Ceteris Paribus Laws [1]

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I

A *strict* law of nature might tell us that F events always cause G events, or that every F event has such-and-such objective chance of causing a G event. A *ceteris paribus law*, if there are any, might tell us that F events cause G events *ceteris paribus*, or, to confine expression to a single language, that F events cause G events *all other things being equal*.

Some philosophers believe that there are ceteris paribus laws and that without them there would be no special-science explanations, and hence no special sciences. These philosophers think that science is in the business of providing scientific explanations, that such explanations require laws, and that there are no, or only very few, strict special-science laws; whence their appeal to ceteris paribus laws.

I say 'these philosophers', and I know there are many, but I particularly have in mind a colleague who is *especially* fond of ceteris paribus laws, and especially concerned to stress their importance in commonsense psychology and in those departments of cognitive psychology that are refinements of the folk theory. Jerry Fodor wants to account for the causal-explanatory role of psychological properties, and he thinks that to do this those properties must occur in psychological laws. At the same time, he recognizes that those laws aren't "strict", in that they don't have completions in the language of psychology. But that's OK, he says, because they are correct ceteris paribus laws, which is all that's needed. In this respect, he further says, psychology, both commonsense and scientific, is in the same boat as any other special science. He even goes so far as to say that

> Strict laws and [ceteris paribus] laws with satisfied ceteris paribus conditions operate alike in respect of their roles in covering causal relations

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> and in respect of their roles in covering law explanations. Surely this is as it should be: Strict laws are just the special case of [ceteris paribus] laws where the ceteris paribus clauses are discharged *vacuously*; they're the [ceteris paribus] laws for which "all else" is *always* equal. (Fodor 1989, p. 75)

When I first decided to write about ceteris paribus laws, I naively thought I would discourse generally on their status wherever their presence has been claimed—in commonsense theories, in the special sciences, and even in physics. I soon realized, though, that I would do best to stick closely to the science that is my area of greatest expertise, folk psychology, and to give this paper the following structure. In the next section, after clarifying the issue, I shall offer reason to doubt that there are commonsense psychological ceteris paribus laws. In the section after that, I shall say something about why no such laws are needed to account either for the truth of commonsense explanations or for the explanatory role of psychological properties. And in a very brief final section I shall close with a word about the null role of laws in at least some special sciences.

II

My trouble with psychological ceteris paribus laws is that I doubt there are any. There are ceteris paribus *sentences*, to be sure, but the question is whether they express *propositions* and whether, if they do express propositions, those propositions are, or suitably determine, laws.

The sentence

[1] If a person wants something, then, all other things being equal, she'll take steps to get it

is deceptive. It looks as though it's expressing a determinate proposition, because it looks as though 'all other things' is referring to some contextually determinate things and 'equal' is expressing some determinate relation among them. But one would be hard pressed to say what the "other things" are and what it is for them to be "equal". Yet if 'all other things being equal' doesn't make a bona fide contribution to a proposition expressed by [1], then [1] is really tantamount to

> If a person wants something and ..., then she'll take steps to get it,

which is good for nothing, as it expresses no complete proposition, nothing that could even be believed, let alone play some explanatory role. So the first task of someone wishing to maintain that folk psychology has ceteris paribus laws is to say what's meant by ceteris paribus sentences. What, exactly, is the nature of the proposition expressed by '*M*s cause *B*s all other things being equal'?

The second task is to show that the truth of the propositions expressed by ceteris paribus sentences determines anything worth calling laws; for we don't show that there are ceteris paribus laws merely by showing that ceteris paribus sentences express truths. This can be made clear by considering the following propositions:

If all you know about someone is that she wants something, then it's reasonable for you to have some expectation that she'll take steps to get it.

A person's wanting something can explain her taking steps to get it.

People typically take steps to get what they want.

Plainly, we wouldn't have shown that [1] expresses a "ceteris paribus law" merely by showing that it expresses any one of these three true propositions. Philosophers who think it important to assert the existence of ceteris paribus laws intend to be saying something that goes beyond what anyone would accept; whatever they mean by a ceteris paribus law, it's not supposed to be something we have all trivially acknowledged under another description. The issue of ceteris paribus laws is interesting because the claim that such laws exist is intended to explain such things as the explanatory role, or "causal relevance", of the notions that allegedly occur in them (see Le Pore and Loewer 1987, 1989 and Fodor 1989).

So the questions, then, are these: First, what true proposition is expressed by the sentence '*M*s cause *B*s ceteris paribus'? Second, does that true proposition determine anything worth calling a psychological *law*?

One possible answer to both questions—an answer nowadays in disfavor—is that folk psychology's ceteris paribus laws have completions either in the commonsense vocabulary of that very theory or in the technical vocabulary of its scientific refinement, cognitive psychology. It may be useful to think of this proposal as deriving from two others: first, that special-science ceteris paribus laws have completions in the vocabularies of the special sciences to which they belong, and second, that for our purposes cognitive psychology and folk psychology are overlapping departments of a single special science (i.e. we don't want to say that cognitive psychology is a more *basic* theory in the way that, say, neurophysiology is more basic than intentional psychology).

