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## **Relational Properties, Causal Powers and Psychological Laws**

This paper argues that Twin Earth twins belong to the same psychological natural kind, but that the reason for this is not the thesis that the causal powers of mental states supervene on local neural structure. Fodor's argument for the thesis is criticised and found to rest on a confusion between it and the claim that Putnamian and Burgean type relational psychological properties do not affect the causal powers of the mental states that have them. While it is true that Putnamian and Burgean type relational psychological properties do not affect causal powers, it is false that no relational psychological properties do. Examples of relational psychological properties that do affect causal powers are given and psychological laws are sketched that subsume twins in virtue of them instantiating these relational properties rather than them sharing the narrow contents of their thoughts.

*Keywords:* relational properties, causal powers, psychological laws, narrow content, Fodor, Burge

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### **I**

The driving force behind Dennett's (1982) 'notional worlds' characterisation of mental content, Fodor's (1980) 'fully opaque' taxonomy of mental content, Fodor's (1987) 'narrow content', and numerous other similar notions is the attempt, as Dennett puts it, to 'capture the organismic contribution to belief in isolation' (ibid., p. 209) from the actual environment of the organism. Why would anyone want to capture this 'organismic contribution'?

The most influential answer to this question is that Putnam's (1975) and Burge's (1979) famous thought experiments cause serious problems for any *relational* psychology, that is, for any psychology that operates with more

than the 'organismic contribution' to thought.<sup>1</sup> Why is this? Well, a scientific intentional psychology operates with laws that describe how mental states and events—thoughts, for short—cause bodily behaviour. These laws describe the ways that various kinds of thought causally interact with various kinds of behaviour. So these laws, like the laws of any empirical explanatory scheme that aspires to be a (special) science, must embed predicates that pick out natural kinds, that is, the causal-nomologically relevant properties in virtue of which thoughts cause behaviour. But bodily behaviour is a species of physical event. So, if thoughts indeed cause behaviour that must be because they supervene on the physical properties of individuals, in particular, their neurophysiological properties. Moreover, we know from neurophysiology that the physical events in our brains and nervous systems that are the proximate causes of our bodily motions are so because of their internal or intrinsic or anyway non-relational properties; non-relational in the sense that they do not involve any relations to things outside the skin of the subject (though they may involve relations to other things within the skin of the subject). This means that two thoughts have different causal powers only in so far as they are each instantiated or realised by neural states that differ in their non-relational properties. In other words, the features of thoughts that are causally efficacious in the production of behaviour locally supervene on the subject's body.<sup>2</sup> But what Putnam's thought experiment shows is that our commonsense scheme for individuating thoughts—namely, by their truth conditions—does not respect this last supervenience requirement. Ralph and Twin Ralph are physical duplicates—all the natural<sup>3</sup> non-relational properties of their neural states are identical—yet the truth conditions of the their thoughts differ: Ralph thinks *water* is wet while his twin thinks, as we might put it, that *twater* is wet. Therefore, in so far as commonsense psychology individuates thoughts by reference to their truth conditions, it does not individuate thoughts by reference to their causal-nomological properties and so does not individuate thoughts in a way

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<sup>1</sup> Of course, neither Putnam nor Burge endorse the individualistic or methodologically solipsistic ends to which their arguments have been put.

<sup>2</sup> To be more precise, the apposite notion of supervenience here is what Davies (1992) calls *modally strong local supervenience*: If x has intentional property F in possible world w1, and y is a duplicate in w2 of x (in w1), then y has F in w2. This is the notion of supervenience I shall employ henceforth.

<sup>3</sup> This qualification is needed to rule out 'impure intrinsics'. See Davies (1998) for discussion.

appropriate to psychological laws.<sup>4</sup> Following one traditional strand in the literature, let us call the kind of thought content that is dependent on physical things and stuffs in the thinker's environment, that is, the kind of thought content that has physically determined truth conditions, *propositional content* (so long as we keep in mind that this is the 'Russellian' notion of a proposition, employed for example by Kaplan (1989), the constituents of which are objects and properties in the world, and not the Fregean one according to which propositions are thoughts composed entirely of senses.)

As is well-known, Burge's thought experiments extend the range of Putnam's external determinants of thought content beyond the physical environment of the thinker and into his social context. The striking moral of Burge's thought experiments is that, according to commonsense psychology, the contents of a thinker's thoughts are in part determined by social factors in his language community of which he may be ignorant, namely, how his compatriots use words. Alfred is under the misapprehension that arthritis is a disease that can occur in the thigh as well as the joints. Alfred's medical doctor knows better: arthritis is exclusively a disease of the joints and cannot, by definition, occur in the thigh. Alfred says to his doctor, 'The arthritis in my ankles has spread to my thigh'. Can we truly say of Alfred that he believes that he has arthritis in his thigh? The answer appears to be 'Yes'. He believes something that is, as we might say, necessarily or analytically false—that he has arthritis in his thigh—and so he is pretty confused; but he believes it nonetheless. Imagine now a counterfactual situation in which all non-intentional facts about Alfred's physical, behavioural, phenomenalist, and functional history are held constant while his social context is altered in the following way: in his language community the word 'arthritis' refers to rheumatoid ailments that can occur in both joints and the thigh. Can *we* truly say of counterfactual Alfred, as we can of our actual Alfred, that he believes he has arthritis in his thigh? Burge invites us to answer 'No' and it is hard to refuse the invitation. After all, *our* word 'arthritis' applies only to inflammations of the joints and Alfred's counterfactual compatriots do not apply *their* word 'arthritis' only to inflammations of the joints; that is to say, their word 'arthritis' does not mean what our word 'arthritis' means—it does not mean *arthritis*. To make the point vivid, consider that, unlike Alfred, when counterfactual Alfred says

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<sup>4</sup> See chapter two of Fodor 1987 and Fodor 1991 for versions of this argument. Cf. Crane 1991 and Dennett 1982. See Stalnaker 1989 for criticisms of both Fodor's idea of narrow content and Dennett's notional attitude psychology.

