Models and Modals[*]

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1   Introduction

Pragmatists recommend that in approaching a problematic concept, philosophers should begin by examining the role of the concept concerned in the practical, cognitive and linguistic life of the creatures who use it. I'm interested in pragmatic accounts, in this sense, of the various modal notions we encounter in science—causation, probability, counterfactual conditionals, and so on. In this paper, I want to propose that these accounts should avail themselves of the vocabulary of theoretical models.

Although my concern is thus with the application of models to the study of modals in general, I have a special interest in the case of causation. In previous work, I've defended an 'agency' or 'manipulability' approach to causation. This approach links our possession of causal concepts to the fact that we are agents. In the version that I prefer, it is a pragmatic account, in the above sense. (It is also a perspectival account, in a sense I'll be trying to clarify further below.) Some writers (e.g., Pearl 2000, Woodward 2001) agree about the centrality of notions of agency and manipulation to an understanding of causation, but take the resulting view in a more realist or objectivist spirit. From my point of view, then, there are two groups of opponents—those who need convincing about the centrality of agency and manipulation in an account of causation in the first place, and those who need convincing only about the pragmatic or perspectival character of the best such account. In both cases, however, a pressing task is to clarify the perspectival option. That's what I'll be attempting here, with the aid of theoretical models.

Clarifying the perspectival option is a matter of locating it on philosophical maps—or, in some cases, redrawing the maps so as not to exclude it by default. Philosophers have a tendency to think of the question 'Is there any such thing as causation?' as on all fours with 'Are there any Tasmanian tigers?' or 'Are there magnetic monopoles?' This has the effect of simply excluding some views of causation, views according to which there are important differences between the question about causation and the questions raised by physics and natural history.

As an example of someone who appears to be missing the relevant possibility, consider this famous remark from Bertrand Russell:

> All philosophers, of every school, imagine that causation is one of the fundamental axioms or postulates of science, yet, oddly enough, in advanced sciences such as gravitational astronomy, the word 'cause' never occurs ... The law of causality, I believe, like much that passes muster among philosophers, is a relic of a bygone age, surviving, like the monarchy, only because it is erroneously supposed to do no harm. (Russell, 1913)

Russell seems to be arguing that physics has shown us that there is no such thing as causation—a discovery about what the world contains, apparently, on a par with those of natural history and physics itself. But I want to show that there's an important option that Russell thus overlooks. Extending Russell's own metaphor, I'll call it *causal republicanism.*

Consider the political case. When we reject the view that political authority is vested in our rulers by god, we have two choices. We can reject the notion of political authority altogether, or we can regard it, as republicans do, as vested in our rulers by us. The republican option exists in metaphysics, too, where it is an alternative to realism and eliminativism. In the case of causation, it is the view that although notions of causal power are useful, perhaps indispensable, in our dealings with the world, they are a category constructed by us, not provided by God.

In comparing causation dismissively to the monarchy, Russell seems largely blind to this republican possibility—a failing he shares, I think, with many of his realist opponents. In my view, thinking of eliminativism as the sole alternative to causal realism is like thinking of anarchy as the sole alternative to the divine right of kings. Thus I agree with Russell in rejecting a certain kind of realism about causation, but disagree about the relevance to this conclusion of the issue of the eliminability of causal notions from physics. For a republican, causation may turn out to be both ineliminable and anthropocentric. In my view, the best versions of the agency approach give causation this republican flavour.

As I noted above, my interest in agency accounts of causation is part of a broader concern with pragmatic approaches to the various modalities employed in science. There are deep connections among the modal notions, I think, and hence much to be learnt by considering them as a group. More importantly for present purposes, the points I want to make are more easily made for probability than for causation, the relevant landscape being simpler and better-known. In particular, there's a familiar debate about the relevance of physics to the question as to whether there are (non-trivial) chances or objective probabilities—in some ways, a probabilistic analogue of the issue raised by Russell. I think that that debate, too, often misses important parts of the landscape. But it's easier to explain why than for causation directly, because the landscape is so familiar. Dialectically, then, it makes sense to begin with probability.

Most of the paper will thus be concerned with probability. In the next section, I'll distinguish three conceptions of what we are doing in *modelling* probabilities. There are two aspects of this approach to flag at this stage, the first the three-way distinction itself, and the second the fact that it is couched in terms of the functions of theoretical models. The relevance of the three-way distinction is that one of these three conceptions is easily overlooked, and yet crucial, in my view, both in deciding what's right and what's wrong about Russell's claim, and in understanding the nature of modal perspectivalism.

As for the focus on models, I've said that I'm trying to call attention to, and clarify, a kind of pragmatic perspectivalism about modal notions. It would be possible to do this by talking about the functions of theoretical language. Expressed this way, however, the concerns of pragmatism and realism are apt to seem orthogonal. Pragmatists focus on language, realists on reality, and the two sides can easily seem to be talking past one another. Focussing on models makes it easier to find common ground. As we'll see, the kinds of things a modal pragmatist wants to say find natural expression as theses about the functions of models (for creatures in our situation). While on the realist side, issues about the use and role of theoretical models are already sufficiently in play to present the questions the pragmatist wants to raise as 'more of the same'. The result, hopefully, is a more accessible and more 'scientific' modal pragmatism—and a pragmatism with a less linguistic face, via models with a more human face.[1]

2 Probability—models and meta-models

Let's begin, then, with a question about probabilistic models. What are we modelling when model probabilities? Or, more neutrally, what is the function of probabilitistic models—what do we use them *for?*

I want to distinguish three different conceptions of the role of probabilistic models, especially in science. In each case, I want to be able to think about the relation of the models in question to the needs and characteristics of the *users* of those models. I want to be able to consider the relevance of variations in characteristics *of the users,* to the utility and possibility of their use of probabilistic models, under particular conceptions of what those models involve. In order to think about these issues in the abstract, idealised way typical in science, I want to be able to model them. So I'll need what I'll call *meta-models*—models of the users of probabilistic models. Here, then, are three possible views of the functions of probabilistic models, together with some remarks about the associated meta-models.

