SUPERVENIENCE AND OBJECT-DEPENDENT PROPERTIES*

It is hardly ever doubted that everything that exists in space and time is made up from stuff which is ultimately physical. Everything there is in space and time is ultimately physical stuff, either complex or simple. But whether all the properties of the physical stuff are ultimately physical properties, either complex or simple, is much more controversial. Most philosophers, I think it is fair to say, suspect that the answer is no. But giving up that all properties of physical things are physical properties is not to give up a physicalist world view. The standard way to reconcile nonphysical properties of physical objects with a physicalistic world view is to claim that the physical properties determine all the properties. Thus the physical properties of a physical object determine what nonphysical properties that physical object has. Or to put it differently, the nonphysical properties of physical objects supervene on their physical properties. This might not be sufficient to defend a physicalistic world view since by itself it leaves many questions unanswered: How do the physical properties determine the nonphysical ones? Why do particular nonphysical properties supervene on particular physical properties? And so on. However, the supervenience of the nonphysical properties of physical objects on their physical properties is generally believed to be a necessary condition for a satisfactory physicalistic world view, and an acceptable version of physicalism.

In this paper I will argue that the supervenience of the nonphysical

on the physical is incompatible with a certain metaphysical view about properties, the view that there are object-dependent properties. This latter view, in turn, is implied by a widely held view in the philosophy of language, the thesis of direct reference. Thus overall I will argue that direct reference and supervenience of the nonphysical on the physical are incompatible.

It might seem surprising how one could think that there is a conflict between direct reference and the supervenience of the nonphysical on the physical. After all, supervenience is a view in metaphysics and direct reference is a view in the philosophy of language. But such a conflict does arise because of a consequence about properties that direct reference has. Direct reference guarantees, as we will see, that some physical objects have object-dependent properties. And some of these properties have a special general feature, which I will capture with a notion to be defined below, that of a local uniqueness property. I will argue that local uniqueness properties cannot supervene on physical properties. To establish that there are local uniqueness properties and that some physical objects have them is the only role that direct reference and object-dependent properties play in this paper. The whole argument to follow could be spelled out by not mentioning direct reference at all, but instead by making the assumption explicit that there are local uniqueness properties. However, this assumption would certainly seem dubious, implausible, and farfetched, and therefore the whole argument will appear to be of little interest. By making clear that this assumption follows from the widely held thesis of direct reference, this can be avoided, and the overall conclusion will seem of much greater relevance. Thus my argument is an argument that direct reference and the supervenience of the nonphysical on the physical cannot both be true. This should be of interest since many philosophers, myself included, would like to believe in both. But if the argument to come is correct then there is a serious tension between these two views.

To establish my main conclusion that direct reference and supervenience are incompatible I will first have to say a little bit about direct reference, and then a little bit more about supervenience. After that I will establish, using direct reference as an assumption, that certain properties are local uniqueness properties. Finally, I will argue that if supervenience of the nonphysical on the physical is true then no property of a physical object can be a local uniqueness property. This will occupy most of this paper, and it is my main conclusion. The argument that establishes this conclusion can also be used to shed some light on an old debate about the identity of indiscernibles and its relationship to properties which are a *thisness* or *haecceitas.* I will

try to illuminate this debate in section v, after the main argument has been presented. Finally I will discuss some attempts to get around the main argument, and what lessons should be learned from all this.

I. DIRECT REFERENCE AND OBJECT-DEPENDENT PROPERTIES

Direct reference is a thesis in the philosophy of language. It is concerned with the semantic function of certain singular terms, in particular proper names. The thesis has many subtle features and notorious problems, but they will not take center stage in this discussion.[1] The most important thing here is the relationship between direct reference and object-dependent properties and propositions. To make this explicit I will characterize direct reference as follows: direct reference is true if some terms in our language are directly referential. A term is directly referential if the contribution it makes to the content of an utterance in which it occurs is merely the object referred to, as opposed to a mode of presentation, some description, or some other characterization of that object. In particular, the proposition expressed by an utterance containing a directly referential term will be an object-dependent proposition, it depends on the object that the directly referring term contributes. A proposition can depend on an object in at least two different ways. First, a proposition can depend on an object for its identity. That is, if Jones and Fred are one and the same then the proposition expressed by

(1) Jones is hungry.

and the proposition expressed by

(2) Fred is hungry.

are also one and the same. If the objects referred to are identical, and if there is no other relevant difference between utterances (like different disambiguation, and so on) then the propositions are identical. It only matters what object is referred to, not how it is referred to.

