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A NONREDUCTIVIST SOLUTION TO MENTAL CAUSATION

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**ABSTRACT.** Nonreductive physicalism provides an appealing solution to the nature of mental properties. But its success as a theory of mental properties has been called into doubt by claims that it cannot adequately handle the problems of mental causation, as it leads either to epiphenomenalism or to thoroughgoing overdetermination. I argue that these apparent problems for the nonreductivist are based in fundamental confusion about causation and explanation. I distinguish two different types of explanation and two different relations to which they appeal: causation and determination. I argue that these types of explanation do not compete with one another, nor do these relations jointly result in overdetermination. In closing I develop a nonreductivist solution to mental causation which avoids both the hazards of epiphenomenalism and of overdetermination and so demonstrates a way to save nonreductive physicalism from the problems of mental causation.

Many are those tempted by some version of nonreductive physicalism. The attractions of such a view are obvious: The nonreductivism should ensure that mental properties are preserved in all of their distinctive character, while the physicalism should ensure that we nonetheless offer a view of mind compatible with a scientific world-view. But this appealing solution has been brought into doubt by arguments that the nonreductive physicalist faces an unpleasant dilemma regarding mental causation.

Either mental properties have causal efficacy or they don't. If they don't, then we seem to be left with a kind of epiphenomenalism about the mental. But epiphenomenalism has unpleasant consequences: First, it seems it would force us to give up our intuitions that our beliefs, desires, and so on *do* have a causal impact on the world. Secondly, if all mental properties lack causal powers, then there seems little reason to postulate them; they would fail tests such as Alexander's dictum: "To be real is to have causal powers". But the other horn of the dilemma, that mental properties do have causal powers, is hardly more palatable. If we allow higher-level mental

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properties to have causal powers, we seemed threatened with a thoroughgoing overdetermination of many sorts of events which are caused both by instantiations of mental properties and of physical properties. Worse still, if we allow that mental properties may have causal effects at the physical level, we risk violating the causal closure of the physical. Fear of facing this dilemma has substantially dimmed the initial appeal of nonreductive views of mental properties.<sup>1</sup>

One way out now acknowledged even by Jaegwon Kim, who develops such arguments against nonreductive physicalism in great detail, is to embrace functionalism.<sup>2</sup> As a functionalist one can maintain the view that mental property types are not reducible to physical property types, and yet allow that instances of mental properties are identical with instances of physical properties. If mental and physical property instances are identical, instances of mental properties will have all of the causal powers of the physical property instances (thus avoiding epiphenomenalism), and yet there will be no danger of overdetermination since there is but one entity at work as the cause.

The functionalist way out, however, is unlikely to fully satisfy many nonreductivists. For there seem to be at least two good reasons to resist the idea that mental property instances are identical to their physical bases: unlike physical property instances, they seem to have an essential qualitative nature, and in some cases at least they seem to have essential semantic or contentual features which also depend in part on external (“wide”) social and physical context. Those impressed by these features of our mental life will want to resist the ontological reduction of mental property instances to the physical, and thus, it seems, be left with the original dilemma.

The purpose of this paper is to examine the prospects for a different solution, one that preserves the distinctive status of the mental by maintaining the irreducibility of mental property instances, as well as mental property types, to their physical basis. The alleged difficulties such views face with mental causation, I will argue, are merely apparent problems based in fundamental confusion about causation and explanation. Thus it would be a mistake to abandon such nonreductive physicalist views because of fears about handling mental causation.

Closer consideration of these issues shows the way to an account of mental causation that provides an appropriate causal role for mental properties without giving up ordinary principles about causation or abandoning the idea that the physical world is ontologically and causally primary. If it can avoid the alleged problems of mental causation, nonreductive physicalism may after all provide a viable and appealing understanding of the mental.