2.1 Objectivist models

On this view our aim in modelling probabilities is to model an aspect of the (modeller-independent) physical world. Probability is regarded as an aspect of the objective world, on a par with other features studied by physics. There are different views about what such objective probabilities are, of course. The options include propensies, hypothetical limiting frequencies of various kinds, and theoretical entities, not further specified, but picked out in virtue of their relevance to our decision-theoretic psychology—that aspect of the world, knowledge of which makes rational certain degrees of belief.

If probabilistic models are understood in this objectivist way, what can we

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[1]One important aspect of this shift from language to models is that it helps to distance us from naïvely representational conceptions of the role of theoretical language in science. Pragmatists are often foes of representationalism. While theoretical models are not inevitably conceived in anti-representational terms, it is uncontroversial that they can have non-representational functions (see, e. g., Morgan and Morris, 1999). Language wears on its face a representational complexion. Pragmatists want to argue that this complexion is no more than skin-deep—not a reliable guide to underlying function and structure—but the case is much easier to make if we start further from the surface.

say about the users of such models? How should we model such creatures, in our meta-models? There are two crucial points. First, the modelled creatures need to be modelled as *representers*—creatures whose modelling aims to 'mirror' some aspect of the world they inhabit. Second, their use of models of probability has to be seen as *attempting to represent* in this way—the models themselves must have a representational function. (The second point serves to rule out the case of users who, while representers in other ways, use their probabilistic models for some non-representational purpose.)

2.2 Subjectivist models

An alternative view is that in modelling probabilities our aim is to model psychological states—credences—to some feature of which the probability calculus is applicable, at least under idealisation. At least in a loose sense, then, this view holds that when we model probabilities, we model something subjective—some feature of our own minds.

What meta-models are appropriate in this case? As in the objectivist case, the modelled creatures need to be modelled as representers, whose modelling aims to mirror some aspect of the world they inhabit. In this case, however, the feature represented is part of their own psychology. Inter alia, then, they need to be creatures with the relevant psychology—creatures with credences. Note that this wasn't necessary in the objectivist case. If probabilities are part of mind-independent reality, then in principle creatures without credences ought to be able to model them, even if the part of reality thereby modelled needs to be characterised in terms of its relevance for creatures who do have credences.

A detailed subjectivist meta-model may be expected to tell us, among other things, how the relevant psychological states vary with perceived features of the creatures' external environment. (We're assuming here that the function of probabilistic models isn't just navel-gazing—somehow, that self-descriptive psychological modelling has some wider point.) Presumably such things as observed relative frequencies will be relevant at this point. But if subjectivism is to retain its main advantage over objectivism—that of avoiding the metaphysical and epistemological 'queerness' of modal facts, in favour of something commonplace, though psychological—these features had better be non-modal.

One point to emphasise. In the sense in which I'm using the term, subjectivist models of probability are 'self-descriptive'. They are models of the credences of an agent—of the user of the model, in fact, or some idealisation of the user. It is important to note that not all so-called subjectivist accounts of probability need be subjectivist *in this sense.* Some may be closer to the perspectival view I'm about to describe. And some, perhaps, may simply fail to distinguish between the two options.

2.3 Perspectival models

The third possibility is that what we model when we model probabilities is neither some mind-independent aspect of reality, nor an aspect of our own psychology, but rather the world 'as it looks' from the standpoint of such a credence-based psychology—we model a 'projection' from such a psychology. Of course, more needs to be said to make this notion precise. I've just used two metaphors, one visual and one projective. These are neither obviously compati-

ble, nor the only ones in play in this area. Later I'll introduce a third metaphor and say something about each, and their connections.

For the moment, however, we have enough to note some important points about the meta-model associated with this perspectival conception of first-order models. On the one hand, it has something significant in common with the subjectivist case, in that the users modelled in our meta-model need to be endowed with credences. On the other hand, there is something important that differs compared to both the previous cases, in that the users are not modelled as *representers.* The function of their first-order models is not representational.

One question we might appeal to meta-models to address is that of the utility of such non-representational models for the users concerned. To address such a question, we need to include enough 'environment' in the model, and enough detail concerning the users themselves, to explain how such modelling contributes to the well-being of such a creature in such an environment.[2] In principle this question can be asked in the representational cases, too, of course, though there we might expect it to have been addressed at a higher level of generality, rather than specifically with respect to probabilities.[3]

Thus we have three conceptions of the nature of probabilistic models, and three associated meta-models of the relation between such models and their users. This allows us to ask the question, which meta-model best fits *us?* Notice that this is an empirical question—a roughly formulated empirical question, to be sure, but in principle a matter to be investigated by science (indeed, by the human sciences, for it concerns an aspect of human linguistic behaviour and psychology).