'The arthritis in my ankles has spread to my thigh' he expresses a *true* belief. Since Alfred's belief is false and counterfactual Alfred's is true, they must be different beliefs. Burge's conclusion is that by varying only the use of words in a subject's community we can alter the very content of the subject's thoughts. Again, we have a clear breach of local supervenience that bodes ill for the prospects of incorporating commonsense ways of individuating thoughts into psychological laws. The radical conclusion of Burge's thought experiment comes home when we consider that, unlike the case with Putnam's thought experiments, there are no physical things or stuffs in the two Alfreds' environments that accounts for the difference in the truth conditions of their thoughts—there is no extra disease, for example, in counterfactual Alfred's community. The truth conditions are, rather, determined socially by the way the members of the community use their words. Let us follow Loar (1988) and call this radical new kind of content *social content*.

From these thought experiments, Putnam and Burge draw the conclusion that various philosophical theories of mind that are 'individualist' in outlook, that is, that hold that thought content is individuated non-relationally, in the sense of locally supervening on the subject's body, are mistaken. Of course, the advocate of the Fodorian argument from causal powers adumbrated above infers the opposite conclusion: so much the worse for the commonsense taxonomy *as interpreted by Putnam and Burge*. Since commonsense as interpreted by Putnam and Burge does not taxonomise by causal powers—and so taxonomises twins differently—we need some kind of taxonomy that does—that is, one that does taxonomise twins together—if we are ever to have a scientific psychology.<sup>5</sup>

Evidently, an essential lemma along the way to Putnam's and Burge's conclusion that various traditional theories of mind that operate with a locally supervenient, non-relational taxonomy of thoughts are mistaken, is that propositional content and social content are the kind of content individuated by commonsense psychology in its efforts to explain behaviour. Let us bring in another useful term from Loar and call 'whatever individuates beliefs and other propositional attitudes in commonsense psychological explanation, so that they explanatorily interact with each other and with other factors such as perception in familiar ways' (p. 568) *psychological content*. We can then say

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<sup>5</sup> The interpretation of the first Fodorian argument from causal powers is more complicated than I have indicated and will be taken up in detail in the next section. For valuable discussion of Fodor's argument, especially the dialectical situation, see Davies 1986.

that Putnam and Burge assume that propositional content and social content are psychological content. Loar goes on to argue that this assumption is mistaken. Due consideration of Loar's argument that neither social content nor propositional content is psychological content would take us too far afield. My aim is instead to emphasise the fact there are good commonsense reasons for saying that Ralph and Twin Ralph are importantly *psychologically alike* despite having different beliefs; similarly for the Alfreds (cf. Lewis, 1981). Indeed, it was part of Putnam's (1975) own original description of Twin Ralph that 'It is absurd to think that *his* psychological state is one bit different' (p. 227) from Ralph's.<sup>6</sup> We can grant that when the Ralphs both utter the sentence 'Water is H<sub>2</sub>O' and thereby express their beliefs, Ralph's belief is true and Twin Ralph's is false; and again, that when the Alfreds utter the sentence 'My arthritis has spread to my thigh' one of them has a true belief and the other a false one. If the only information we are given is that X has a true belief and Y a false one, and we are then asked whether X and Y have the same belief, it is extremely plausible to think that the proper answer is 'No' (Cf. Stich, 1978). But once the *recherché* situations are described to us in detail and we are asked whether the Ralphs (or the Alfreds) are therefore psychologically different, it is very plausible to return a negative answer—at least we feel more hesitation in returning a Yes answer than we did a No answer to the first question.

We must be very careful, however, in saying exactly why commonsense might wish to say that the Ralphs were psychologically alike despite having different beliefs. In particular, as Tomkow (1992) has emphasized in work that has lamentably remained unpublished and which I shall draw upon in what follows, let us not confuse commonsense with philosophical theory on this score. We have already discussed philosophical reasons for thinking that the Ralphs are psychologically alike despite their not sharing beliefs. As we have seen, Fodor's metaphysical ruminations on causal powers adumbrated above lead him to the conclusion that 'Causal powers supervene on local microstructure. In the psychological case, they supervene on local neural struc-

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<sup>6</sup> Of course, Putnam's original thought experiments concerned linguistic *meaning* and not intentional states such as belief. So when Putnam says that the Ralphs' *psychological states* are not one bit different it is not clear whether he thinks that their *beliefs* are not one bit different either. I will assume with most philosophers that Putnam's arguments do extend to intentional states in so far as these are individuated by their truth conditions, and hence, that Putnam's conclusions are on a par with Burge's in this respect. On this, see Burge 1982.

ture' (1987, p. 44), and hence, since the twins are physical duplicates, they should be classed together for the purposes of psychological explanation. So, there is certainly room in philosophical theorising about the mind-body relation for the view that the Ralphps are psychologically the same.

That the causally efficacious aspects of thoughts must supervene on the non-relational neural properties of the subjects of those thoughts, and ultimately upon their intrinsic physical properties, is not, however, the reason why commonsense groups the Ralphps together. The reason why commonsense groups the Ralphps together has nothing especial to do with philosophical theories about what supervenes on what; it has to do with the fact that they behave in relevantly similar fashions upon being confronted by qualitatively indistinguishable liquids (Tomkow 1992). Commonsense knows full well that people's reactions to and actions upon the objects and stuffs in their environment depend on the observable properties of those things and not their hidden micro-structures. The success of many practical jokes depends on this commonsense knowledge. We can easily trick Ralph into drinking XYZ and Twin Ralph into drinking H<sub>2</sub>O (though it would not be a particularly funny joke). If we were to swap their respective glasses of H<sub>2</sub>O and XYZ for each other without their noticing then they would drink them all the same. None of this depends upon the Ralphps being physical duplicates. We could just as easily do this with two subjects who were not duplicates. What does the work in leading us, as commonsense psychologists, to the conclusion that the Ralphps are psychologically similar despite having different beliefs is the fact that when they are presented with identical scenarios they do the same thing. Let us suppose that you and I both wish to slake our thirst and that you are presented with H<sub>2</sub>O while I am presented with XYZ (and that our perceptual and rational faculties are in normal working order). We can, I think, make a couple of (boring) commonsense psychological predictions here: first, that both you and I will come to believe that we are confronted with something called 'water' and, second, that both you and I will drink our respective liquids. If this is correct, then we are, for all intents and purposes, psychologically the same – in the sense that we are subsumable under the same psychological laws, such as the following very rough ones:

(PL1)  $\forall x \forall y (x \text{ has a waterish appearance} \ \& \ x \text{ is seen by } y. \rightarrow x \text{ comes to be believed by } y \text{ to be called 'water'}).$ <sup>7</sup>

(PL2)  $\forall x \forall y (x \text{ is believed by } y \text{ to be called 'water' } \ \& \ y \text{ is thirsty } \ \& \ y \text{ wants not to be thirsty. } \rightarrow y \text{ drinks } x).$

In the case of you and me, we—the 'folk'—are quite prepared to say that we are psychologically similar—in the sense that we fall under something like the above generalisations—even though we are not physical duplicates. The same holds for subjects that also happen to be duplicates, such the Ralphs and the Alfreds. Commonsense agrees, then, with Fodor that twins should be taxonomised together for the purposes of psychology—but not for his reasons. It is not the fact that the Ralphs' brains are identical that is doing the work here; what is doing the work is the fact that, when thirsty, the Ralphs will *ceteris paribus* drink any liquid that is qualitatively identical with water regardless of what its chemical microstructure is.

Putnamian and Burgean thought experiments show that duplicates can have different thoughts in so far as these are individuated by their truth conditions; that is, the intentional states of duplicates can differ in their propositional and social content. But this does not show that duplicates whose intentional states differ in their propositional and social content are not to be classed together for the purposes of psychological theory. Fodor's argument from causal powers appears to show that the Ralphs should be grouped together for the purposes of psychological explanation because their brains are identical. Commonsense concludes that the twins should be grouped together because they fall under the same psychological generalisations regardless of the fact that their brains are identical. Thus Fodor and commonsense arrive at the same conclusion, though from very different premises.

The rest of this paper will be taken up with showing how one can defend the conclusion of Fodor's argument from causal powers—namely, that twins belong to the same psychological natural kind—yet reject his reason for drawing the conclusion. The significance of this is that, *pace* pre-1994 Fodor and many of the advocates of various versions of 'narrow content', one need not restrict oneself to the 'organismic contribution' to thought, in order to think that twins belong to the same psychological natural kind.

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<sup>7</sup> 'Has a waterish appearance' is shorthand for something like: 'is a colourless, odourless, tasteless, ... liquid'. Obviously it is an empirical question just exactly what this complex property in fact is.

## II

The conclusion of Fodor's (1987, 1991) argument from causal powers is that twins should be taxonomised together, they belong to the same natural kind, for the purposes of psychological explanation. As I presented the argument above, it hinged essentially on two premises. In Fodor's own words, they are:

- (1) [P]sychological taxonomy is taxonomy *by* causal powers (1987, p. 40)  
and
- (2) Causal powers supervene on local micro-structure. In the psychological case, they supervene on local neural structure (*ibid.*).

Since the twins are physical duplicates, they have the same causal powers; therefore they belong to the same natural kind for the purposes of psychological explanation.

But this argument is faulty. As I have already mentioned, a corollary of this is that there is no need for a notion of narrow content, for as Fodor himself rightly notes, 'If psychology individuates the attitudes relationally, then it is no more in need of a narrow notion of content than commonsense is' (1987, p. 32). The interesting conclusion, however, is that the causally relevant relational individuation of mental states that I shall propose still taxonomises the Ralphs together! Indeed, as we have already seen, commonsense itself groups the Ralphs together for the purposes of psychological explanation for reasons having nothing to do with them being physical duplicates. Much of the literature simply assumes that the *only* way to capture what is psychologically the same about twins is to abstract from their environments and posit some kind of locally supervenient narrow/organismic content that they share. One recent author, for example, claims that 'The laws of human psychology must be species-wide; this demands that the types which occur in the laws be environment-independent: they cannot be specific to a particular subject (or class of subjects), nor specific to a particular context. It follows that we need mental states narrowly individuated for the purposes of human psychology' (Recanati, 1993, p. 205). If the rough-and-ready generalisations that I proposed above, which subsume both Ralph and his twin and which are implicit in commonsense, are at all plausible, then they are *prima facie* counter-examples to this fairly widespread view.

Though one could dispute (1), I take it that the dispute between 'narrow' and 'wide' theorists takes place against a background of agreement on the

truth of a causal view of psychological explanation. The obvious starting point, then, is to ask what entitles Fodor to (2). Ironically, it is Fodor himself who provides the reasons for rejecting (2); he is hoist with his own petard. For Fodor rightly points out that not all the properties that affect the causal powers of their bearers are non-relational properties. As an illustration he offers the example of *being a planet*. This is a relational property the possession of which affects the causal powers of the chunk of rock that is the planet in question. It causes the chunk of rock to move in an ellipse, or to have a Keplerian orbit, for example. A duplicate chunk of rock that is not a planet may not have these causal powers and may therefore behave differently from its twin. Given this rather obvious point, it is surprising to find Fodor summing up the 'metaphysical point' of his argument in favour of treating twins together as the claim that 'Causal powers supervene on local micro-structure' (1987, p. 44). (1) amounts to what Fodor calls *methodological individualism*: 'the doctrine that psychological states are individuated *with respect to their causal powers*' (Ibid., p. 42); and Fodor is quick to point out that '*Individualism does not prohibit the relational individuation of mental states*'; it just says that no property of mental states, relational or otherwise, counts taxonomically unless it affects causal powers' (ibid.). Though Fodor distinguishes between methodological individualism—individuation by causal powers—and *methodological solipsism*—individuation without respect to semantic properties—he does not clearly distinguish between individualism and the thesis of the *local supervenience of causal powers*. In both chapter two of *Psychosemantics* and his later paper 'A Modal Argument for Narrow Content' he constantly runs together individualism and the local supervenience of causal powers.<sup>8</sup>