Thus, Paul Churchland once suggested that

[2] $(\forall p)(\forall q)$(if one believes p & believes [that if p, q], then—barring confusion, distraction, etc.—one believes q)

is a law of folk psychology (Churchland 1981, p. 71). Of course, the little word "etc." makes this not a law but at best a partial specification of one. What Churchland intended, however, was that by adding to the 'barring confusion, distraction' list in an obvious way, we could get a closed sentence that did express a true law (or at least a law that is true if folk psychology is a correct theory).

I shall mention just one problem with the completion-within-intentional-psychology proposal. A creature with beliefs is a creature whose beliefs are realized in underlying physical states—brain states, if we are the creatures. Let Φ_1 be the physical state that in Ralph realizes the belief that it rained last night, let Φ_2 be the physical state that realizes the belief that if it rained last night, then the terrace is wet, and let Φ_3 be the physical state that realizes the belief that the terrace is wet. Putting this together with what [2] says, we know, as it were, that if Φ_1 and Φ_2 are instantiated in Ralph, then, ceteris paribus, so is Φ_3. Thus, there are physical mechanisms that account for the connection between, on the one hand, the joint instantiation of Φ_1 and Φ_2, and, on the other hand, the instantiation of Φ_3, and

these physical mechanisms are defeasible. The quesion now to be addressed is precisely this: Will *every* nomologically possible physical defeater of these physical mechanisms itself realize a *psychological state*, such as confusion, irrationality, or distraction, that could take its place in a wholly *psychological* true completion of [2]? Clearly, if the answer is no, then the present proposal—that folk psychology's ceteris paribus laws have *psychological* completions—is false. But, I submit, no is the most plausible answer. First, it seems to me that the burden of proof should be on the theorist who would claim that every physical defeater determines a psychological defeater, and in his own defense this theorist could hardly appeal to either commonsense or scientific psychology's great success in cashing ceteris paribus clauses. Second, brain-injured people of the kind observed by Oliver Sachs appear to give empirical evidence that there are breakdowns in normal cognitive processes which can't be accounted for in psychological terms. And third, the present proposal about psychological ceteris paribus laws can hardly be plausible if it isn't plausible that special-science ceteris paribus laws have completions in the vocabularies of the special sciences to which they belong, and there is evidently good reason not to find this plausible. As Jerry Fodor has written:

> Special science laws are unstrict not just de facto, but in principle. Specifically, they are characteristically *"heteronomic"*: You can't convert them into strict laws by elaborating their antecedents. One reason why this is so is that special science laws typically fail in limiting conditions, or in conditions where the idealizations presupposed by the science aren't approximated; and, generally speaking, you have to go outside the vocabulary of the science to say what these conditions are (Fodor 1989, p. 78).

The realization that special-science ceteris paribus laws don't have completions in the special sciences to which they belong suggests another solution: that they have completions in more basic sciences. This is in fact the view of Jerry Fodor, who may be allowed to speak for himself:

> Exceptions to the generalizations of a special science are typically *inexplicable* from the point of view of (that is, in the vocabulary of) that science. That's one of the things that makes it a *special* science. But, of course, it may nevertheless be perfectly possible to explain the exceptions *in the vocabulary of some other science*. In the most familiar case, you go "down" one or more levels and use the vocabulary of a more "basic" science.... The availability of this strategy is one of the things that the hierarchical arrangement of our sciences buys for us. Anyhow, to put the point succinctly, the same pattern that holds for the special sciences seems to hold for commonsense psychology as well. On the one hand, its ceteris paribus clauses are ineliminable from the point of view of its proprietary conceptual resources. But, on the other hand, we have—so far at least—no reason to doubt that they can be discharged in the vocabulary of some lower-level science (neurology, say, or biochemistry; at worst, physics). (Fodor 1987, p.6)

But how exactly are we to cash the proposal that special-science ceteris paribus laws have completions in more basic sciences? Fodor's proposal—in words

that bring it directly to bear on folk psychology—seems to be that the proposition expressed by a true commonsense psychological ceteris paribus sentence of the form '*M*s cause *B*s ceteris paribus' is that

[3] $(\exists C)(C$ is a condition specifiable in the language of some more basic science (e.g. neurophysiology) & it's a law that *M*s cause *B*s when C is satisfied).

And while [3] itself is not a law, we are arguably entitled to appeal to ceteris paribus laws if ceteris paribus sentences express truths of this kind. But there are two problems with the claim that [3] reveals the form of the truth expressed by a folk-psychological ceteris paribus sentence. First, there is reason to doubt that there are such truths, because there is reason to doubt that there are laws of the kind [3] requires. Second, even if there are some such laws, the ceteris paribus theorist should not want to regard [3] as a necessary condition for the truth of a ceteris paribus sentence.