Suppose it turns out that the perspectival option offers the best answer to this question. Then it would be seem to be a mistake to regard 'Are there really probabilities?' as itself an empirical question, on a par with 'Are there Tasmanian tigers?' or 'Are there magnetic monopoles?' Why? Because to read the question about probabilities in this way is to *presuppose* a representationalist conception of the functions of probabilistic modelling—the conception rejected in perspectival meta-models. In other words, it is to presuppose that what we are trying to do with our models of probability is the same kind of thing, roughly speaking, as we are trying to do with our models of Tasmanian megafauna or the quantum world, viz., to represent aspects of our external environment.[4]

In order to address the question as to which meta-model best fits our own practice, however, we need a better sense of what the perspectival option involves. Our next task is therefore to clarify the notion of a perspectival model.

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[2]Strictly, the perspective admits a range of options at this point. One, for example, is that the modelling has no particular advantage.

[3]Though it is relevant here that some standard answers seem inapplicable in some modal cases, given certain views of the nature of modal facts. There may be a puzzle about why modal beliefs are useful, for example, if they represent causally isolated possible worlds.

[4]I think this issue is actually more subtle than I here make it sound, because the contrast between representational and non-representational uses of models less clear-cut than this formulation assumes. However, I think the contrast between the functions of probabilistic modelling and other kinds of scientific modelling survives a more careful formulation.

3 What is a perspectival model?

Let's begin with three metaphors for perspectivalism, a visual metaphor, a projectivist metaphor, and a fictionalist metaphor. By combining elements of these three metaphors, I want to bring into focus what I take to be the core of an interesting perspectivalism.

3.1 The visual metaphor

The visual metaphor thinks of a perspective as like an aspect of reality *viewed from a particular standpoint.* Here standpoint usually means a spatial standpoint— what is perspectival is the view from a particular spatial location and orientation. But in principle it might include aspects of the observer's 'location' in a more general sense, such as aspects of her visual system. (The view through rose-coloured spectacles might thus be thought of as a particular perspective, for example.) This metaphor makes it is easy to see how models can be perspectival. We just think of a model as containing only what is visible from the viewpoint in question. Moreover, because the viewpoint in question is straightforwardly observer-dependent, the metaphor gives us an easy model of dependence on a contingent feature of an agent's circumstances—their spatial location, the colour of their spectacles, and so on.

On the other hand, the visual metaphor suggests that a perspective is merely an observer-dependent selection from a set of things which are—in themselves, so to speak—observer-independent. This wouldn't be true of all versions of this kind of perspectivalism—it is explicitly not true of Russell's (1914) construction of objects from perspectival sensibilia, for example. But where it is true it is unhelpful. The more interesting cases are ineliminably perspectival, in the sense that we can't achieve a non-perspectival description simply by including more.

3.2 The projectionist metaphor

The classic statement of the projectionist metaphor comes from Hume's distinction between the operations of reason and taste:

> Thus the distinct boundaries and offices of *reason* and of *taste* are easily ascertained. The former conveys the knowledge of truth and falsehood: The latter gives the sentiment of beauty and deformity, vice and virtue. The one discovers objects as they really stand in nature, without addition and diminution: The other has a productive faculty, and gilding and staining all natural objects with the colours borrowed from internal sentiment, raises in a manner a new creation. (Hume 1998, 163)

This metaphor has the great advantage, in my view, of calling attention to distinctive aspects of our psychology, relevant to the perspective in question— *that from which we project,* in effect. In the probability case, we know what this feature is: credence, in its raw or idealised form. But unlike subjectivism proper, which regards probabilistic models as models *of* our credences, this approach regards them as models of the projections of these psychological states—of the 'objectifications' of the credences, the 'new creations' with which our faculties gild reality.

Of course, this remains rather metaphorical, and what it means needs clarification. It might be phenomenological, for example, as it seems to be in Hume. It might be cashed out in more linguistic terms, as the construction of a practice of making claims and reasoning in ways which ultimately 'express' these credences. Or it might be cashed in the 'model model' itself, so that what projection really amounts to is the construction of models whose ontologies stand in the appropriate relationship to the inner states concerned. More on these options later. (It seems to me likely that the latter two options go hand-in-hand.)

For now, I want to call attention to what seem to me the twin advantages of the projectionist metaphor. Firstly, in calling attention to a distinctive aspect of our psychology from which we 'project', it identifies a contingent feature of the speaker that *grounds* the perspective in question. The identification of such a feature is absolutely central, in my view, to any interesting perspectivalism of this kind. Indeed, it is what makes it perspectival, for it is variation with respect to this 'contingent ground' that constitutes variation of perspective.

Note that we shouldn't assume that the relevant ground will always be psychological. In other cases it might be spatial or temporal location, for example. Or it might be location on some non-spatiotemporal scale of variability. (Some crude examples: when we call things hot or cold, tall or short, we are comparing their temperature or height to our own.) Whatever it is, the first important virtue of the projectionist metaphor is that it emphasises that perspectival modelling is a game creatures are equipped to play, in virtue of the fact that they possess or occupy the contingent ground in question.