### I. CAUSATION

There are several different relations indifferently and equivocally referred to as relations of 'causation'. It was to avoid this equivocation that Aristotle distinguished no fewer than four 'causal' relations, carefully isolating efficient causation from material, final, and formal causation.<sup>3</sup> Different sorts of explanation may appeal to different underlying relations. Thus there may be more than one explanation of an event without these explanations being in competition, and there may be more than one such relation involving the event without its being causally overdetermined. Indeed far from holding that explanations involving different types of cause compete, Aristotle held that a complete explanation of an event is one which appeals to *all* of these types of cause.

I will begin by considering explanation, and thereafter turn to examine the different ontological relations underlying the different types of explanation. Consider the following: Upon pulling his sock out of the dryer, John notices the following state of affairs: The sock is pink. Annoyed at this, John turns to his roommate, Tom, to ask for an explanation. Tom might offer two different explanations of that state of affairs. The natural explanation might be something like this: the sock is pink because it was washed with a new red sweatshirt. But, if he is feeling recalcitrant, Tom might offer instead the following explanation: the sock is pink because its component matter has a certain microstructure that preferentially reflects those wavelengths of light making up pink. Or, consider a parallel case: These cookies are hard. Why are they so hard? Explanation 1: They were overcooked. Explanation 2: Their molecules are very tightly bonded.

In neither case do the two explanations compete with each other.<sup>4</sup> Indeed so far are they from competing that anyone who offered these

as alternative explanations would be thought to be making a bad joke. They can both be true without there being any tension between them, or any need to ask which is the unique true explanation. They each provide a different kind of explanation. The first explanation in each case (the sock was washed with a pink sweatshirt, the cookies were overcooked) appeals to the causal factors in the past that brought about the present state of affairs. The second explanation in each case (the sock is pink because its matter absorbs light of all other wavelengths, the cookies are hard because their molecules are very tightly bonded) appeals to the underlying physical basis for the state of affairs at this moment. Call these explanation<sub>1</sub> and explanation<sub>2</sub> respectively.

These two types of (non-competing) explanation refer to two different types of relation. Although on occasion these may both be indifferently referred to as 'causal', it is extremely important to distinguish them. (There may be still more types of relation appealed to in common discussions of causation, but distinguishing these two will prove sufficient for present purposes). We can distinguish them preliminarily as follows. Let us call the relation appealed to in the first explanation of each case 'causation', which is at least typically a diachronic relation between an earlier event and a later one that it brings about. The relation appealed to in the latter explanation of each case I will call 'determination'.<sup>5</sup> As I shall use the term, 'determination' refers to a synchronic relation between higher-level entities and the lower-level entities that contribute to their being the way that they are. Concrete higher-level entities that are materially constituted by physical entities, for example, are largely determined by their physical bases.<sup>6</sup> (Aristotle's efficient cause seems closest to what I have labeled 'causation', while his material causation provides a central case of what I call 'determination'.) A particular state of affairs (the sock's being pink, the cookie's being hard) may be both caused to be a certain way and determined to be that way. These relations do not exclude each other, nor does the presence of both of them constitute causal overdetermination, since only one of them is causal. Armed with this distinction, let us return to examine the arguments that the nonreductivist faces troubles with mental causation.

## II. KIM'S ARGUMENT AND RESPONSE TO KIM

The toughest criticisms of nonreductive physicalism have come from Jaegwon Kim's arguments that the nonreductivist faces insuperable problems with mental causation. Kim argues, first, that the nonreductive physicalist should choose the second horn of the dilemma about mental causation: That mental properties do have causal powers. For, he says, following Alexander's dictum, we should only postulate entities that have new causal powers (which no physical thing can deliver).<sup>7</sup> So the nonreductive physicalist must accept that mental properties have causal powers. Kim plausibly suggests that the most likely place to look for the causal powers of mental properties is in their power to cause instances of other mental properties; these, at least, should present the easier cases than purported cases of downward (to the physical) or upward (to the social) causation.<sup>8</sup> So, for some instances of mental properties  $M$  and  $M^*$ ,  $M$  causes  $M^*$ . But, since the nonreductive physicalist also insists that all mental properties are physically realized, she must also admit that  $M^*$  is physically realized by some physical property  $P^*$ . It is here that the purported trouble arises:

Now we seem to have two distinct and independent answers to the question, Why is this instance of  $M^*$  present? *Ex hypothesi*, it is there because an instance of  $M$  caused it; that's why it's there. But there is another answer: it's there because  $P^*$  physically realizes  $M^*$  and  $P^*$  is instantiated on this occasion. I believe these two stories about the presence of  $M^*$  on this occasion create a tension and must be reconciled.<sup>9</sup>

From there Kim proceeds to reject several views about how these views could be reconciled.  $M$  can't be jointly causally responsible with  $P^*$  for  $M^*$  since  $P^*$  is alone sufficient:

... every instance of  $M^*$  must have some physical base that is by itself sufficient for  $M^*$ ; and this threatens to preempt  $M$ 's claim to be the cause of this instance of  $M^*$ .<sup>10</sup>

It can't be just that  $M$  is physically realized in  $P$ , which causes  $P^*$ , since this leaves  $M$  no causal work to do in bringing about  $M^*$  and so leaves mental properties in violation of Alexander's dictum. And so, Kim concludes, the only way out is to say that  $M$  is causally responsible for  $M^*$  by causing  $P^*$ . In other words, the only way to make sense of cross-level causation is by resorting to downward

causation. But that would leave  $P^*$  overdetermined – caused by both  $M$  and  $P$ . It seems that  $M$  is bound to be the loser in this competition.

This unsavory conclusion derived from Kim's claim that there are two distinct and competing explanations for the presence of  $M^*$  on the occasion in question: Because  $M$  caused it or because  $P^*$  physically realizes it. These explanations, Kim claims, "create a tension and must be reconciled". But do they? It seems to me that they do not. The word 'because' is being used equivocally; these cases offer two different types of explanation. In the first case, " $M^*$  is there because  $M$  caused it" expresses a causal relation between  $M$  and the  $M^*$  it brings about. This is an explanation<sub>1</sub>, parallel to the explanation that the sock is pink because it was washed with a red sweatshirt. In the latter case, " $M^*$  is there because  $P^*$  physically realizes it" expresses a relation of material constitution and determination between  $P^*$  and  $M^*$ . This is an explanation<sub>2</sub>, parallel to the explanation of the sock's pinkness in terms of its microstructure. Just as there is no tension between the two explanations of the sock's color, so is there no tension between these explanations of the mental property. They are different types of explanation appealing to different relations:  $M$  caused  $M^*$ , while  $P^*$  determines  $M^*$ .

The initial plausibility of Kim's argument derives only from our mistaken tendency to confuse causation and determination, or to think of determination as a causal relation. Despite his care at some points not to label it such, Kim clearly is tempted to think of physical realization this way:

When  $P$  is said to "realize"  $M$  in system  $s$ ,  $P$  must specify a microstructural property of  $s$  that provides a *causal mechanism for the implementation of  $M$  in  $s$*  ...<sup>11</sup>

The tendency to think of physical realization, one relation involving what I have called 'determination', as a causal relation might make it seem that there is an irreconcilable tension between these two explanations. But if we bear in mind the parallel cases where we are less likely to be led astray than in the labyrinths of the mind-body problem, we can see quite clearly that the problems lies not with mysteriously competing explanations of mental events but merely with failing to distinguish different types of explanation and the relations they describe.

## III. THE “LAYERED” SOLUTION

If the foregoing is correct, then the widely accepted arguments based on purported troubles with mental causation give us no reason to abandon nonreductive physicalism. Yet the question remains of how a thoroughly nonreductive physicalist could offer a positive resolution to the difficulties of mental causation without falling into epiphenomenalism or violating principles about causation. The details cannot be completely worked out here, but the following sketch should demonstrate how such a solution could be drawn out.