If it's a law that *M*s cause *B*s when C, then this can't be because it's a law that Cs cause *B*s; that is, it can't be because satisfaction of C is itself nomologically sufficient for the occurrence of a B event. For if that were so, then the mental property M would be causally superfluous, and one would have no right speaking of a *psychological* law that *M*s cause *B*s ceteris paribus. If it's a law that *M*s cause *B*s when C is satisfied, then the more basic condition C can't render the mental property M nomologically superfluous. Let's put it this way. Instead of saying it's a law that *M*s cause *B*s when C is satisfied, we'll say that M-&-C is nonsuperfluously causally sufficient for the occurrence of a B event, where the "nonsuperfluous" qualification tells us that while the conjunctive condition is causally sufficient, neither of its conjuncts is. Throughout it will be understood that M is a mental condition, C is some appropriate more basic condition (e.g. a neurophysiological condition), and B can ride without restriction.

But how can a conjunctive condition made up of a psychological condition and (let us suppose) a neurophysiological condition be causally sufficient in this way? How can properties from different scientific levels mix in this way? The intended answer, I believe, is that the conjunction of psychological M and neurophysiological C is causally sufficient for a B event because there's a neurophysiological condition C' such that (i) C' realizes M and (ii) the conjunction of C' and C is causally sufficient for the occurrence of a B event.[2]

But this answer won't do. The fact that M has *a* realization whose conjunction with C is causally sufficient for a B event doesn't begin to show that M-&-C is causally sufficient for a B event. What would need to be shown is that *every* physically possible realization of M that could cohere with C would form with C a

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[2] Actually, this can't really be the intended answer if strict laws are available only in fundamental physics. The more cautious view, for someone who thinks that nonbasic sciences are ceteris paribus all the way down to fundamental physics, is that the value of 'C' that makes [3] true *must* be a condition statable in the language of fundamental physics. Pressing this point, however, would only make the position in question seem hairier than it is, and for present purposes I shall go along with the pretense that neurophysiology may yield causally sufficient conditions for the occurrence of a B event.

conjunctive condition that was causally sufficient for a *B* event.[3] Yet that seems questionable given what we know about the *multiple realization* of mental states. Mental states are multiply realizable in so many different ways—both in the same and in different kinds of underlying hard- or wetware—that indefinitely many kinds of physical states can realize them: for example, all it takes for an underlying state to realize an intentional state is that it have a relevant functional role and stand in the right sort of causal relations to distal objects and properties. It would seem that for any mental property *M* and relevant underlying condition *C*, there could be a realization of *M* that coheres with the satisfaction of *C* but whose conjunction with it fails to yield a causally sufficient condition for the occurrence of a *B* event. So I think that the multiple realization of mental states makes it questionable that there are laws of the kind [3] requires.

Even if there are *some* such laws, the ceteris paribus theorist should hesitate to claim that *M*s cause *B*s ceteris paribus *only if* there is some "lower-level" condition *C* such that *M-&-C* is nonsuperfluously causally sufficient for the occurrence of a *B* event—that is, only if there is some lower-level condition *C* such that *every* nomologically possible realization of *M* that can cohere with *C* will mesh with *C* to form with it a causally sufficient condition for the occurrence of a *B* event. For suppose that, although there is no condition *C* of the kind [3] requires, it is the case that for every possible realization of *M* there is some same-level condition that conjoins with the realization to form a nomologically sufficient condition for the occurrence of a *B* event. Shouldn't that intuitively entitle one to assert that *M*s cause *B*s ceteris paribus? This suggests a second way of cashing out the idea that folk-psychological ceteris paribus laws have lower-level completions.

The problem with requiring there to be some lower-level *C* such that *M-&-C* is nonsuperfluously causally sufficient for the occurrence of a *B* event is that, whatever *C* is, we can't rule out that *M* may be realized by an underlying state that doesn't itself conjoin with *C* to yield a causally sufficient condition for the occurrence of a *B* event. Why not, then, just require that the realization can co-occur with *some* other more basic condition to form a condition that's causally sufficient for the occurrence of a *B* event? This revision issues in the new proposal that

> *M*s cause *B*s ceteris paribus if for each realization *D* of *M* there is a same-level condition *C* such that *D-&-C* is nonsuperfluously causally sufficient for a *B* event.[4]

This proposal, however, confronts a major and a minor problem. The minor problem is that there may be some realizations of *M* for which there are no rele-

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[3] The "coherence with *C*" clause isn't gratuitous—it's not required that every physically possible realization of *M* forms with *C* a conjunctive condition that is causally sufficient for a *B* event. For to say that it's a law that *M*s *cause Bs when C* is to say that there is no nomologically possible world in which *M-&-C* obtains but *B* doesn't. Consequently, we need only to look at realizations of *M* whose conjunction with *C* is nomologically possible.

[4] This account still allows exceptions to the generalization that *M*s cause *B*s, for satisfaction of its right-hand side does not entail that a realization's completing condition *C* will be satisfied whenever the realization is instantiated.

vant conditions C; after all, certain realizations of M may themselves be among the defeating conditions alluded to in the ceteris paribus clause. Perhaps, though, this problem can be dealt with by something along the lines of this:

> [4]   *Ms cause Bs ceteris paribus iff for each of "sufficiently many" realiza-tions D of M there is a same-level condition C such that D-&-C is non-superfluously causally sufficient for a B event.*

This, however, doesn't obviate the major problem, which is that this proposal as to what's meant by a ceteris paribus sentence doesn't warrant talk of *psycholog-ical* ceteris paribus laws. The only laws alluded to in [4] are ones (perhaps only of fundamental physics) which tell us that the *non*psychological condition D-&-C is nomologically sufficient for the occurrence of a B event. Let me elaborate.