The second virtue of the metaphor is its comparative clarity on the important issue of what distinguishes perspectivalism from subjectivism. Projection is coloured by 'internal sentiment' (or its analogues in other cases), but it is not a representation of those internal sentiments.[5]

Taken together, these two characteristics comprise the core of the most interesting notion of perspective, in my view. On the one hand, perspectival models (or concepts, or judgements) depend on some contingent feature or ground, possession of which is a precondition of use of the model, concept or judgement in question. On the other hand, such models, concepts or judgements don't *represent* that feature or ground, explicitly or implicitly. (The contingent ground of a perspectival judgement is always *backgrounded,* as we might say.)

3.3   The fictionalist metaphor

This metaphor has the advantage of helping to emphasise that the perspectivity belongs to the background, not the foreground. From within the perspective in question, its objects don't look perspectival. They simply look like objects. This is obviously the case in fiction—it is (almost always) inappropriate, within a fictional context, to portray its objects as fictions. Our fictions don't say, 'It was a dark and stormy and fictional night', except occasionally for self-consciously convention-busting effect. The label 'fictional' is imposed from the

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[5]However, more needs to be said at this point about the nature of the distinction—especially by someone who, like me, is inclined (see, e.g., Price 2004) to deny that there are any genuine representations, in anything more than a deflationary sense. The distinction requires careful attention to the relations between models and judgement, and to the differing assertion and rejection conditions for the judgements associated with self-descriptive and projective models.

outside, when we comment on the status of such objects.[6]

Of course, we don't want to banish perspectivity for ever. We want to be able to see it *as theorists,* for otherwise perspectivalism would have nothing to say. It gets back in when we ask why a particular fiction should be useful for *these* creatures in *those* circumstances. Perhaps a disadvantage of the fictionalist metaphor, compared to the projectionist metaphor, is that it does nothing to direct our attention to this issue. It would be easy to think of all fictions as on a par, and to fail to notice the ways in which particular fictions may be adapted to—indeed, dependent on—particular needs and circumstances.

A better stategy is therefore to combine this third metaphor with the second—to think of projection as production of fictional ontology, riding on the back of the various psychological and other commonalities that constitute the contingent grounds of the perspectival models in question. We thus ask, why is it useful for creatures occupying those grounds to invent such models? (Why ontology? And why talk of truth?) To make this work, fictionalism needs to have the flexibility to connect particular aspects of the fictions concerned to the relevant aspects of the user's circumstances. Uniquely among all fictions, for example, the fiction of chances needs to connect with credences in an appropriate way—a way that looks (from the inside, as it were) like Lewis's Principal Principle (Lewis 1980).

A further strategic advantage of the fictionalist metaphor is the way in which it connects with familar views about the functions of theoretical models in science. It is already well-recognised that models that are in some sense fictions may nevertheless play an important role in science. One version of this view is instrumentalism, which rejects a representationalist conception of the role of theoretical models altogether. Another version, less radical, recognises an important role for models embodying fictional idealisations in the context of a generally realist view of scientific theories. In a sense, my modal perspectivalist simply wants to give these ideas an extra degree of freedom—to suggest, for example, that the utility of instrumentalist models is a more complex matter than usually assumed, and may rely on particular contingent features of the users of those models, such as the fact that their psychology includes credences. My view thus compares to a kind of multifunctional fictionalism. Models are tools, and the kinds of tools we need depends on the kind of creatures we are.

The fictionalist metaphor has one significant disadvantage, from my point of view. Roughly, it is more anti-realist than it needs to be (or than I want to be). I'll return to this point at the end of the paper. Until then, I'm happy to ride in tandem with fictionalist views.

Summing up, then, we have three guiding metaphors for perspectivalism: the metaphor of visual perception from a particular viewpoint, the projectivist metaphor, and the fictionalist metaphor. I've suggested that the second and the

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[6]Note that we have a choice about how we put the observer into the fictionalist meta-model. We can put the observer in the fiction, modelling her as a representer of the objects which are fictional from our point of view but not from hers. Or we can model her as a user of (rather than a participant in) the fiction in question. If the meta-model is to represent ourselves, then clearly the latter approach is the right one—we don't want to model ourselves as merely fictional. But the former approach is also useful for some purposes. In particular, it gives us a way of thinking about what the perspective is like 'from the inside'—from the standpoint from which its fictional character is not apparent. How it seems to us is just how it would seem to those fictional creatures, who perceive real chances. In this case both the chances and the perceivers of chances are fictions, but fictions which tell us a lot about our own real phenomenology.

third are more useful than the first, and all the more so if they are combined, so that the source of the projection explains the genealogy and utility of the relevant fictions.

4   Perspectival models in science?

A republican view of causation or probability would agree with Russell that there is a sense in which these things are not among the constituents of the world discovered by physics, yet disagree that they should be banished from science. Republicans contend that despite their human origins, these modal notions may play a deep role in science. But how could this be? Isn't science supposed to reveal the world as it appears 'from nowhere', rather than the world as it appears from some particular human perspective?

Two initial responses to this concern. First, I want to note, but set aside for time being, the possibility of arguments that there can be no such thing as a non-perspectival description, a viewpoint genuinely 'from nowhere'. I set this aside not because I believe that no such argument is available. (On the contrary, as I'll explain.) But our present interest is in the contrast between modal and non-modal perspectives, and a global argument would be blind to this contrast.