Second, a proposition can depend on an object for its existence. If a proposition depends on an object for its existence then the proposition exists only if the objects exist. So, if Jones does not exist then the object-dependent proposition that Jones is hungry does not exist either.

Usually direct reference is taken to imply object dependence for the propositions in both of these senses of object dependence. Since

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[1] For more details see François Récanati, *Direct Reference: From Language to Thought* (Cambridge: Blackwell, 1993).

the directly referring term contributed to the proposition expressed only the object referred to, it only matters what object is referred to, not how it is referred to. Thus we get dependence for identity. And since the object referred to is all that is contributed, if there is no object that is referred to, because what one attempts to refer to does not exist, then there is no complete proposition. In particular, the (complete) proposition does not exist if the object that one attempts to refer to does not exist. We do not have to debate here what things propositions are, but one way of looking at propositions nicely illustrates the point of the dependence of a proposition on individual objects both for identity and for existence. A Russellian view of propositions holds that they are structured entities, ordered sets that can contain regular objects as members. According to this view the proposition expressed by, say, (1) is the ordered pair consisting of Jones himself and the property of being hungry. If Jones does not exist then this set does not exist, and if Jones is Fred then the ordered pair consisting of Jones and a property is the same as the ordered pair consisting of Fred and that property. A Russellian theory of propositions illustrates object dependence in both senses, but we do not have to subscribe to it here as the correct model or account of object-dependent propositions.

Propositions are what is expressed by utterances of full sentences. Properties, on the other hand, are what is expressed by utterances of predicates. And what was said about object-dependent propositions applies, mutatis mutandis, to object-dependent properties. Thus utterances of predicates with a directly referring term in them express object-dependent properties, and a property can depend on an object for its identity and for its existence. So, if direct reference is true then an utterance of

    (3) is Jones's brother

expresses an object-dependent property, the same property as is expressed by

    (4) is Fred's brother

Since supervenience is usually formulated by taking recourse to properties rather than propositions I will mainly talk about properties in the following. However, one could just as well formulate supervenience in terms of propositions, or facts, or the like. The same arguments, mutatis mutandis, will go through.

Direct reference strictly understood is merely a thesis about what properties or propositions are expressed by our utterances of predicates or sentences. Strictly understood this is compatible with a global

semantic error thesis, the thesis that no utterances of sentences with directly referring terms in them are true, and that no predicates with such terms in them truly apply to anything.[2] Strictly speaking these are separate issues, but everyone who believes in direct reference believes that some utterances containing directly referring terms express true propositions. Which ones these are is, of course, a further question. So, I take the thesis of direct reference to contain a denial of global semantic error. Thus if direct reference is true then some sentences with directly referring terms in them can be truly uttered, and some predicates with directly referring terms in them truly apply to some objects. Simply put, some object-dependent propositions are true, and some objects have object-dependent properties.

This explicates the notions of direct reference and object-dependent property, as they will be used in the rest of this paper. The further notion to be clarified in my argument that direct reference and supervenience cannot both be true is the notion of supervenience.

II. SUPERVENIENCE

II.1. The Idea of Supervenience. More has to be said about the supervenience, and in particular the supervenience of the nonphysical on the physical. To understand it better we have to look at how it is motivated. This is often done with the following (undoubtedly physically naive, but nonetheless very powerful) consideration: the world contains exclusively objects that are built up from smallest parts or particles. These smallest particles have certain basic properties and relations to each other. In a sense, that is all there is. Once it is fixed what smallest particles there are and what their basic properties and relations are then, in a sense, everything is fixed. Not every property of smallest particles is basic, though. That a certain particle is within a mile of a chair is one of its properties, but it is not a basic one. The basic properties and relations are only the ones that are both relevant for the behavior of the particle over time, and also jointly sufficient for that particle to have that behavior (in fixed circumstances). Physics is supposed to tell us what these basic properties and relations are and how they determine the behavior of objects that consist exclusively of these smallest particles. These basic properties and relations are thus physical properties and relations. And this gives rise to the thought that the physical fixes the rest. In a world that consists only of these smallest particles and complexes of them, everything is fixed