There are, I have said, two questions: Do ceteris paribus sentences express true propositions? If so, do those true propositions determine anything worth calling *psychological ceteris paribus laws*? If it is stipulated that [4] gives the meaning of ceteris paribus sentences, then the question whether they express true proposi-tions becomes the question whether there are true substitution instances of [4]'s right-hand side. But of course there are, on any charitable reading of [4]: the claim that the right-hand side has true substitution instances is a claim virtually anyone can accept, as it merely combines a mild form of multiple realization with the claim that mental properties are realized by more basic properties—perhaps only properties of fundamental physics—that enter into strict laws. So what else is new?

It may be conceded, then, that ceteris paribus sentences express true proposi-tions if [4] gives their meaning, and the question becomes whether these true propositions determine anything worth calling psychological ceteris paribus laws. It is important to keep the real question firmly in mind. Imagine that you're presented with a true substitution instance of [4]'s right-hand side. Should *that itself* be called a *psychological law*, and if not, what that it determines should bear that honorific? That is the real question, because it is that substitution instance that is supposed to tell us the proposition expressed by the ceteris paribus sen-tence. Now it's obvious that no substitution instance of [4]'s right-hand side is any kind of law: just try using it as a premise in a covering-law explanation. But it's equally hard to see what else such a substitution instance could present that would warrant talk of an M-using psychological law. If there's a *law* that Ms cause Bs ceteris paribus, then an explanation of a B event which uses that law ought to give an explanatory role to M. But what kind of an explanation of the fact that x is B would [4]'s right-hand side afford? The best I can make out—bear-ing in mind that an explanation can have no explanatorily superfluous parts—is:

$$\frac{(\exists D)(\exists C)(Dx \ \& \ Cx \ \& \ Dx\text{-}\&\text{-}Cx \text{ is nomologically sufficient for } Bx)}{Bx}$$

Not only does this explanation imply nothing worth calling a psychological law, it doesn't even give an explanatory role to M. And forget about the absurdity of supposing that this little inference, or anything remotely like it, gives the form of

a folk-psychological explanation. I conclude that the old news that the right-hand side of [4] has true substitution instances gives no role to anything worth calling a law of commonsense psychology.

Is there anything else that might be meant by a ceteris paribus sentence that would warrant talk of ceteris paribus laws? Perhaps we've dealt with the best candidates, but I'll mention three others for the sake of completeness.

It might be suggested that ceteris paribus sentences have *probabilistic* completions, and that, consequently, ceteris paribus laws are revealed to be probabilistic laws. In other words, the true proposition expressed by '*M*s cause *B*s ceteris paribus' is something to the effect that there is such-and-such probability that an *M* event will cause a *B* event, and this true proposition is a probabilistic law.

Actually, one might well mean a probabilistic proposition if one were to utter a sentence like 'If a person wants something, then, all other things being equal, she'll take steps to get it'; one might mean that it's likely that a person will take steps to get a thing if she wants it. The trouble, of course, is that such a true proposition would not be a law, and this because the intended probability would be epistemic: one would mean that it's reasonable for someone in the same epistemic position as oneself to have some nonnegligible degree of expectation that a person will take steps to get a thing if she wants it. If a proposition is to be a probabilistic law, then the probability involved must be objective, but not even every objective probability yields a probabilistic law. For example, the true proposition that the actual frequency of *M* events that cause *B* events is such and such wouldn't be a law, whatever the relative frequency. One might appeal to relative frequencies in physically possible worlds, but then other problems would emerge. For example, there may be physically possible worlds where *M* events don't cause *B* events, but only because of the prevalence in those worlds of ceteris paribus defeaters. There may, however, be causal laws involving objective chance, laws that say that there is such-and-such objective chance that an *F* event will cause a *G* event. But our commonsense psychological '*M* events cause *B* events ceteris paribus' can't be expressing the truth that there's such-and-such objective chance that an *M* event will cause a *B* event, for there can be no such truth: there won't be one objective chance of causing a *B* event that all *M* events share. An *M* event that is also an *F* event will have no objective chance of causing a *B* event, if being *F* precludes an *M* event from causing a *B* event, whereas an *M* event that has all the other properties requisite for causing a *B* event and none of the defeaters will have a much greater objective chance of causing a *B* event.