To be entitled to (2), Fodor needs a general argument to show that the psychological case is somehow special in that *psychological* relational properties cannot affect causal powers; that, for some reason, in the psychological case, causal powers are locally supervenient. This is not, however, his strategy; rather, what he does is show that certain kinds of relational psychological properties do not affect causal powers—because they do not pass two *a priori* conditions on causal powers: the 'cross-context' and 'no conceptual connection' tests—and conclude from this that the causal powers are locally super-

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<sup>8</sup> As is often the case in the philosophy of mind, terminology can be confusing. It is important not to confuse Fodor's 'methodological individualism' with Burge's 'individualism'. For Burge's characterisation of individualism see the third paragraph of his 'Individualism and Psychology' (1986).

venient.<sup>9</sup> This is a *non sequitur*. It does not follow from the fact that some proffered examples of relational psychological properties do not affect causal powers that none do. But it is this latter stronger claim that Fodor needs to sustain (2), the claim that the causal powers of mental states are locally supervenient—and it is this claim that is inconsistent with relational properties playing a role in psychological explanation. Fodor is evidently in some difficulty here. Given that there are clear cases of non-psychological relational properties that do affect the causal powers of the things that have them—being a planet, for example—how is one to show that there are no psychological relational properties that do—without assuming the very thing to be proven, that the causal powers of mental states are locally supervenient?<sup>10</sup> After all, relational psychological properties, like any type of relational property, are sundry. One risks a failure of imagination if one simply argues inductively that since some psychological relational properties do not affect causal powers none do. But this is precisely what Fodor does. He tries to show that the two aforementioned tests for genuine causal powers rule in certain relational properties, such as being a planet, and rule out certain psychological relational properties, such as *'being a mental state of a person who lives in a world where there is XYZ rather than H<sub>2</sub>O in the puddles'* (1987, p. 34). Fodor may very well be right about this particular relational mental property; in fact, I think he is—but it does not follow from this that the causal powers of mental states are locally supervenient. For him to show that, he needs to show that *no* psychological relational property can pass those tests; and this he has not done.

Fodor confuses (2), the claim that psychological causal powers are locally supervenient, with the following claim:

- (3) Putnamian and Burgean type relational psychological properties do not affect causal powers.

All he does is canvass reasons against (3); nevertheless, for reasons I cannot discern, he takes himself to have established (2). In *Psychosemantics*, he de-

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<sup>9</sup> I shall discuss only the first test. The argument that the second test—the 'no conceptual connection' test—is violated by psychological explanations invoking relational properties of mental states is well answered by Peacocke (1993).

<sup>10</sup> Indeed, now that the dust has settled somewhat, it seems a plausible diagnosis of the situation that Fodor and Burge are simply begging the question against each other. If this is right, then the rest of this paper can be seen as providing a way out of the stalemate.

scribes his conclusion thus: 'Given the causal explanation of behaviour as the psychologist's end in view, he has motivation for adopting a taxonomy of mental states that respects supervenience' (1987, p. 53); where all he is entitled to conclude is that the psychologist has motivation for not adopting Putnam's and Burge's taxonomy of mental states, that is, mental states taxonomised by their propositional or social content. Similarly, in 'A Modal Argument for Narrow Content' he says 'So individualism is true *and local supervenience is preserved*. End of story' (1991, p. 220; my emphasis). In fact, however, it is very far from the end of the story; it is more like the end of the first chapter of a story. For, to repeat, all Fodor does is marshal considerations against (3). The ultimate irony is that Fodor does not even need (2) to show that the twins belong to the same natural kind for the purposes of psychological explanation. Commonsense is way ahead of him in its reasons for thinking that the twins belong to the same psychological natural kind.

If this line of thought is correct, then one must guard against committing the converse mistake: attempting to vindicate the causal powers of Putnamian and Burgean type relational properties—propositional and social content—by showing that the taxonomy of causal powers in various special sciences does not respect local supervenience. For it is perfectly consistent to reject the general metaphysical view that causal powers are locally supervenient and hold that not all relational properties thereby affect causal powers. It seems to me that the debate, in particular that between Fodor and Burge, has been conducted at too high a level of generality. After all, Fodor agrees that some relational properties do affect causal powers; he just thinks that Putnamian and Burgean ones do not. Though Burge offers many compelling examples of relational properties that affect causal powers—from biology, geology, and even psychology—as far I can see he nowhere argues explicitly and directly that the propositional and social content of mental states affects causal powers—which, of course, is the very bone of contention triggered by Putnam's and his own thought experiments. So Burge really fails to join issue with Fodor. One needs to examine carefully relational properties on a case-by-case basis in order to determine which ones can plausibly be said to affect the causal powers of things that have them and which ones cannot. This is the strategy I shall pursue.

I agree with Fodor that the Ralphs belong to the same natural kind for the purposes of psychological explanation; moreover, I agree with Fodor that this means that Putnamian and Burgean type relational properties do not affect the

causal powers of mental states. But since I do not agree with his reasons for these claims, I shall not discuss any further Fodor's arguments for them; they have, in any case, been cogently criticised in detail by Davies (1986) and Burge (1986a, 1989, 1995). These critics' criticisms are, however, offered with a view to defending—or, in the case of Davies (1986), with a view to at least not ruling out—Putnamian and Burgean type relational properties as affecting causal powers. Rather than discuss the dialectical situation with respect to these critics and Fodor I shall lay out my own reasons for thinking that Putnamian and Burgean type relational properties do not affect causal powers and that twins belong to the same psychological natural kind and explain how my view avoids the criticisms that are directed at Fodor.