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[2] One might think that negation and negative properties alone guarantee that some propositions are true, but this will require further argument. I would like to sideline this issue here and rather make the denial of global semantic error explicit.

once it is fixed what kinds of particles there are and what their basic properties and relations are. In such a world only these can really make a difference. To use a helpful analogy, after God created the physical objects and determined their basic properties and relations to each other, there was nothing else to do. So, once the physical is fixed everything is fixed. The physical determines the rest. Or in other words, the nonphysical supervenes on the physical.

This is a motivation for supervenience, but it is not an account of supervenience yet. Supervenience of the nonphysical on the physical is the claim that the physical determines the nonphysical. How "determination" should be understood here still has to be accounted for. To spell this out more precisely is the job of a supervenience principle. Such a principle is supposed to provide at least a necessary condition for determination, and would ideally also give us a sufficient condition. A variety of supervenience principles have been discussed in the literature, and their relationship has been closely investigated. I will only repeat as much of this discussion as is necessary for the main point of the present paper.

One trivially sufficient condition for determination is reduction. There are different notions of reduction, but it will not be necessary to look at the details of different conceptions of reduction here. In the easiest case, nonphysical properties can be reduced to physical properties in the sense that nonphysical properties of physical objects (smallest particles or complexes thereof) are just complex physical properties. If the nonphysical can be reduced to the physical in this sense then trivially the physical determines the nonphysical. But one of the main motivations for the close study of supervenience is the possibility of a version of nonreductive physicalism. Reduction surely is sufficient for determination, but it might not be necessary. The key to defending a nonreductive form of physicalism is to spell out and defend a supervenience principle that is consistent with the falsity of reductionism.

Several such principles have been proposed, the most prominent of which are *global supervenience* (GS) and *strong supervenience* (SS):

(GS) If two possible worlds are physically indistinguishable then they are nonphysically indistinguishable.

(SS) Necessarily, for every nonphysical property N that a physical object O has, there is a physical property P that O has, such that: necessarily, if something has P then it has N.

It was originally argued by Jaegwon Kim that they are equivalent, but that was a mistake. If we are very generous in what conditions proper-

ties are closed under, then (SS) implies (GS), but not the other way round.[3] However, (SS) is equivalent to[4]

> (SS$_2$) For any two possible objects, if they have the same physical properties then they have the same nonphysical properties.

With most of the supervenience principles formulated in terms of properties, the formulation of them implicitly relies on certain conceptions of properties, at least on what properties there are. For example, believers in *property elitism*, the view that there are only view and special properties, and that properties are not closed under many operations that predicates are closed under, like conjunction, disjunction, and negation, will have to formulate supervenience differently, either by not taking recourse to properties at all, or by taking recourse to sets of properties.[5]

These supervenience principles have faced several objections challenging that they will be able to play a core role in a defense of a form of non-reductive physicalism. First, it has been argued that these principles are too strong since they imply reductionism. For example, Kim has argued that (SS) implies reductionism.[6] This argument has been widely criticized, in particular for its relying on very strong closure conditions on properties. This discussion has created a large literature, but since my main argument is independent of this debate I will not pursue it further here.

Second, (SS) has been accused of being too strong, unless the notion of necessity involved in it is understood as being less strong than metaphysical necessity. After all, if the laws of physics are contingent, or if what the physical properties are differs from one world to the next, then we cannot expect (SS) to hold with "necessity" being understood as metaphysical necessity, but we have to understand it as nomological, or physical necessity. This issue is also important and interesting, but it is again of no importance for this discussion. We can take any notion of necessity for what is to come, in fact, we could even leave the first "necessarily" out in (SS) in the discussion below.