So much for trying to squeeze probabilistic laws out of ceteris paribus sentences. Another way of seeing ceteris paribus sentences as expressing laws is suggested by David Armstrong (1983). He would bring to bear his theory of "oaken laws", which would tell us that

> There is some indefinable je-ne-sais-quoi relation *N* between properties
> such that if *N*(*F*, *G*), then *F* is *defeasibly* nomologically sufficient for *G*,

and then he would propose that the appropriate reading of '*M*s cause *B*s ceteris paribus' is '*N*(*M*, *B*)'. I have three brief responses to this. First, to accept it is to

buy into Armstrong's general account of laws, and John Carroll (1987) and Bas van Fraassen (1989) have given us reason for not doing that. Second, it isn't at all plausible that the intentional conditions in play are defeasible sufficient conditions. It's not that M is nomologically sufficient for B in the absence of some defeater; the only plausible thought is rather that, while M is never nomologically sufficient for B, it can be supplemented in a way that would yield a nomologically sufficient condition.[5] Third, the notion of a "defeasible sufficient condition" seems nearly as unclear and problematic as the "all other things being equal" it replaces.

Finally, as a last attempt, it may be proposed that (a) the proposition expressed by 'Ms cause Bs all other things being equal' is the proposition *that Ms cause Bs all other things being equal* and that (b) it's not possible to express this proposition in other terms—it's the proposition that Ms cause Bs all other things being equal, and there's an end to it. But I don't think this can be right. It would require treating 'all other things being equal' as a noncomposite idiom that expressed a satisfiable condition (the proponent of ceteris paribus laws needs to speak of the satisfaction of the ceteris paribus condition) that was not expressible by any literal English phrase. Even worse, since each ceteris paribus sentence has its own defeating condition, the proposal would also require that the fused idiom either expressed a *different* ineffable condition in *each* sentence in which it occurred or else expressed a single ineffable *meta*-condition whose satisfaction by ordinary intentional or physical conditions would secure that any relevantly related M event would cause a B event.

In this way, then, I am made to doubt that there are commonsense psychological ceteris paribus laws: I can't find a plausible candidate for a true proposition expressible by a ceteris paribus sentence that would entail the existence of anything worth calling a *psychological* ceteris paribus *law*. I don't claim to have shown that the candidates considered exhaust the positions in logical space, but

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[5] In other words, folk-psychological ceteris paribus laws without the ceteris paribus qualification aren't like the law of universal gravitation on the reading of that law which makes it defeasible (see Cartwright 1983). Apropos of this, Georges Rey has suggested (in conversation) that

> Ms cause Bs ceteris paribus just in case if an M doesn't cause a B, then something *prevents* it from doing so.

But the point about intentional conditions not being defeasible sufficient conditions shows that this fails to provide a necessary condition. For it may be that, while Ms cause Bs ceteris paribus, a given M event doesn't cause a B event because certain further *positive* conditions aren't satisfied and not because it's *prevented* from causing a B event. Another reason this fails to provide a necessary condition was revealed in the discussion of multiple realization (see p. 6): certain realizations of M may themselves be among the defeating conditions alluded to in the ceteris paribus clause, and, of course, the reason that such a realization wouldn't cause a B event wouldn't be that it was *prevented* from doing so. A third problem with Rey's suggestion (when offered in defense of ceteris paribus laws) is that we can't say whether it warrants talk of it's being a *law* that Ms cause Bs ceteris paribus until we see whether its analysans provides an explanatory role for the intentional property M, and we can't know this until we're told how the notion of *prevention* is to be understood. Multiple-realization problems of the sort [3] foundered on (see p. 6) may prove sticky in this regard.

I hope I've considered the most promising candidate for the nature of common-sense psychological ceteris paribus laws.

III

If there are no folk-psychological ceteris paribus laws, then what are we to make of commonsense psychology's ceteris paribus sentences and how are we to account for the explanatory role of psychological properties?

As regards the first question, I doubt, in the first place, that there is any interesting sense in which ceteris paribus sentences belong to folk psychology. I suspect that we professional philosophers are just about the only "folk" who use words like 'ceteris paribus' or even 'all other things being equal'. Nevertheless, I won't press this, because we at least do seem able to understand ceteris paribus sentences; so we may wonder what we understand by them. But this, I think, is easy to answer. When we say that Ms cause Bs ceteris paribus we mean, roughly speaking, that we can sometimes explain the occurrence of a B event by saying it was caused by an M event but that the mere occurrence of an M event won't itself suffice for the occurrence of a B event. Now the proponent of ceteris paribus laws needn't disagree with this; she may even say that it joins precisely the core issue—to wit, whether we need laws involving psychological properties to account for their explanatory role.

I agree that this is the important question, for what could be the *interest* of the issue of ceteris paribus laws if those who believed in them didn't think they were needed for psychological explanations and thus needed to account for the role that psychological properties play in them? But I don't think psychological properties must occur in any kind of law in order to have their explanatory role accounted for.

To ask whether laws are needed to account for the explanatory role of psychological properties is just to ask whether laws are needed to account for the role of psychological notions in true 'because'-statements. For the explanatory role, the "causal relevance", of psychological properties is nothing over and above their ability to occur in true 'because'-statements. Odile went to Lyons, we explain, because she wanted to be with her lover and believed he was there, and in this typical use of propositional-attitude properties lies their explanatory role, their "causal relevance". Do we, then, need laws to account for it? Better yet, why would anyone think that laws were needed? I can think of two possible answers, and neither is very good.