The solution is based on the very view Kim argues against, which he refers to as a “layered” view of the world.<sup>12</sup>

It is generally thought that there is a bottom level, one consisting of whatever microphysics is going to tell us are the most basic physical particles out of which all matter is composed . . . As we ascend to higher levels, we find structures that are made up of entities belonging to the lower levels, and, moreover, the entities at any given level are thought to be characterized by a set of properties distinctive to that level.<sup>13</sup>

One common tenet of such layered views is that causation occurs only within a level; there is no upward or downward causation. Layers are not connected by causal relations but by relations of determination, dependence and material constitution. Provided that she adheres firmly to this principle, the nonreductivist can avoid Kim’s problems and find a way out of the dilemma of mental causation.

Suppose that there are different levels of properties, where the higher level properties are dependent on (ultimately exclusively dependent on) lowest level, purely physical, properties, but not reducible to them. Mental properties are placed among the higher level properties; each mental property instance could be said to depend on the particular physical property instance in which it is realized. We can add, moreover, that each mental property instance is ultimately exclusively dependent on and fully determined by the physical, though perhaps not only that physical property instance on which it depends – it may also depend on and be partially determined by features of the physical and even social context surrounding it, provided that the social context in turn is ultimately exclusively dependent on the physical. This ensures the primacy of the physical and the dependence of the mental on it. Nonetheless, according to this view, in virtue of their semantic, contentual or qualitative features

or their dependence on the surrounding social context, mental properties at the level of both type and token cannot be identified with the physical properties upon which they depend.

Now suppose that not only the most fundamental properties, but also the most fundamental causal relations (and objects) are at the basic microphysical level. Nonetheless, just as there may be higher-level objects and properties that depend on but are not reducible to fundamental objects and properties, so may there be higher-level causal relations that depend on lower-level causal relations without being reducible to them. This dependence seems plausible. Consider a higher-level causal relation such as: The speculation of investors caused the stock-market crash. We are unlikely to credit this causal story unless there were also relations grounded in fundamental physical interactions between the speculators and traders – if there were no interactions via phone calls, faxes, or what have you, we would rule out these speculations as irrelevant to the crash. Insisting that such higher-level causal relations are themselves *dependent* on fundamental causal relations should mitigate the impression that mysterious new powers are being brought in at the higher levels: these causal relations, like the events they connect, are ultimately dependent only on entities at the basic physical level.

Then the nonreductivist's answer to the question. "Does the mental have causal powers?" should be "Yes: there are distinct, dependent, but not reducible causal relations involving instances of mental properties". This solution avoids the first horn of the dilemma. It is not epiphenomenalism because it allows there to be causal relations among higher-level entities (though these relations, like the properties, are dependent). Thus we need not give up intuitions that our mental properties enter causal relations with our actions, that the decisions of traders enter causal relations with the stock market and so on.

Moreover, mental properties so conceived satisfy Alexander's dictum that to be real is to have distinct causal powers. For an instance of a mental property  $M$  may have the power to cause  $M^*$ . Since  $M^*$  is a higher-level property, it does not appear at the basic physical level, and so no causal relation of the form  $P$  causes  $M^*$  can obtain at a lower level. Nor can it obtain across levels, since there is no cross-level causation.  $M^*$  may be dependent on, determined by,

even materially constituted by physical properties, but not caused by them. So *M* has a causal power that no physical property has, namely the power to cause *M\**. And so *M* satisfies Alexander's dictum.

But allowing mental properties to have causal powers in this sense does not lead to causal overdetermination. *P\** is not overdetermined because *M* does not cause *P\**. We have no need to posit a downward causal relation between *M* and *P\** because there is no tension between explanations of *M\** in terms of its causation by *M* and determination by *P\**, and so no need to route *M*'s causation of *M\** via *P\**. And so *P\** has only one cause – a physical property *P*. Thus there is also no violation of the causal closure of the physical, since downward causation is ruled out on this view.

One might fear that even if *P\** is not overdetermined, *M\** is overdetermined by being caused by both *M* and *P\** (in which it is physically realized). But only *M* causes *M\**, while *P\** determines it. *M\** is no more overdetermined by its relations to its cause and physical basis than the cookie's hardness is overdetermined by the cooking and the tight bonding of molecules.