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[3] See Jaegwon Kim, "Concepts of Supervenience," and "'Strong' and 'Global' Supervenience Revisited," in *Supervenience and Mind* (New York: Cambridge, 1993), pp. ???–?? and 79–91; see also Bradford Petrie, "Global Supervenience and Reduction," *Philosophy and Phenomenological Research*, xlviii (1987): 119–30; 1987.

[4] See Kim, "'Strong' and 'Global' Supervenience Revisited." This, again, assumes generous closure conditions on properties.

[5] A well-known sparse theory of properties is David Armstrong's, for example in *Universals: An Opinionated Introduction* (Boulder, CO: Westview, 1989).

[6] See Kim, "Concepts of Supervenience."

In the following any notion of necessity will do, and so I will not pursue this further.

Third, it has been argued that these principles are too weak, since even though their truth is necessary for the determination of the nonphysical by the physical, they are not sufficient for such a determination.[7] This is usually supported with the following consideration. The above principles only claim that physically indistinguishable objects or worlds are nonphysically indistinguishable. It is consistent with this that physically very similar but distinguishable objects or worlds have completely different nonphysical properties. For example, it is consistent with these principles that in a world just like ours, except that there is one more pebble on a far away planet, the nonphysical properties of physical objects are completely different than they are in our world. The above principles only require that physically indistinguishable objects or worlds are indistinguishable with respect to their nonphysical properties. But all physical objects in the extra-pebble-world are physically distinguishable from the corresponding objects in our world, and the world as a whole is physically distinguishable from our world. They, for example, have the property of being one million miles from a planet with 1001 pebbles, rather than the property of being one million miles from a planet with 1000 pebbles. It is consistent with (GS), (SS), and (SS$_2$), that the nonphysical properties of the corresponding objects are completely different.[8] It has thus been claimed that such principles need to be strengthened in some way or other to be closer to capturing determination. The above principles might be necessary for determination of the nonphysical by the physical, but they are not even close to being sufficient. In fact, I have heard them being accused of being basically vacuous.

Several attempts have been made in the literature to strengthen supervenience so that it can more plausibly be taken to capture determination. One was proposed by Kim.[9] He proposed to not only connect physical indistinguishability with nonphysical indistinguishability, but also physical similarity with nonphysical similarity. Whether this is satisfactory is quite controversial, however, since it is not at all

[7] See, for example, Terence Horgan, "Supervenience and Microphysics," *Pacific Philosophical Quarterly*, LXIII (1982): 29–43; Kim, "Concepts of Supervenience," and "'Strong' and 'Global' Supervenience Revisited."

[8] See Kim, "The Myth of Non-reductive Materialism," in *Supervenience and Mind*, pp. 265–84, pp. 277ff. The argument has been criticized by R. Cranston Paull and Theodore Sider in "In Defense of Global Supervenience," *Philosophy and Phenomenological Research*, XLII (1992): 833–54; and Robert Stalnaker in "Varieties of Supervenience," *Philosophical Perspectives*, X (1996): 221– 41.

[9] In "'Strong' and 'Global' Supervenience Revisited."

clear that an account of determination has to rule out that small physical changes cannot lead to large nonphysical changes.

Another attempt to get closer to determination is by taking recourse to locality. Intuitively, not everything in the universe is relevant for, say, my chair's being a chair. What matters for that is only what is going on inside a small region of the universe. This could be made more precise in a supervenience principle that takes recourse to what I will call an *unconditional locality requirement*. This is a requirement that only a limited region of the universe alone has to determine some physical object's having a nonphysical property. To turn this into a supervenience principle one could modify global supervenience and claim that if two regions (within a world, or across worlds) are physically indistinguishable then they have to be nonphysically indistinguishable. Global supervenience would be a limit of this, where the regions are complete worlds.[10]

But this gives rise to at least two problems. First, what is it for a region to be indistinguishable from another? Can we not take recourse to relational properties of these regions, and thus do we not collapse such supervenience principles into global supervenience? Second, why should we think that such a principle is true, assuming it can be formulated in such a way that it does not collapse into global supervenience? After all, why should it be guaranteed that physically indistinguishable regions are indistinguishable, in an interesting sense of the notion, in all nonphysical respects? Are not the heads of Oscar and his twin physically indistinguishable (as always, we ignore the fact that brains contain water), but one believes that water is wet, while the other believes XYZ is wet? Locality understood as unconditional locality thus will not help us.