A useful starting point is the so-called 'cross-context' test for causal powers. Fodor offers a number of different formulations of this test (cf. 1987, pp. 35 and 158n9; 1991, n3 and appendix) the basic thrust of which is that two things have the same causal powers if and only if, in the same context, they have the same effects. The test derives its intuitive plausibility from the fact that causal power is a counterfactual notion. As Fodor notes, 'The cross-context test implies that there cannot be a difference in our causal powers unless there are counterfactuals that are true of one of us but not of the other' (1991, appendix). Much criticism has been levelled at the cross-context test (see Davies 1986, Burge 1989, 1995 and Baker 1995). In my opinion, these criticisms do not get to the heart of the problem because although they correctly interpret the letter of it, they misinterpret its spirit. These misinterpretations are encouraged by Fodor himself and stem, first, from the fact that he offers a number of non-equivalent formulations of the test some of which are clearly inadequate, and second, from his confusion between a psychological taxonomy that respects local supervenience and one that eschews propositional and social content. Consider the fact that Fodor thinks that 'being in a vat does not ... affect the narrow content of one's thoughts', that 'being in a vat wouldn't stop a brain from having the very thoughts that you have now'—in short, that brains in vats are 'just special cases of Twins' (1987, p. 52). These remarks strongly suggest that on Fodor's conception of things, Ralph, Twin Ralph, and an envatted twin brain are all three instances of the same psychological natural kind—for twins are supposed to have the same causal powers. This means that the only causal powers of Ralph that are taxonomically relevant to psychology are those that he shares with his twin-brain in a vat. In other words, the only causal powers that are taxonomically relevant to

psychology are those that locally supervene on brains, that is, those context-independent causal powers of brains that they carry with them wherever they go—the causal powers they have, as Fodor puts it elsewhere, '*come what may*' (1991, p. 208). This is, after all, the local supervenience thesis taken to its logical conclusion. Ralph's brain has the same causal powers as a brain in a vat because if the brain in a vat were to be in Ralph's body in its Earthly environment then it would have the same effects that Ralph's brain has, for example, getting H<sub>2</sub>O into Ralph; and if Ralph's brain were in the vat then it would have the same effects that the vat-brain has. But what effects does a brain in a vat have? None of interest to psychology I should think. Since the brain in a vat does not engage in any behaviour by any standards of what counts as behaviour relevant to psychology, it would be a dramatic denudation verging on the perverse to demand that a psychological taxonomy restrict itself to the locally supervenient causal powers of brains in its efforts to formulate psychological laws.<sup>11</sup>

The foregoing is, I think, the picture that Burge (1989, 1995) has of Fodor's project. He imagines two intrinsically indistinguishable organs one of which is a heart and the other of which pumps digestive waste. Intuitively they are instances of different biological kinds because they have different causal powers: one pumps blood and the other pumps waste. But, on Fodor's cross-context test for causal powers the two organs come out as having the same causal powers—switch them and they produce the same effects—and hence must belong to the same natural kind for biological purposes. Burge quite rightly points out that this way of looking at things 'ignores the fact that specific relations between an entity and its normal environment may be of interest to a special science, and fundamental to its causal taxonomy. ... Fodor's treatment of any environment as being on a par with other "contexts" for testing causal powers is in effect an assimilation of the special sciences to physics' (1995, p. 227-8).<sup>12</sup>

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<sup>11</sup> The problem cannot be not solved by extending the supervenience basis to include everything from the skin of the subject in. In that case, we merely replace a brain in a vat with a person in a vat whose marionette movements are no more the proper subject of psychology than a brain in a vat is.

<sup>12</sup> The point was made independently by Davies 1986, 1991. See §6.1 of the latter paper for an example in which intrinsically similar components of two information processing systems—the '*visex*' and '*audex*', respectively—are switched. The discussion is conducted against the background of the particular debate over whether Marr's theory of vision is '*individualistic*' (in Burge's sense).

I do not think that Fodor takes himself to be committed to this absurd view of psychology—which is so far removed from his beloved intentional psychology as to be virtually unrecognisable—despite the fact that it is entailed by the local supervenience thesis which he misguidedly champions. Indeed, surely the author of 'Special Sciences' (1974) has good reason to reject an 'assimilation of the special sciences to physics'. The important point is that he need not be committed to any such view of psychology since there are good reasons to taxonomise twins together that do not rely on the local supervenience thesis or the recent interpretation of the cross-context test. As I shall try to show, one can accept the admonitions of Burge and Davies regarding the essentially contextual nature of the special sciences, psychology in particular, and still side with Fodor in holding that Burgean and Putnamian twins that differ in the propositional and social content of their thoughts belong to the same psychological natural kind.

### III

In order show this, let us stick with Fodor's astrophysical analogy and consider two different types of astrophysical situations and compare them with two parallel types of psychological situations. In doing so, the real reason why duplicates belong to the same psychological natural kind will emerge; moreover, the claim that duplicates belong to the same psychological natural kind does not infringe any of the important things that Davies and Burge say about the contextual nature of the special sciences. Consider, then, the following four examples—two of them astrophysical and two of them psychological—each consisting of the instantiation of a pair of properties:

- (1) In our first example, we have the planet Terra orbiting the star Sol. We also have a counterfactual situation in which Terra orbits the twin star Twin Sol. In the actual situation, Terra has the property of *being a planet of Sol*. In the counterfactual situation Terra has the property of *being a planet of Twin Sol*.
- (2) Here, in the actual world, we have Roxanne, who is a devotee of Elvis Presley, asking Elvis for his autograph. Counterfactually, Roxanne might have been asking Twin Elvis for his autograph. Actually, Roxanne has the property of being perceptually related to Elvis, or being re-

lated to Elvis, for short. Counterfactually, she has the property of being related to Twin Elvis.