1. If we restrict ourselves to causal explanation, there seem to be at least two necessary conditions for the truth of instances of the form 'x Fed because x Ged'. The first is that x's Ging caused x's Fing; but we should know from Davidson that this per se implies nothing about the causal relevance of G. The second condition, however, is that, subject to a certain qualification, x's Ging would not have caused x's Fing if it hadn't been a Ging, i.e. if it hadn't had the property of being

a *G* event, and it is to account for this counterfactual power of mental properties that laws involving them might be thought to be needed. The qualification alluded to pertains to a rarely exemplified kind of overdetermination, and I shall ignore it.

Commonplace examples show that laws aren't needed to account for a notion's occurrence in a true 'because'-statement: Charles fell because he stepped on a banana peel; but we would be ill advised to seek a covering law containing the notion *banana peel*. And we've already seen how supervenience can be used to explain the counterfactual role of a property without implicating any law involving it. The occurrence of an *M* event might supervene on a certain physicalistic state of affairs which together with a certain other physicalistic state of affairs *D* is causally sufficient for the occurrence of a *B* event, but this doesn't mean that *M-&-D* is causally sufficient for the occurrence of a *B* event.

2. I suspect the real impetus underlying the quest for laws is the covering-law model of explanation, or what a theorist might take to be the kernel of truth contained in it. The theorist will appeal to the full structure of the complete explanation implied by a propositional-attitude 'because'-statement and will focus on what one knows in knowing the propositional-attitude *theory* brought to bear in the complete explanation. For consider again the example of Odile. Someone asks why she went to Lyons, and the reply is that she went there because she wanted to be with her lover. But no one supposes that the full explanans thus proffered is exhausted by the single proposition that Odile wanted to be with her lover. A more reasonable proposal is that the full, albeit implicit, explanans has at least two parts. One part will contain the proposition that Odile wanted to be with her lover, along with other propositions explicitly about her that were either already mutually known by the speaker and hearer or inferred in the context. But another part will be general knowledge one brings to any propositional-attitude explanation, knowledge that isn't about any particular person or any particular attitude contents but that enables one to take the propositions of the first sort, those explicitly about Odile, as helping to explain what she did.

General knowledge requires a general proposition, and that, it is reasonable to suppose, will be some proposition that shows how beliefs and desires can be among the determinants of action. At the same time, we know this general proposition can't be a strict law; whence the default conclusion that it's a ceteris paribus law, perhaps something like

> If *x* desires *p* & believes that (*p* if *x* does *A*) & *x* has correct beliefs about how to do *A* & *x* is able to do *A* & *x* has no stronger competing desire, then, ceteris paribus, *x* does *A*.

And with all these parts in play, we have a neat little picture of the complete explanation of the explanandum, that Odile went to Lyons: it's the conclusion of a sound deductive argument whose first premise is the general ceteris paribus proposition, whose second is a conjunction of particular-fact propositions about Odile and what she wants and believes, and whose third premise is the proposition that *cetera* are *paria*.

This is a pretty picture, and the fact that we've seen that it can't work doesn't mitigate the challenge it provides: for it would *appear* that we bring the same general knowledge to each propositional-attitude explanation, that the content of this knowledge is precisely what we mean by commonsense propositional-attitude psychology, and that the general knowledge can't consist of strict laws. So the challenge is to show that these appearances are either illusory or else don't really require ceteris paribus or any other kind of psychological laws.

Essentially, they are illusory. Folk psychology isn't a proposition that functions as a premise in psychological explanations; it isn't a proposition at all, and so not even a theory, if by that we understand something expressible in a true sentence; and, of course, commonsense psychological explanations aren't deductions of explananda from explanantia, and the only explanans in a propositional-attitude explanation is a conjunction of particular propositions about the agent in question. A better picture is something roughly along the following lines.

We acquire folk psychology in acquiring commonsense psychological concepts, and, as we ought to know from observing young children, what we acquire isn't knowledge of what, if it existed, would have to be extremely complex general propositions. What we acquire is a new subjective conditional probability function involving the acquired propositional-attitude concepts.[6] This function has several aspects. One aspect is of primary use in forming beliefs about the beliefs and desires of others. Thus, the subjective conditional probability function of a person who has standard mastery of our propositional-attitude concepts will be such that his subjective probability that a person believes that there's a dog in front of her given that there is a dog in front of her is greater than his subjective probability that a person believes there's a dog in front of her given that there is no dog in front of her and less than his subjective probability that a person believes there's a dog in front of her given that there is a dog in front of her and she isn't blind.

Another aspect is of primary use in forming predictions and explanations of what others will do. Thus, the subjective conditional probability function of a person who has standard mastery of our propositional-attitude concepts will be such that his subjective probability that a person will Φ given that she wants to Φ is greater than his subjective probability that a person will Φ given that she doesn't want to Φ and less than his subjective probability that a person will Φ given that she wants to Φ and has true beliefs about how to Φ. Explanation comes into the picture because of this helpful feature of our subjective conditional probability function: to a first approximation, the subjective probability that a person will Φ *because she has such-and-such attitudes* given that she has those attitudes is *only slightly less* than the subjective probability that a person will Φ given that she has those attitudes. In other words, the conceptual roles of our propositional-attitude

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[6]At least that's what it would appropriately be called if our degrees of belief satisfied the axioms of probability theory—a fine point I won't pursue. I should confess that I regard the appeal in this context to a "subjective probability function" as a heuristically useful first approximation to an account that can be presented without that notion but uses in its place the more general notion of functional role. But see Field (1977).

concepts secure that typically when we move directly from a belief that a person has such-and-such attitudes to a belief that he will do a certain act we *also* move to the belief that the person will do the act *because* he has those attitudes. In this way, we see how one can gain propositional-attitude explanations of behavior without any relevant general beliefs.