Even those who agree this far may still fear that there is some overdetermination going on. It may be agreed that *M\** is not overdetermined via *M* and *P\**, yet, it might be said, the real competitor for the cause of *M\** is *P*, not *P\**: The causal story that seems to compete with *M* causing *M\** is the one that runs across the physical level. Thus in the cookie analogy the real causal competitor for the higher-level story told simply in terms of overcooking might be that the prolonged heating causes the emulsion bonds in the dough to break down, causing the evaporation of water molecules and the replacement of weak emulsion bonds with strong rigid bonds among remaining fat and carbohydrate molecules.<sup>14</sup>

But if we carefully maintain the initial distinction between causation and determination, this threat also may be held at bay. We may tend to casually, and harmlessly, speak of such relations as "causal" in ordinary conversation, but if we respect the philosophical distinction between causation and determination, we can see that there is equivocation at work in our desire to call *P* the "cause" of *M\**; the same equivocation which the distinction between causation and determination was meant to eradicate. The prolonged heating causes the breakdown of the emulsion bonds and their replacement with

strong rigid bonds among molecules. And it is by thinking transitively that we then wish to say that the strong rigid molecular bonds “cause” the cookies to be hard. But this move makes use of the two senses of “causation”: causation in the first case and determination in the second case. If we keep them distinct, the presence of strong rigid molecular bonds cannot be properly said to “cause” the cookie’s hardness; instead, it forms the physical basis for that hardness.<sup>15</sup> Put more formally, in the case of a physical property P purportedly causing mental property M\*, M\* is not overdetermined by being caused by both M and P. For although P causes P\*, since P\* does not cause M\* (but determines it), P does not transitively cause M\*. It merely causes the physical event in which M\* is physically realized. And so M\* has only one cause, namely M.

Nor is there non-causal overdetermination of M\* or competition among explanations of M\*. Observations that both P\* and M are (in some sense) sufficient for M\* should not mislead us into thinking that M\* must be overdetermined. As has been repeatedly observed, one should not confuse sufficiency with causation.<sup>16</sup> P\* and M are “sufficient for” M\* in different ways: One is sufficient to bring it about, the other is its sufficient physical basis. In short, as I have argued above, the relations of causation and determination do not exclude or compete with one another. M\* is no more overdetermined than the pink sock is overdetermined by being turned pink through careless washing and determined to be pink by having a certain microstructure; the explanation in terms of causal history does not compete with that in terms of current physical basis.

If the foregoing is correct then the nonreductive physicalist can after all provide a consistent answer to the dilemma of mental causation: Just as mental properties are dependent on but not reducible to the physical properties that realize them, so are there causal relations among mental properties that are dependent on but not reducible to fundamental physical causal relations. By maintaining the ultimate dependence of the mental on the physical, and of higher-level causal relations on fundamental physical causal relations we preserve the primacy of the physical, but do so without saying that all causal powers are just the causal powers of fundamental physical entities.

## IV. ASSESSMENT

The solution proposed has many virtues: It enables us to preserve mental properties in all of their distinctive nature, to provide them with an appropriate causal role, to avoid problems of overdetermination or violation of the causal closure of the physical, and at the same time to preserve a scientific world view that sees the physical world as fundamental.

But the problem of mental causation is indeed a thorny one and no solution to it is likely to be entirely without cost. The solution proposed above is no different in this regard. The main apparent drawback is that it prevents us from accepting at face value ordinary claims of physical-mental and mental-physical causation, since on this view causal relations do not hold between levels. Thus, for example, it cannot be literally true on this view that ingesting the drug caused the headache to go away, nor can it be literally true that Julie's deciding to swing the baseball bat caused the ball to fly in an arc and break the window.<sup>17</sup>

Cases of purported physical/mental causation such as medication causing one's headache to go away are fairly easily handled as simple cases of harmless "loose talk". In common parlance we may speak of this all as causation, but what is really going on is a causal relation (the medication causing the change in noradrenaline activity, causing the resumption of normal blood flow to the cortex) and a determination relation (the resumption of normal blood flow to the cortex determines and is the physical basis for the ceasing of the headache). This seems to me to provide an appropriate analysis which preserves the idea that such claims are, in some sense, true, provided the appropriate distinctions are preserved.