Second, even if there were a view from nowhere, and it were the job of science to describe it, it might nevertheless be helpful to distinguish between 'pure' science, which did just this, and 'applied' science, which was allowed to be perspectival in various ways, in the service of distinctively human interests. Given such a distinction, it would be a legitimate question whether chance, causation, and the like fall on one side of it or the other. To understand the question, we need to be able to bring into focus the perspectival option. In other words, we need to be at home with the idea of modelling reality as it appears from some distinctively human perspective.

Again, the probability case is helpful. On the one hand, it is a case in which the philosophical landscape is sufficiently well-mapped for it to be relatively uncontroversial that non-objective probabilities have some place in science. On the other hand, it has enough connections to modality in general to serve as a gentle introduction to the possibility of a broader perspectivalism.

5   Perspectival probabilities

The analogue of Russell's claim for the case of objective probability would be that physics has shown that that are no such things. It is widely believed that this claim is false, because quantum mechanics has shown that there are objective probabilities. In the background here, however, is the view that this analogue of Russell's claim would have been true, if physics had turned out to be deterministic; and would still be true, if the right version of quantum theory (or its successor) turned out to be deterministic (as in Bohm's theory, for example, and other no-collapse interpretations of quantum mechanics). Even now, then, we should concede that Russell might turn out be right about chances—or so goes the orthodoxy.

However, it's not hard to see that the orthodoxy can't be the last word on whether probability has a serious role to play in science. It would be a scandal

if the issue of the legitimacy of uses of probability and probabilistic models elsewhere in science (and other aspects of everyday life) couldn't be settled until we knew whether the final microphysics was deterministic. So all these other uses of probability need to be explained in some other way.

Let's put this in terms of meta-models. Recall our three hypotheses from §2 about how we should model our own use of probability. The objectivist meta-model models us as creatures detecting and representing objective chances—features of the mind-independent world. The subjectivist meta-model models us as creatures representing features of our own psychology. And the perspectival meta-model models us a creatures modelling probabilities in some other non-representational mode (perhaps fictionally, for example). We know that the first hypothesis is a bad hypothesis, at least for all the uses of probability which don't show the right kind of sensitivity to the question as to whether final physics is deterministic. That leaves subjectivism or perspectivalism. The choice between subjectivism and perspectivalism isn't clear-cut, perhaps, and can't be, until perspectivalism is well-understood. So for time being let me lump them together, and use the term republicanism for both.

Thus the choices that Russell seems to allow in the case of causation—eliminativism or objectivism—can't be the only options for science in the case of probability. In that sense, probabilistic republicanism is not only on the table but dominates the table, in a way that it takes a perverse fixity of gaze to fail to see. And once it is seen, it ought to be seen as a threat. Whatever the right republican story in all the cases insensitive to final physics, what is to prevent it working in that case, too? After all, whatever it appeals to—our epistemic situation, for example—is also going to characteristic of the latter cases, apparently (if anything more so, because of the limits physics places on our knowledge). So the republicans at the table seem in danger of making the objectivists redundant.

This redundancy argument could be couched in terms of meta-models. The relevant comparison would be between (i) a meta-model of idealised epistemic agents detecting probabilistic states of affairs, which they then connect to relevant features of their own psychology; and (ii) a meta-model of creatures beginning with such a psychology, and such an epistemic situation, and then finding it useful to construct perspectival models in the appropriate relation to their psychology. It seems that even an objectivist about probability has to admit that the second meta-model is appropriate to all those cases, including cases in science, in which (by the objectivist's lights) there are no chances. It is hard to see how an appeal to a combination of simplicity and Occam could fail to recommend that the second model be applied universally. In other words, it is doubtful whether science *ever* needs genuinely objectivist models of probability.[7]

Perspectivalism has other attractions in this case. Beginning on the psychological or pragmatic side, it makes easy work of things that are often difficult for objectivists, viz., accounting for the epistemology and relevance of beliefs about probability. If there are chances, how can we know about them, and why does that knowledge have the significance it does for decision?[8]

It might be objected that there's a huge countervailing disadvantage. As the

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[7]For an interesting recent argument to a similar conclusion, see Strevens 2003, §5.6. I am grateful to Adam Elga for calling this to my attention.

[8]These are sometimes called the problems of upward and downward inference. They are closely related to what van Fraassen (1989) calls the identification and application problems.

objectivist might put it:

> What about the probabilities in quantum mechanics? Surely you're
> not going to claim that those are perspectival? What could be less
> perspectival than quantum mechanics—which, after all, is surely the
> best candidate we have for an account of what the world looks like
> 'from God's perspective', or 'from nowhere'?

For my part, I'm happy to bite this bullet. I'm happy to accept that at least as
standardly formulated, quantum mechanics embodies a perspectival description,
a description tailored to (an idealised version of) our own perspective—that of
creatures needing to predict and act for an uncertain future, on the basis of
knowledge of the past. In particular, I think that this is the right way to think
of the probabilities in quantum mechanics.

'But then what is reality *really* like?', my opponent might ask. At this point,
there are a number of options. One would be to argue that the question is in
any case impossible to answer, for familiar reasons. It's a familiar idea, accepted
by many realists,[9] that we know the world only under some structural descrip-
tion. But what goes into a structural description? If structure is always *inter
alia* modal structure[10]—if we know reality only in its causal and dispositional
aspects—and modal properties are perspectival in the way I'm suggesting, then
accepting that quantum mechanics is perspectival in this way is not a reason for
thinking of it as second-rate, compared to some achievable but less perspectival
theory.