So I submit that the "folk theory" we bring to each commonsense propositional-attitude explanation isn't some general proposition that serves as a premise in those explanations. What we bring to each explanation, and wherein our possession of folk psychology consists, is possession of our propositional-attitude concepts, a complex ability to form propositional-attitude explanations, which explanations neither contain nor presuppose nor need propositional-attitude laws.

This last point, that commonsense propositional-attitude explanations don't require propositional-attitude laws, is one we may be justified in making, but it would be better if we could sustain it with an account of such explanations. Explanation, however, is a difficult and complex subject, and I have no fully worked out account. Still, I hope I might say something about the structure and nature of commonsense propositional-attitude explanations that at least points in the right direction.

Odile went to Lyons because she wanted to be with her lover and believed he was there. This is a paradigm commonsense propositional-attitude explanation, and we have good reason to deny that its truth requires there to be a law subsuming the propositional-attitude properties it involves, for there are no strict such laws, and we have reason to deny that there are any "unstrict" such laws. What, then, makes this 'because'-statement, this explanation, true? Partly, I have already implied, 'that Odile's belief and desire figure among the causes of her going to Lyons and that she wouldn't have gone to Lyons if she hadn't both wanted to be with her lover and believed he was there. Yet this isn't sufficient for the truth of the 'because'-statement, for, as I have also intimated, it is *not* the case that

> x *F*ed because x *G*ed *if* $(\exists e)(\exists e')(e$ caused e' & e is a *G*ing by x & e' is an *F*ing by x & e wouldn't have caused e' if e hadn't been a *G*ing by x).

For it may be that e caused e', that e was something that Hugo did in the presence of Regina, that e' was Hugo's becoming embarrassed, and that e wouldn't have caused e' if e hadn't been something that Hugo did in the presence of Regina. But we shouldn't on that account want to say that Hugo became embarrassed *because* he did something in the presence of Regina—not when, as it happens, he became embarrassed because he burped in her presence.

What more, then, is needed for explanation, for, that is, a true 'because'-statement? So far we have—as regards causal explanation and ignoring a certain qualification (the one about overdetermination)—

> x *F*ed because x *G*ed *only if* (1) x's *G*ing caused x's *F*ing, and (2) x's *G*ing wouldn't have caused x's *F*ing if it hadn't been a *G*ing.

But we have seen that this doesn't provide a sufficient condition. I would like to suggest that while these two conditions aren't sufficient, they do, in a sense to be

made clear, provide the essence of causal explanation, that we can't add to them a further condition to make a neat little context-independent sufficient condition, and that whether a substitution instance of these conditions yields an explanation depends on pragmatic concerns centering on the nature of the concepts instantiating 'F' and, especially, 'G'. In other words, whether a property that occupies the 'G' slot in an instantiation of the right-hand side of the displayed conditional can earn a place in an awaiting true instance of the left-hand side isn't a matter of the property's occurring in a law; *it's a matter of its satisfying certain pragmatic concerns.*

Commonsense explanations are 'because'-statements, and they are answers to explicit or implicit 'why'-questions. When we ask why *x F*ed, we typically have in mind some *kind* of property such that we believe that a cause of *x*'s *F*ing instantiates a property of that kind, that the cause wouldn't have been a cause if it hadn't had that property, and what we want to know is *which* property of that kind is thus operative. Someone who wants to know why Odile went to Lyons would not be very happy with an answer given in terms of physical forces acting on Odile's body and neurophysiological states of her nervous system; he wants his answer propositional-attitude style. Naturally, this raises the question of what determines the kinds of properties in which one is interested in the explanatory context, and this is the important question. I won't hazard a complete answer, but I shall hazard this much. Suppose there were kinds of properties K and K' such that (a) events having a property of kind K' are typically caused by events having a property of kind K, (b) the latter events wouldn't have caused the former events without their kind K properties, (c) there is a reliable practice of predicting events having properties of kind K' on the basis of events having properties of kind K, and (d) properties of kind K are relatively manipulable and epistemically accessible. Then, I suggest, properties of kind K will have satisfied the pragmatic and other concerns necessary to earn them a place in true 'because'-statements that explain the occurrence of events having properties of kind K'.