II.2. Conditional Locality and Supervenience. To require for an account of determination that regional physical indistinguishability brings with it nonphysical indistinguishability is too strong. But a weaker form of local dependence can be required for determination. Intuitively we can motivate it as follows. Take my chair's having the property of being a chair. And take some region of the universe, say, the solar system we are in. It is not a requirement of the notion of determination that my chair's being a chair is determined by the physical features of the solar system alone. It is conceivable that the whole physical

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[10] Locality considerations as strengthenings of supervenience principles were proposed by Horgan in "Supervenience and Microphysics," and "Form Supervenience to Superdupervenience: Meeting the Demands of a Material World," *Mind*, CII (1993): 555–86. His "regional supervenience" is more properly understood as a conditional locality principle, as explained below.

universe is needed to determine that my chair has the property of being a chair. But if my chairs being a chair only depends on what is going on inside the solar system then the whole physical universe cannot be required for the determination of my chair's being a chair. If my chair's being a chair only depends on what is going on inside the solar system then the physical properties of my chair that are such that my chair's having them also only depends on what is going on inside the solar system alone have to be sufficient to determine that my chair has the property of being a chair. To put it more simply, if my chair's being a chair only depends on what is going on inside the solar system then only its physical properties that themselves only depend on what is going on inside the solar system have to determine that it is a chair. (I will introduce some terminology momentarily that will allow me to put it much more simply.) Thus we do not require there to be unconditional local dependence. It is not claimed that my chair's being a chair only depends on what is going on inside the solar system. Rather, the claim is that *if* my chairs being a chair only depends on what is going on inside the solar system, then the physical properties that likewise only depend on what is going on inside the solar system have to determine it.

I will try to formulate this idea more precisely in this section and will refine it further in later sections. Harmless as it sounds, it will be central in the main argument of this paper.

To have a supervenience principle that captures this conditional local dependence I will introduce the notion of a local property. With it we can then refine (SS). For simplicity, let us take some region that is large enough, but still less than all of the universe, like our solar system. We can say that a property is local (relative to the solar system) just in case something inside the solar system has it, and that thing would still have it as long as everything inside the solar system remains the same. More precisely:

(5) A property, physical or nonphysical, is *local* iff a physical object inside the solar system has that property and that object would still have this property even if the universe outside the solar system were different, but the same inside the solar system (over time).[11]

Now, if the physical determines the nonphysical, and if there is a local nonphysical property that a physical object inside the solar system has, then the *local* physical properties of that object have to determine that nonphysical property. Since, after all, how could the physical

[11] This explication of being a local property will be expanded on below.

determine the nonphysical, a physical object's having a certain non-physical property only depend on what's going on inside the solar system, but the physical properties that determine the physical object's having that nonphysical property not be local?

We can simply modify (SS) to accommodate this idea. The resulting principle could be called *Local-Local Supervenience*.[12]

> (LLS) Necessarily, for every local nonphysical property *N* that a physical object *O* (inside the solar system) has, there is a local physical property *P* that *O* has, such that: necessarily, if something has *P* then it has *N*.

(LLS) is on the right track when it comes to getting closer to capturing determination with a supervenience principle. Of course, (LLS) is not the strongest principle that could be motivated. It is restricted to one region, the solar system, which could easily be strengthened in the same spirit.[13] But (LLS) is better than (SS) and (GS). It makes explicit something that cannot be denied if one believes in determination of the nonphysical by the physical.

If the nonphysical is determined by or supervenes on the physical then (LLS) will have to be true. This is not to endorse unconditional locality, just conditional locality. Only local properties have to supervene on local properties, not necessarily all properties.

But here is the rub: (LLS) cannot be true if direct reference is true. If direct reference is true then there are object-dependent properties and physical objects have them. But if physical objects have object-dependent properties then (LLS) fails. Thus if direct reference is true then supervenience cannot be true.