It is somewhat more difficult to provide a satisfying analysis of cases of purported mental/physical causation on this model. Yet there are mitigating factors which can make this easier to accept. First, it should be noted that, although this picture rules out downward mental causation of fundamental physical events, there can be mental causation of higher-level events such as resignations, wars, stock market crashes, professions of love, or acts of vandalism. For these themselves, as full cultural events with meanings in the social human world, likewise are based in the physical world but are not mere fundamental physical entities. Thus, for example, Julie's deci-

sion could be said to cause higher-level events such as the school's suffering yet another act of vandalism, Julie's feeling avenged, or Julie being wanted by the local authorities. Such higher-level causal relations in turn depend upon lower-level causal relations such as her neurons sending signals causing her muscles to contract, the bat to swing, the ball to fly, and the glass to shatter.

Limiting the causal powers of the mental to higher-level events, ruling out effects at the basic physical level, may not seem so bad if we remember the alternatives. The choices among nonreductive views seem to be the following: 1) Choose functionalism and identify instances of mental properties with their physical bases, at risk of losing the essential qualitative, semantic, or contentual features of mental or 2) Remain nonreductivist at both type and token levels and a) Treat the mental as epiphenomenal (clearly a less attractive option for those who take intuitions about mental causation seriously) or b) Accept mental-physical causation and its attendant thoroughgoing overdetermination and violation of the causal closure of the physical or c) Postulate mental causation, but limit it to higher-level events. Once the alternatives are made evident, many nonreductivists might find that the costs of positing only higher-level causal relations fade in comparison to the costs of losing the distinctive status of the mental or accepting overdetermination and violating the causal closure of the physical.

The availability of a consistent reply to Kim's challenge should at least establish that arguments such as Kim's give us no reason to abandon nonreductive physicalism. Whether we have positive reason to accept nonreductive physicalism and therewith embrace the idea that higher-level properties such as mental properties can enter into higher-level causal relations is a further matter. Ultimately, the nonreductive physicalist will owe us an account of what these higher-order causal relations are, under what conditions they obtain, and so on. Likewise, she will owe us a more thorough analysis of the relations of determination and causation. Only thereby can we properly evaluate the nonreductivist picture. Nonetheless, I hope this does enough to show that the project of a nonreductive physicalism – even one that denies the identity of mental and physical property instances – is far from dead, and to suggest a direction to take in shoring up such a view. To give up a nonreductivism that insists

on the unique and distinctive status of mental properties because of fears that it has no consistent reply to the dilemma of mental causation would be to abandon an interesting and promising theory prematurely.

Kim closes his second Postscript on Mental Causation with the following assessment:

Ultimately, we are likely to face the following choice: either embrace the [functionalist's] realization view and save mental causation, or insist on the unique and distinctive status of mental properties, especially the qualia, but be prepared to give them up as causal powers . . . If you choose the former, you may lose what makes the mental distinctively mental, and what good is it, one might ask, if you save mental causation but end up losing mentality in the process? . . . If you choose the latter, you may again lose the mental, for what good is something that is causally impotent? . . . We therefore seem to be up against a dead end. Perhaps, that is what's really so intractable about the problem of the mind.<sup>18</sup>

What I have been suggesting is that there is another, perhaps more appealing, option. For we *can* preserve the distinctive status of mental properties (instances as well as types) and also preserve an appropriate causal role for them, without giving up ordinary principles about causation or the idea that the physical world is primary. If it can be made to work, there may be a path out of the dead end, and the problem of the mind may not be so very intractable after all.<sup>19</sup>

#### NOTES

<sup>1</sup> Since the purported problem arises by considering mental properties to be higher-level properties, it would also apply to non-reductive views of other sorts of properties such as economic and social properties. Thus the issue of how to handle causation within a nonreductive physicalism reaches far beyond issues in the philosophy of mind; what is at stake more generally is the ability to take any kind of property to be both higher-level and causally efficacious. Nonetheless, as it is in the philosophy of mind that this problem has received the greatest attention, I will focus on that aspect of the problem here.