The realist opponents I have in mind don't think that causal and disposi-
tional properties are perspectival, of course. My point is that they can hardly
object that a perspectival view of the modal properties on the grounds that it
leaves us cut off from the world in itself, because they too think we are thus
cut off. So if I had to live with the conclusion that we could know nothing
not 'tainted' with modal perspectivity, I could do so. And I'd have some near
neighbours in the realist camp.

In fact, however, I'm a little more optimistic. I think it's possible that
by thinking about the kind of world that would 'look like quantum mechanics'
from the perspective of creatures embedded in spacetime in the way that we are,
we have some sort of handle on the project of constructing a less perspectival
successor theory to quantum mechanics. The theoretical stance needed here is
the one provided by meta-modelling: a viewpoint sensitive both to the nature of

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[9]See Langton 1988 and Lewis, forthcoming—and also Worrall 1989, Zahar 1996, Ladyman
1998, French 1998 and French and Ladyman 2003, for similar views in the philosophy of
science. Although all these authors agree, roughly speaking, that we know the world only in
its structural aspects, French and Ladyman differ from the others in thinking, in effect, that
structure is all there—that fundamental ontology lies at the structural level. In their version,
then, there is no world from which knowledge of structure alone leaves us cut off, but nor,
therefore, is there any room for the present objection to my modal perspectivalism. From my
point of view, then, the two versions of this structuralist view are equally useful.

[10]Cf. this recent characterisation of structural realism by French and Ladyman:

> [T]here is a minimal metaphysical commitment that we think structural realism
> ought to entail. This is that there are mind independent *modal* relations between
> phenomena (both possible and actual), but these relations are not supervenient
> on the properties of unobservable objects and the external relations between
> them, rather this structure is ontologically basic. (2003, 45–46, my emphasis)

the world and to the nature of the creatures who inhabit that world, in order to address the question as to why *those* creatures should model *that* world in *this* way—i.e., the way exemplified by quantum mechanics, as we have it today.[11]

For me, then, the appeal to quantum probabilities in support of objectivism cuts neither ice nor mustard. As I've already noted, I think the appeal of objectivism about probability in science rests, at best, on a rather blinkered view of the options. In a more extended treatment of these issues, I'd back up that assessment by appealing to more local arguments for subjectivism about quantum probabilities. For example, Jenann Ismael (1996) argues that the common assumption that quantum probabilities are intrinsic physical properties is incompatible with many standard views of the nature of chance—in particular, those views which allow that the chance of an event at a time supervenes on the history of the world at later times. If we give up supervenience to avoid this conflict, we inflate our metaphysics at the cost of our epistemology. In effect, we worsen the problems noted earlier of explaining and justifying upward and downward inference to chances. (As Ismael (1996, 89) puts it, 'the injection of metaphysics . . . goes against empiricist inclinations'.)

Ismael goes on to suggest that an injection of subjectivism offers a much better prognosis. I agree, and I think the point generalises. In general, perspectival models of probability—which provide a better way of introducing subjectivity than the self-descriptive subjectivist models we considered in §2—make easy work of things that are difficult for objectivist approaches. In particular, they avoid the epistemological and pragmatic problems mentioned earlier—How can we know about chances, and why do they have the relevance they do for decision? And they do well in explaining other oddities of chance, such as its apparent time-asymmetry.

What happens to the analogue of Russell's claim for the case of probability, if we accept this perspectival account of the probabilities in quantum theory and elsewhere? Two essential points. First, Russell is right in thinking that there are no chances objectively construed. But second, he is wrong to think that talk of probabilities only passes muster because we fail to see what is wrong with it. What he misses is the republican option. Probability passes muster as a notion we ourselves bring to our models of the world—a possibility that requires that we see ourselves as Kant does, as conceptual creators, not as mere consumers of conceptual categories pre-packaged by God.

6   Modelling modalisers

I said at the beginning that I wanted to use probability as guide to the general case, including causation. I don't have space here to try to provide details, but it should be clear how the program goes. We aim for a meta-model of a modal agent—a creature embedded in time, from whose epistemological and decision-theoretic perspective, modal talk makes sense.

In the case of causation, as I noted at the beginning, an attractive idea is that the agent's perspective is crucial. This idea has appealed to many people,

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[11]When I'm very optimistic, I think that the answer might point to a theory less puzzling than quantum mechanics itself, from a realist's point of view. If so, then the satisfying moral would be that excessive realism about modal notions had actually stood in the way of a satisfactory realist interpretation of quantum phenomena.

one of the first of them Ramsey. As Ramsey puts it, 'from the situation when we are deliberating seems to ...arise the general difference of cause and effect.' (1929, 146) In order to make good this idea, our task as meta-modellers is to show how modelling the world in causal terms serves the interests of creatures we model as abstract agents, embedded in a non-causal environment. (In other words, we don't include causation in the model environment of the creatures represented in our meta-model, but the meta-model aims to show how it is useful for these creatures to include it in their models.)

Two further comments. First, as I've argued elsewhere (Price 1991, 1992a, 1992b, 1996, 2001), one of the striking advantages of this perspectival approach to causation is that offer a coherent account of the origins of the asymmetry and temporal orientation of causation. Roughly, it is a projection of our own temporal asymmetry as agents—again, this is something we could use our meta-models to make more precise. As in the probability case, abandoning objectivism for perspectival thus offers light work in place of heavy weather.