- (3) In this example, we again have the planet Terra orbiting a star in the actual situation. In virtue of this fact Terra has the property of *being a planet*. Counterfactually we imagine that Terra is not orbiting a star (perhaps it is an asteroid floating freely in space after escaping the gravity of another larger body). Counterfactually speaking, Terra does not have the property of being a planet or, what amounts to the same thing, has the property of *not being a planet*.
- (4) With this last situation, we are back with Roxanne who is actually perceptually related to a guy who looks exactly like Elvis and so has the property of being related to someone with an Elvis appearance. Counterfactually, Roxanne has the property of not being related to someone with an Elvis appearance.

To recapitulate, we have four pairs of properties: (1a) *being a planet of Sol*, (1b) *being a planet of Twin Sol*; (2a) *being related to Elvis*, (2b) *being related to Twin Elvis*; (3a) *being a planet*, (3b) *not being a planet*; (4a) *being related to someone with an Elvis appearance*, (4b) *not being related to someone with an Elvis appearance*. The question before us is: Which of these properties affect the causal powers of the things that have them?

- (1) The relevant effects here are moving in an ellipse or having a Keplerian orbit. The difference between *being a planet of Sol* and *being a planet of Twin Sol* does not affect the causal powers of Terra in virtue of which Terra moves in an ellipse. If we swapped Twin Sol for Sol, Terra would still move in an ellipse. Terra cannot, as it were, tell the difference between Sol and Twin Sol. So the difference between the relational properties *being a planet of Sol* and *being a planet of Twin Sol* does not affect the causal powers of Terra. To this it may be objected that the relevant effects are not the same in the actual and counterfactual cases. In the actual case, the relevant effect is orbiting Sol; in the counterfactual case, it is orbiting Twin Sol. The difference between the relational properties does affect the causal powers of Terra because 1a causes the former effect and 1b causes the latter effect. My reply is that the debate concerns those causal powers that are, as Fodor puts it, taxonomic for astronomy. Taxonomic properties are natural kinds: they are the types of properties that can be expected to turn up in the laws of astronomy. The objection confuses the question of what is the adequate explanation of Terra's orbiting Sol

with the question of what kind of properties the astronomic law invoked in the explanation will appeal to. To claim that the relational properties 1a and 1b affect the causal powers of the planets that have them is to claim that there are astronomic laws like the following:

(L)  $\forall x \forall y (x \text{ is a planet of } y \ \& \ y = \text{Sol} \rightarrow x \text{ moves in an ellipse around } y)$ ;

or laws that sustain counterfactuals like: 'If  $y$  were not identical to Sol, then  $x$  would not have moved in an ellipse around  $y$ '. But this is absurd: it suggests that the property of being identical to Sol is playing some causal role in  $x$ 's elliptical motion around  $y$ —which it cannot be. In other words, *being numerically identical to Sol* is not a natural kind of property (Tomkow 1992). The point is completely general, of course, in that *being numerically identical to  $x$*  is not a natural kind property in any science trafficking in empirical laws no matter how specialised. The metaphysical essences of things are not natural kinds of properties in virtue of which they are responsible for effects. That special sciences are intended to be limited in the range of phenomena to which they apply does not mean that they are not intended to apply to exact duplicates of those phenomena. It might have been otherwise, of course. To paraphrase Fodor (1987, p. 40), it is a contingent fact about how God made the world that the mechanisms by which causes have their effects are not sensitive to the haecceities of things.

(2) The same considerations apply to the properties of *being related to Elvis* and *being related to Twin Elvis*. These relational properties do not affect the causal powers of the thoughts of the subjects who have them. Again, the reason is obvious: the metaphysical essences or haecceities of individuals—the difference between Elvis and Twin Elvis—and the scientific essence of natural kinds—the difference between H<sub>2</sub>O and XYZ—are, psychologically speaking, causally irrelevant. Obviously, laws do advert to H<sub>2</sub>O; but these laws are chemical laws, not psychological laws. H<sub>2</sub>O is a chemical natural kind and not a psychological natural kind. Psychological laws connecting mental states and behaviour will not advert to properties like *being related to Elvis* or *being related to H<sub>2</sub>O* because they are not properties to which subjects are sensitive. Like the laws of astronomy, the laws will not make any reference to the metaphysical essences of individuals. The psychological laws will operate only with those qualitative properties that subjects can discriminate, such as *being related to someone with an Elvis appearance* or *being related to something with a waterish appearance*. In psychological explanations

these laws will then be instantiated by particular individuals (e.g., Elvis, Twin Elvis) or particular kinds of stuff (H<sub>2</sub>O, XYZ). It is in the statement of initial conditions that reference to such individuals and stuffs will occur. In short, it is crucial not to confuse laws with their instantiations or statements of initial conditions.<sup>13</sup>

The idea, then, is that there will not be any psychological laws whose projectible properties are beyond the threshold of discrimination of the creatures to which the psychology applies. In the case of normal humans, there will not be any psychological laws such as:

(PL3)  $\forall x(x = \text{Elvis} \ \& \ x \text{ is seen by Roxanne} \rightarrow x \text{ will be asked by Roxanne for an autograph})$

(PL4)  $\forall x \forall y(x = \text{H}_2\text{O} \ \& \ x \text{ is seen by } y \rightarrow y \text{ thinks } x \text{ is called 'water'})$ ;

or laws sustaining counterfactuals such as: 'If x were not identical to Elvis then Roxanne would not have asked x for an autograph' and 'If y were not identical to H<sub>2</sub>O then x would not have thought that y was called "water"'. Rather, psychological laws will most probably be something like the ones adumbrated in the previous section:

(PL5)  $\forall x(x \text{ has an Elvis appearance} \ \& \ x \text{ is seen by Roxanne.} \rightarrow x \text{ will be asked by Roxanne for an autograph})$

(PL2)  $\forall x \forall y(x \text{ has a waterish appearance} \ \& \ x \text{ is seen by } y. \rightarrow x \text{ comes to be believed by } y \text{ to be called 'water'})$ ,

or laws that sustain counterfactuals like: 'If x had not had an Elvis appearance then Roxanne would not have asked x for an autograph' and 'If x hadn't had a waterish appearance ... then x wouldn't have come to be believed by y to be called "water"'. It is (PL5) that are part of the explanation of why Roxanne does not ask Elvis for his autograph when he is in disguise and does ask an Elvis impersonator, when he is dressed up as Elvis, for his autograph. The covering-law explanation for Roxanne's asking Elvis for his autograph would then be something like:

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<sup>13</sup> The point that Fodor has confused laws with their instantiations is made by Evans in his commentary (1980) on Fodor's brief for methodological solipsism. Cf. Peacocke 1981, p. 202.