Now propositional-attitude properties satisfy the relevant pragmatic interests, and we already knew that they satisfied the causal and counterfactual prerequisites of explanation. First, actions are typically caused by propositional attitudes, and those causes wouldn't have been causes had they not had their propositional-attitude properties; satisfaction, then, of the causal-counterfactual core of explanation by propositional-attitude properties is ubiquitous. Second, propositional-attitude properties enter into a reliable predictive practice; we are often in a position reliably to predict someone's behavior on the basis of propositional attitudes we ascribe to him. This is just to add a further gloss to the story about subjective conditional probability functions. Acquisition of our propositional-attitude concepts carries with it a disposition to move to a high subjective probability that *x* will Φ when we believe that *x* has such-and-such propositional attitudes and our subjective conditional probability function is such that, for any proposition *p* that we believe, our subjective probability that *x* will Φ given (*p* and that *x* has those propositional attitudes) is high. The further gloss is simply that this belief mech-

anism is reliable: beliefs formed in this way about what people will do tend very often to be true. Third, propositional-attitude properties are relatively manipulable and epistemically accessible: we are frequently able to affect the beliefs and desires of others, and we are often in a position to have knowledge of them.

Let me pull things together. The causal-explanatory role of propositional-attitude properties is their ability to occur in true 'because'-statements, such as our on-going paradigm, the statement that Odile went to Lyons because she wanted to be with her lover and believed he was there. What makes such a 'because'-statement true is not that the propositional-attitude ascriptions it entails occur as *premises in a deductive argument whose conclusion is the fact being explained* and one of whose other premises is a commonsense propositional-attitude ceteris paribus law knowledge of which is partly constitutive of our knowing folk psychology. In the first place, knowledge of folk psychology isn't propositional knowledge, and so a fortiori isn't knowledge of any general propositions; it's possession of folk-psychological concepts with complex functional roles, functional roles that make possible, in something like the way sketched, the ascription of propositional attitudes, and, on the basis of those ascriptions, the prediction and explanation of actions. In the second place, folk-psychological explanations aren't made true because the propositional-attitude ascriptions they entail occur along with ceteris paribus laws in sound deductive arguments. They are made true by the fact that they give causes of the actions being explained under descriptions that are counterfactually relevant in the way specified above and that *interest us in certain ways*. We want to know the causes of behavior under propositional-attitude descriptions because of the pragmatic importance those descriptions systematically have for us owing to the fact that behavior is typically caused by propositional attitudes, that propositional attitudes are manipulable and epistemically accessible, and that our propositional-attitude concepts afford us a systematic and reliable basis for the prediction of behavior.

IV

"But wait", I can hear somebody say, "if folk psychology is no kind of explanatory theory that we can write down, then doesn't that mean that there can be no such science as cognitive psychology, which, after all, is supposed to be, at least in part, a refinement of the folk theory? And what, to take the thought a step further, are we to make of the special sciences without laws? For if the special sciences can't have ceteris paribus laws, then they can't have laws."

Glad you asked. Fortunately, there's barely space for a short answer, so I'll close with these inadequate comments.

1. I'm extremely skeptical of there being *true* ceteris paribus *laws* anywhere (which isn't to deny that there are useful falsehoods like Boyle's law). If it were claimed that some special-science ceteris paribus sentence expressed a ceteris paribus law, then the challenge would be the same as before: to specify the true

proposition expressed by the sentence that would prove the existence of the law. But the theoretical constructs of any nonbasic science are constructs that are realized (whatever exactly that means) by the constructs of some more basic science, and this suggests that the best bet for the law-entailing true proposition expressed by the special-science ceteris paribus sentence will be some version of one of the rejected candidates for folk psychology's best bet. However, I must admit to finding the issue harder to discuss when we move outside of folk psychology. For there at least we have clear examples of relevant ceteris paribus sentences. But where are the clear examples when we move to the special *sciences*? Where are the clear examples in, say, biology? This sets up my next point.

2. When *I* read biology, I have a hard time finding anything that looks like a law-invoking explanation, and I think I know why.[7] Suppose you just invented the spring-activated mousetrap and had to explain *how it worked*. You would explain that, when the device works, it's because a mouse nibbles at cheese placed on a release mechanism; the movement caused by the nibbling releases a bar attached to a stretched spring; etc. But you wouldn't mention any laws. Maybe if you went on in an explanatory chain long enough, you'd get to laws; but they'd be laws of physics, not laws of mousetrap theory. In the same way, much of biology is concerned to explain how various mechanisms work—think of the explanation of photosynthesis—and such explanations seem not to invoke any biological *laws*, strict or ceteris paribus.

3. Cognitive psychology, too, insofar as it's legitimate, is largely concerned with explaining how things work: how we remember, solve problems, process sentences, and so on. In explaining the mechanisms by which we do these things, it can take its cue from commonsense psychological explanations. But since it's explaining how mechanisms work, there's no obvious reason such explanations should *need* laws, strict or ceteris paribus.

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[7] A hard time, not an impossible time. There are things that may *look* as though they're law-invoking explanations, such as explanations that mention the "Hardy-Weinberg law" of population genetics. But whether such explanations really invoke "laws" (as opposed, say, to definitions), and whether those "laws" really contain implicit ceteris paribus qualifications, may be matters of proper debate. In any case, I stand by the main point being made in the text, which is that special-science explanations are frequently, if not typically, explanations of how mechanisms work, and such explanations seem not to be law invoking.

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