<sup>2</sup> "Postscripts on Mental Causation" in *Supervenience and Mind* (New York: Cambridge University Press, 1993), pp. 362–367.

<sup>3</sup> See *Physics* II.7; 22–25.

<sup>4</sup> Steven Yablo develops a different sort of "no competition" argument based in the idea that mental properties stand to physical in the relation of determinable to determinate. See his "Mental Causation" (*The Philosophical Review*, Volume 101, No. 2, April 1992). Unlike his, the no-competition argument advanced here does not rely on the idea that physical properties are properly seen as determinates of mental properties.

<sup>5</sup> “Determination”, like “causation”, is sometimes used in different ways to signify different relations. Indeed it is occasionally used as a cover-all term to include causation as well as the upward determination of higher-level entities by their lower-level bases discussed here. What is required is simply a consistent usage that clearly separates out the two meanings, which I have stipulated using the familiar terms “causation” and “determination”, but this is merely a terminological choice.

<sup>6</sup> Determination, however, is not the same as material constitution. A concrete entity may be determined by other factors than its own material make up, as the shape of a balloon may be partly determined by the surrounding air pressure, or the meaning of an utterance may be partly determined by the relevant social practices. Dependent abstract entities, such as fictional characters, although they are not materially constituted, may also be determined by aspects of the stories in which they appear. Thus while the paradigm cases of determination such as those discussed below are cases where the determining entity materially constitutes the determined entity, determination is in fact a broader relation that does not merely hold between entities and their material bases.

<sup>7</sup> Leonard Clapp has pointed out that it is not clear that Alexander’s dictum demands that these causal powers must be *new*, although Kim interprets it as such.

<sup>8</sup> “The Nonreductivist’s Troubles with Mental Causation”, in *Supervenience and Mind*, p. 351.

<sup>9</sup> *Ibid.*, p. 351.

<sup>10</sup> *Ibid.*, p. 352.

<sup>11</sup> *Ibid.*, p. 343 (*italics mine*).

<sup>12</sup> This may not be the only possible resolution; I am grateful to Michael Watkins, Anthony Dardis, and Leonard Clapp for the clear formulation and helpful discussion of other solutions.

<sup>13</sup> *Supervenience and Mind*, p. 337.

<sup>14</sup> The accuracy of claims regarding the physics of cookie dough cannot be guaranteed.

<sup>15</sup> There may be those who resist the above example by insisting that the cookie’s hardness *is* the strong rigid bonds among its molecules, so that in fact the physical causal chain is the only one. But the issue here is not whether nonreductivism is *true* concerning hardness or mental properties – that must be argued separately, and certainly there is a much stronger case to be made for nonreductive views of mental properties than of a property such as hardness. The issue here is merely whether, if we postulated a nonreductive view, it would encounter insuperable difficulties with mental causation. The cookie analogy is simply intended to make it clear how a reply to this objection could go for someone maintaining a nonreductive view, its success in this regard does not depend on accepting a nonreductive view of hardness.

<sup>16</sup> See, e.g., the introduction to Ernest Sosa and Michael Tooley, *Causation* (Oxford University Press, 1993).

<sup>17</sup> Thanks to James Garson and an anonymous member of the audience at the 1997 Pacific APA presentation of this paper for these examples.

<sup>18</sup> *Supervenience and Mind*, p. 366–7.

<sup>19</sup> This paper took shape as a result of discussions at the 1996 National Endowment for the Humanities summer seminar “The Metaphysics of Mind”. Thanks go to the National Endowment for the Humanities and to John Heil and the seminar

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