(PL5)  $\forall x(x \text{ has an Elvis appearance} \ \& \ x \text{ is seen by Roxanne.} \rightarrow x \text{ will be asked by Roxanne for an autograph})$

(C1) Elvis has an Elvis appearance, is seen by Roxanne, ...

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(E1) Roxanne asked Elvis for an autograph

and the explanation for Roxanne's asking Twin Elvis, or an Elvis impersonator for that matter, for his autograph would then be:

(PL5)  $\forall x(x \text{ has an Elvis appearance} \ \& \ x \text{ is seen by Roxanne.} \rightarrow x \text{ will be asked by Roxanne for an autograph})$

(C2) Twin Elvis has an Elvis appearance, is seen by Roxanne, ...

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(E2) Roxanne asked Twin Elvis for an autograph.<sup>14</sup>

Similarly, to move to a case of a person's interaction with a natural kind rather than an individual, the covering-law psychological explanation of Ralph's drinking some sample of H<sub>2</sub>O in front of him would then be something like:

(PL2)  $\forall x \forall y(x \text{ is believed by } y \text{ to be called 'water' and } y \text{ is thirsty and } y \text{ wants not to be thirsty.} \rightarrow x \text{ drinks } y)$ .

(C3) A sample of H<sub>2</sub>O was believed by Ralph to be potable, ...

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(E3) Ralph drank the sample of H<sub>2</sub>O

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<sup>14</sup> One can reject a monolithic view of the covering-law model of the logic of explanation and still hold, plausibly, that it does manage to capture a significant class of explanations found in the sciences and in commonsense. For a defence of the application of the covering-law model to commonsense psychological explanation see Morton (1975). As Hempel pointed out in one of his late papers, for such explanations to be deductive the explanans must include a statement, what Hempel calls a 'proviso', to the effect that no factors not mentioned in (PL5) that are relevant to the outcome of the event described by (E1/2) are present, that (PL5) states the whole truth about the relevant circumstances present. The issue of provisos and '*ceteris paribus*' or 'hedged' laws is a difficult and under-researched area in the philosophy of science that has only recently received the attention it deserves. For recent work, see Hempel (1988) and Pietrosky and Rey (1995) and Earman and Roberts (1999). Though there is debate about whether the provisos needed in psychological explanation differ in kind or only in degree from those found in other explanatory schemes—on this see the debate between Fodor (1987, chapter 1; 1989) and Davidson (1980, 1987, 1993)—I must leave the issue moot here.

and the explanation of Ralph's similar behaviour *vis-à-vis* XYZ would then be:

(PL2)  $\forall x \forall y (x \text{ is believed by } y \text{ to be called 'water' and } y \text{ is thirsty and } y \text{ wants not to be thirsty.} \rightarrow x \text{ drinks } y).$

(C4) A sample of XYZ was believed by Ralph to be potable, ...

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(E4) Ralph drank the sample of XYZ.

The psychological covering laws (PL5) and (PL2) are the same, respectively, in both cases, despite the fact that Roxanne is related to different individuals in her two different situations and Ralph is related to different liquids in his two different situations (Cf. Peacocke, *loc cit*). Now, (PL5) and (PL2) are only sketches of what the real psychological laws would look like; the statements of initial conditions (C1) - (C4) are similarly sketchy. Better approximations would make reference to demonstrative modes of presentation of liquids and celebrities. Similarly, the relational or *de re* ascriptions that form the initial conditions would have to include reference to Roxanne's and Ralph's demonstrative modes of presentation of the respective objects and stuffs they are acting on (cf. Peacocke, *loc cit* and Morton 1975).

This, then, is the sense in which a scientific psychology that is a sophisticated extension of commonsense groups together twins whose thoughts may have different propositional and social content. The reason is that the propositional and social content of thoughts do not affect the causal powers of those thoughts. The relational properties that do affect the causal powers of thoughts are those such as *being related to someone with an Elvis appearance* (in the case of action on an individual) and *being related to a waterish liquid* (in the case of action on a stuff)—which brings us to the third pair of properties.

(3) Unlike the difference between *being a planet of Sol* and *being a planet of Twin Sol*, the difference between the properties of *being a planet* and *not being a planet* does, as Fodor maintains, affect the causal powers of the chunk of rock that has them:

It is because *this* rock-twin is a planet and *that* rock-twin is not that this rock-twin has a Keplerian orbit and that rock-twin does not; it is because this rock-twin is a meteor and that rock-twin is not that this rock-twin's effects include craters and that rock-twin's effects do not. But, patently, *being a planet* and *being a meteor* are relational properties in good standing. To be a planet is to be a rock (or whatever) that is revolving around a star; to be a meteor is to be a rock (or whatever) that is falling, or has fallen, into collision with another rock. (1991, p. 211)

Moreover, there are astronomic laws connecting *being a planet* with having a Keplerian orbit. The difference between 1a/1b type properties and 3a/3b type properties is crucial and has been crucially overlooked in the literature. So long as there is *something* with the properties of the sun in virtue of which it pulls Terra through its elliptical trajectory—namely, something with a certain mass and at a certain distance from Terra—it does not matter whether it is *Sol*. The point is that there must—in the nomological sense of ‘must’—be something that Terra is related to in order for it to behave Keplerianly.