In fairness to Russell, it should be noted that he himself is clearly aware of some of the relevant considerations here. In discussing the origins of our intuition that the past is fixed and the future open, he says that 'there seems no doubt that the main difference in our feelings arises from the accidental fact that the past but not the future can be known by memory.' (1913, 203) We might quibble about the way Russell expresses this. Roughly, it is only accidental that the past and not the future can be known by memory if we interpret the terms as rigid designators, picking out the same temporal direction in worlds in which our own physical orientation is reversed. It is plausible that in that imagined case, we would still use the term 'past' to pick out the direction we remembered. But that semantic point aside, Russell is evidently aware of one of the key contingencies about us, which seems bound to play centre-stage in an explanation of the modal perspective.

The second comment is that there is no reason to be troubled by the fact that in conducting these investigations—in thinking about the usefulness of causal and modal notions for creatures like us—we are employing those very modal notions. For example, we are thinking about how our lives *would be,* if we didn't employ counterfactual reasoning. But this circularity is surely not vicious. On the contrary, it simply serves to confirm that there is little or no interesting science that is free of perspective, in the deep sense associated with the modal categories. If it is science itself that reveals this to us, how are objectivists to respond? By claiming that in this respect science is not to be trusted, and that philosophy offers deeper insights?

7   Why I am not a fictionalist

I noted earlier that although the perspectival viewpoint could usefully be compared to fictionalism, I wanted to distinguish my own version of the view from fictionalism. The easiest way to explain this point is to explain the analogous distinction between my view and orthodox noncognitivism or quasirealism (Blackburn 1993), and then transpose.

A noncognitivist or quasirealist typically makes two claims about the functions of the target discourse—evaluative language, for example. One claim is positive, the other negative. The negative claim says that the terms or

statements characteristic of the discourse lack some semantic property. They are non-referential, non-truthconditional, non-descriptive, non-factual, or something of the kind. The positive claim offers an alternative account of their functions of the language in question—for example, that it expresses, or projects from, evaluative attitudes. Thus we might say that the negative claim is *anti-representational,* the positive claim *expressivist.*

My version of expressivism keeps the positive claim and throws away the negative claim. As I have argued elsewhere (Price 2004), this combination seems obligatory if we are deflationists about the relevant semantic notions. For to be a semantic deflationist is to believe, inter alia, that semantic notions play no substantial theoretical role. If that's true, such notions can't play a substantial role in the characterisation of a philosophical position, and the negative claim must be empty of theoretical content. Contrary to received wisdom, then, semantic minimalism is a friend and not an enemy of expressivism.

In other words, ignoring a few bells and whistles, semantic deflationism commits us to a kind of global expressivism. Why? Because without substantial semantic notions to underpin representationalism—to underpin the claim that some discourses are 'genuinely' realist, or factual, or cognitive, or whatever—all that's left to us as linguistic theorists are non-representational accounts of the functions of those discourses. What's left to us, in other words, are the kinds of accounts that noncognitivists and quasirealists have offered locally, in telling the positive part of their story. (Again, all of this could be cast in the terms of meta-models. There, the point is that if representation is not a substantial theoretical notion, perspectival meta-models are all that we have left.)

So am I a quasirealist? Yes, in one sense, for I endorse the quasirealist's project of explaining why expressively-grounded talk takes what are usually seen as realist forms—why it is treated as truth-apt, for example. But no, in another sense, for in endorsing this project globally, I reject the view that there is any bit of declarative language for which this is not the appropriate theoretical perspective. Hence, in effect, in claiming that there is nothing else, I reject the basis for the label 'quasi'.

In one of his late papers (Lewis 2004), David Lewis argues that quasirealism is essentially fictionalism. I agree, more or less. If there is a difference, it is that in the case of fictionalism the negative claim is more naturally cast in ontological rather than semantic terms. Instead of saying with the quasirealist that evaluative talk is non-referential, the fictionalist may say simply that there are no values. But in this case I distinguish myself from fictionalism just as before, except that the necessary deflationism is ontological, rather than semantic. I think that if, with Carnap (1952), we reject the idea of an ontological standpoint external to our linguistic practices, then there is no viewpoint from which we can properly say that there are no values. Of course, the Carnapian point cuts the other way, too. There is no distinctively philosophical viewpoint from which we can say that there are values. What we are left with is a kind of internal, minimal realism, combined once again with a global expressivist standpoint (which is where all the interesting theoretical work takes place).

Note that Carnap does not require that we reject the fictional–non-fictional distinction altogether. On the contrary, as one of his own examples illustrates. Discussing what he calls 'the thing world'—'the spatio-temporally ordered system of observable things and events' (1952, 210)—he says:

> Once we have accepted this thing-language and thereby the frame-work of things, we can raise and answer internal questions, e.g., 'Is there a white piece of paper on my desk', 'Are unicorns ... real or merely imaginary', and the like. These questions are answered by empirical investigations. (1952, 210)

So Carnap is happy to allow us to distinguish fictional unicorns from real wombats or extinct Tasmanian tigers. However, he stresses that 'from these [legitimate, internal ontological] questions we must distinguish the external question of the reality of the thing world itself'. He notes that this is the kind of question metaphysicians take themselves to be addressing, but argues that

> it cannot be solved because it is framed in the wrong way. To be real in the scientific sense means to be an element of the framework; hence this concept cannot meaningfully be applied to the framework itself ... The thesis of the reality of the thing world ... cannot be formulated in the thing language or, it seems, in any other theoretical language. (1952, 210–211)

Among the metaphysical positions thus disallowed is a *global* fictionalism about the entities of the thing-world. And similarly in the modal case, it seems to me: Carnap's view is quite compatible with *local* kinds of fictionalism about causation, chance, and the like. It allows us to say that the causes and probabilities that occupy Sherlock Holmes' attention are as fictional as the man himself. What is excluded is global fictionalism about the entire causal or probabilistic framework, of the kind advocated by those who call themselves fictionalists about causes, chance and modality.

