cases is that they collectively put pressure on the status of the orthodox view.

Let me just end by marshalling a final bit of evidence that the first dogma is mistaken. (This is the promised abstract–indirect argument.) Suppose we decide to deal not with whether a belief is justified at a time or not, but rather with the degree to which a belief is justified at a time, with degree 0 and 1 being the lower and upper bounds. This, of course, is exactly what Bayesian epistemologists do. Their basic theory says that $S$ is justified in believing $p$ to degree $d$ iff $S$'s degrees of belief constitute a coherent probability function $\text{Prob}(\cdot)$ and $\text{Prob}(p) = d$. The most famous argument that Bayesians give for this view, of course, is the Dutch Book argument—iff an agent’s degrees of belief conform to the probability calculus is she sure to avoid placing a set of bets (the odds on those bets being identical to her degrees of belief) such that, come what may, she has a net loss.

The Dutch Book argument, notice, is an argument about what the degrees of justification in our static sense ought to be, not about how an agent should change those degrees of belief. We may even suppose that there is an argument from within the Bayesian tradition showing that conditional degrees of belief must respect the standard definition of conditional probabilities, i.e. that $\text{Prob}(q|p)$ must be the ratio of $\text{Prob}(p \land q)$ to $\text{Prob}(p)$. Such an argument is, I think, given by de Finetti. But, as Brian (Skyrms, 1987, p. 3) points out, “None of this in itself, however, gives us a coherence argument for the rule of conditionalization for changing degrees of belief.” It simply leaves open how an agent ought to revise her degrees of belief. There is, however, another argument—the Dynamic or Diachronic Dutch Book argument—which aims to show that iff an agent updates her coherent probabilities by Bayes’s rule is she immune to a series of bets (over time) which, come what may, would result in a net loss for her.\textsuperscript{16} So the standard Bayesian canon is that, first, synchronically coherent epistemic states determine degrees of belief which match the probability calculus, and second, that changing those degrees of belief must be diachronically coherent in that the revision proceeds by way of conditionalization.

Now, if the orthodox view were right, then we should all be very skeptical about the Bayesian canon. For if it were true that the positive epistemic status of an

\textsuperscript{16}The argument is due to David Lewis, and is reported in Teller (1973).
epistemic state at a time determined the positive epistemic status of transitions between states, then the right account of justification construed as a property of beliefs would just determine the right account of epistemic change. But there is no such connection for the Bayesians since they (by consensus) need not only the Dutch Book argument but also its diachronic cousin the Dynamic Dutch Book argument. Whatever the troubles of the Bayesian story might be, we cannot count among them that they give two arguments instead of one. I take it that no one rejects Bayesianism on the grounds that it is argumentatively promiscuous. But we would if the orthodox view were right.

This is another instance of the general phenomenon to which I have been pointing: justification in the static sense does not determine justified changes in view, theories about the synchronic properties of epistemic states do not determine theories about the diachronic properties of those states. The received view that the positive epistemic status of a belief (or a doxastic state) at a time decides the positive epistemic status of transitions between epistemic states cannot be right. Justification construed as a property of transitions between epistemic states is, in an important sense, autonomous.
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