(4) The same goes for the final pair of properties. It is the difference between *being related to something with an Elvis appearance* and *not being related to something with an Elvis appearance*, and not the difference between *being related to Elvis* and *being related to Twin Elvis* that affects the causal powers of Roxanne’s thoughts. It is because Roxanne is related to someone that *looks like Elvis* that she asks him for an autograph and it is because, counterfactually, Roxanne is not related to someone with an Elvis appearance that she does not ask anyone for an autograph. Similarly, to shift again to the natural kind case, unlike the difference between *being related to H<sub>2</sub>O* and *being related to XYZ* the difference between *being related to a waterish liquid* and *not being related to a waterish liquid* does affect the causal powers of Ralph’s thoughts. It is because Ralph’s thought is related to a waterish liquid that he comes to believe there is something called ‘water’ in front of him and reaches out to try to drink it. It is because, counterfactually, Ralph’s thought is not related to any waterish liquid that he does not do any of these things.

Of course, Ralph could have been brought to be in some internal state that was exactly like the one he is in when he actually spies a waterish liquid without him being related to any waterish liquid and so could have come to believe that there is something in front of him called ‘water’ and to reach out for ‘it’ even though nothing is there. Ralph could have been hallucinating or subject to nefarious neuroscientists. Similarly, Roxanne *could* have been hallucinating Elvis and so could have been brought to behave in an autograph-asking manner. Nevertheless, if there *were* no waterish liquid at all to which Ralph was related, he *would not* have reached out; and if there *had not* been anyone with an Elvis appearance, Roxanne *would not* have engaged in autograph-asking behaviour (Stalnaker, 1989). In the nearest possible world where there is no waterish liquid at all in front of Ralph, he does not hallucinate some or have his brain fiddled with by neuroscientists, and hence, does not reach out. In the nearest possible world in which Roxanne is not confronted

with someone who looks like Elvis, she does not start hallucinating Elvis. Again, contrast these true counterfactuals with the following false ones: If the waterish liquid in front of Ralph had not been identical to H<sub>2</sub>O then he would not have come to believe it was called 'water'; if the person in front of Roxanne had not been Elvis she would not have asked him for an autograph. In the closest possible world where the waterish liquid in front of Ralph is not H<sub>2</sub>O he still comes to believe it is called 'water' and tries to drink it. In the closest possible world where the person with an Elvis appearance in front of Roxanne is not Elvis she still asks him for an autograph. We are able to evaluate these counterfactuals thanks to our commonsense psychological knowledge that we behave towards things because of the observable properties they manifest to us.

To sum up, then, the lesson of Twin Earth is not that relational psychological properties do not affect causal powers. Rather, it is that certain kinds of relational psychological properties do not affect causal powers; in particular, those that make reference to facts that are beyond the threshold of human discrimination—for example, the individual or scientific essences of, respectively, things and stuffs. The problem with Putnamian and Burgean relational psychological properties is that they do make reference to these types of relational properties. The troublesome properties are 1a/b and 2a/b type ones. 3a/b and 4a/b type ones are perfectly in order. To generalise, we can formalise the latter properties using lambda notation:

(3a/4a)  $\lambda x[\exists y(Rxy \ \& \ Fy)]$

(3b/4b)  $\lambda x[\sim\exists y(Rxy \ \& \ Fy)]$ .

The first is the property of bearing a relation to something that has property F and the second is the property of not bearing a relation to something that has F. In the psychological case regarding a stuff like water, we have a pretty good general idea of what kind of property F is: it is the observable property of being odourless, colourless, tasteless, etc., which I have abbreviated as *having a waterish appearance*. In the case of individuals things are much trickier; it is much harder for us commonsense psychologists to say just which observable properties of individuals it is that we pick up on, especially when it comes to individuals that we know intimately such as our spouses and family members. Obviously, it is an empirical psychological question to be determined by experiment just exactly what aspects of things and individuals we

do detect. In the astronomical case, F is something like mass or distance. In contrast there is:

(1a/2a)  $\lambda_x[\exists y(Rxy \ \& \ y = a)]$

(1b/2b)  $\lambda_x[\exists y(Rxy \ \& \ y = b)]$ .

The former is the property of bearing a relation to something that is identical to a; the latter the property of bearing a relation to something that is identical to b. a might be Sol, Elvis, or H2O; b might be Twin Sol, Twin Elvis, or XYZ. The conclusion we are drawn towards is that the difference between  $\lambda_x[\exists y(Rxy \ \& \ Fy)]$  and  $\lambda_x[\sim\exists y(Rxy \ \& \ Fy)]$  is a difference between causal powers in virtue of its being responsible for a certain difference between effects; whereas the difference between  $\lambda_x[\exists y(Rxy \ \& \ y = a)]$  and  $\lambda_x[\exists y(Rxy \ \& \ y = b)]$  is not. It follows that Fodor is right that Putnamian and Burgean twins belong to the same psychological natural kind.

Two final remarks are in order. First, the claim that the difference between  $\lambda_x[\exists y(Rxy \ \& \ y = a)]$  and  $\lambda_x[\exists y(Rxy \ \& \ y = b)]$  does not affect causal powers does not contravene the essential non-universal and environment-bound nature of the special sciences. That special sciences such as geology, biology, astronomy, and psychology presuppose a normal background of contextual relations in which things stand is consistent with holding that the Ralphs and Alfreds are the same psychological natural kinds. (PL2), for example, subsumes both Ralph and Twin Ralph. Second, we cannot be accused of illegitimately *a priori* about the kind of taxonomy that the special sciences in general and psychology in particular are constrained to adopt (this complaint is mad by Burge, 1986, 1989, 1995 and Baker, 1995). For we have arrived at the very general view that properties like  $\lambda_x[\exists y(Rxy \ \& \ Fy)]$  are candidates for natural kinds while properties like  $\lambda_x[\exists y(Rxy \ \& \ y = a)]$  are not by reflection on the broadly empirical knowledge implicit in commonsense.

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