Within the philosophy of science, a useful comparison for the resulting position is with Arthur Fine's deflationary realism, encapsulated in what he calls the Natural Ontological Attitude (Fine, 1984). With one crucial qualification, Fine's souped-down realism suits my modal perspectivalist very well. The qualification is that there is one respect in which my view is very much less quietist than Fine's—one respect in which it envisages an important role for philosophy, albeit not the traditional metaphysical role. This concerns the recognition that different models may do very different work for us, being projections from very different contingent grounds. But the standpoint from which we draw such distinctions is not that of a traditional ontologist or metaphysician (opponents I share with Fine). It is that of the psychologist, the linguistic and the anthropologist, reflecting on aspects of human thought and behaviour.

Summing up, then, these are my reasons for distinguishing my view from fictionalism. Like non-cognitivism, fictionalism makes two claims about the function of the talk in question, a positive claim and a negative claim. I reject the negative claim—whether couched in semantic or ontological terms—on deflationist grounds. Deflationism thus leaves me without the theoretical vocabulary or standpoint required to say that the talk is question is fictional. What's left, by default, is a kind of minimal realism—though a pluralistic realism, which insists that different models may do different kinds of jobs.

8   Meta-models and metaphysics?

In distinguishing my view from fictionalism, I've relied on a deflationary attitude to metaphysics. But it might be argued that meta-models provide what we need to reinflate things—to draw the distinction between cases in which realism is appropriate and cases in which it is not. Haven't I myself suggested as much, in effect, by noting that in the case of modality, we don't need to put modal facts in the modelled environment, in order to explain the modal talk of creatures modelled in our meta-models of modallisers?

This is an important objection, which needs more detailed treatment than I can give it here. Briefly, I think that although we can usefully highlight degrees of perspectivalism in this way, there is no non-perspectival view at the end of the tunnel. The most persuasive argument for this conclusion, in my view, is that the phenomenon of generality in language always supplies an ingredient which we don't need in the modelled environment, in order to account for linguistic practice. Models and theories are always tools we plan to apply in new cases. That's why we have them, as implements with which better to face an unknown future. At any given stage, however, we don't need those unknown cases, in order to account for the models, concepts or theories we currently possess. *All* models, concepts and theories thus reach beyond what we need in the environment, to explain the fact that we possess them. And nothing counts as genuinely representational, if this is our test.[12]

It is worth noting that even if the proposed test did succeed in distinguishing a class of non-perspectival models, it is far from clear that the result would necessarily count as realism. Another possibility, apparently, would be a kind of two-dimensional instrumentalism. Imagine that all scientific language is construed instrumentally, in something like van Fraassen's (1981) sense. That is, the only relevant epistemic attitude is what van Fraassen calls acceptance, not belief. (Perhaps we have decided that there are no genuine beliefs, in van Fraassen's sense, on the grounds that we are semantic deflationists.) Within this instrumentalism, there might then be a place for an additional, orthogonal dimension in which models and theories could count as instruments—the dimension associated with perspectivalism (and the idea that particular conceptual instruments have specialised functions, related to particular needs and capacities). The upshot would be that even if some model and theories were entirely non-perspectival, and hence had no second-dimensional instrumental role, they would remain instrumental in the original sense. Realism would remain out of reach.

9   Conclusion

I've suggested that the vocabulary of theoretical models provides a helpful vehicle for pragmatist approaches to the modal notions in science, as to other topics. The value of models is that they tend naturally to bring the foreground the issues of function, use and role in practice, on which pragmatists want to focus—and

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[12]This argument is closely related to the claim that the Wittgensteinian rule-following considerations provide an argument for global non-factualism—that is, they reveal a dimension of perspectival contingency which is ineliminable from language. See Price 1988, 1998 and Pettit 1991 for views of this kind.

at the same time (what's really the other side of the same coin) downplay the naïve representationalism that pragmatists see as such an impediment to good philosophy.

Using this model vocabulary, I've tried to delineate the kind of perspectivalism I take to be particularly promising in the modal case, and perhaps especially in the causal case. It is this kind of perspectivalism that I take to provide the best template for an account of causation in terms of agency and manipulation. While I haven't said enough, probably, to convince the two groups of opponents I mentioned at the beginning—those who agree about the importance of manipulation but want to think of it in more objectivist terms, and those who disagree about manipulation altogether—I hope I have made it clearer what the argument is all about. I hope I've also established that the debate about causation connects with much broader issues, in several directions—about other species of modality employed in science, for example, and about the range of options for a philosophical account of any such notion. In particular, while I may not have converted anyone to causal republicanism, I do think I've shown that it belongs on the philosophical map.[13]

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