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[12] Horgan's regional supervenience is a related supervenience principle. See his "Supervenience and Microphysics," and "Form Supervenience to Superduperven-ience: Meeting the Demands of a Material World." It should also be noted that (LLS) only applies to local properties, and does not imply (SS) in general, and thus is not a substitute for (SS), only an augmentation. Since local properties are the primary concern here I will work with this formulation. Of course, in the general setting (SS) is still assumed for nonlocal properties.

[13] An obvious strengthening that is in the spirit of how (LLS) was motivated is as follows: first define being a local property with respect to a space-time region *R*:

> (6) A property is *R*-local just on case something in *R* has it and that thing would still have it even if the universe outside of *R* were different, but the same inside of *R* (over the duration of *R*).

Then define a stronger version of local-local supervenience:

> (SLLS) Necessarily, for every region *R* and for every nonphysical *R*-local property *N* that a physical object *O* inside *R* has, there is a *R*-local physical property *P* that *O* has, such that: necessarily, if something has *P* then it has *N*.

III. THE ARGUMENT

First we have to have a look at which properties are local. We can do so by considering a certain conditional, the one that defines being a local property. This makes it easy to see that the property of being a chair is local. My chair has it and it would still have it as long as the world inside the solar system would be the same, even if it would be different outside of it. The property of observing a certain faraway star is not local, though, even if something inside the solar system has it. If we leave everything inside the solar system untouched but take away that faraway star then whatever had the property of observing that star before would no longer have it.

Now consider an object-dependent property, like the property of being Clinton. This property, as an object-dependent property, is simply the property of being identical to a particular object. Since Clinton is in the solar system, and since he has the property of being identical to Clinton, we have to ask ourselves: Would this object still have this property if we changed the world outside of the solar system, as long as we leave everything the same inside of it? Since the property of being Clinton is merely the property of being identical with a certain object, changing around which objects there are outside of the solar system and which properties they have has no effect on which objects there are inside the solar system. Clinton would still be there and he would still have the property of being identical to Clinton. This might seem trivial, and it is. But it is only trivial if we assume that the property of being Clinton is an object-dependent property. If it were the property of being the F, for some purely general F, as certain descriptive theories would hold, then this is not trivial any more, and is in fact false. If the property of being Clinton is the property of being the F then we could change the world outside around in such a way that outside of the solar system we added another F. Thus Clinton would not be the (one and only) F any more. But under the assumption that the property of being Clinton is an object-dependent property it indeed follows trivially that it is a local property. Even if we add more objects outside of the solar system, or take some objects away, or change some of their properties, Clinton remains untouched, and is still identical to the very same object, Clinton. Object-dependent properties trivially have this feature, but not all properties do. The same considerations carry over to properties like being Clinton's mother and a wide range of other object-dependent properties.

But now look at Local-Local Supervenience again which was established above to be at least a necessary condition for the supervenience

of the nonphysical on the physical. Since Clinton is a local physical object and being Clinton is a local physical property there thus has to be a local physical property that is such that: necessarily, if something has this physical property then it has the property of being Clinton. Let us call this physical property P_c. I will argue that there is no such physical property.

The property of being Clinton is a special property because it is not possible that more than one thing has it. Clinton might not exist in some possible worlds, but if there is something that is Clinton in some world then there is at most one such thing in that world. Let us call a property that at most one thing can have in each possible world a *uniqueness property*. Note now that the physical property P_c whose existence is claimed by (LLS) has to be a uniqueness property, too. If not then it is possible that two things in one world have P_c. But since it is necessarily so that if something has P_c then it has the property of being Clinton, in such a possible world these two things would be Clinton, which is impossible, since being Clinton is a uniqueness property. P_c thus has to be both a local property and a uniqueness property. However, no physical property is both a local property and a uniqueness property. Here is why.

There are basically two ways in which a property can be a uniqueness property:

- It could be a property that has uniqueness built in logically, so to speak, like the property of being the (one and only) F. These properties would be expressed by predicates containing definite descriptions, or other devices involving quantification and identity. I will call them *logical uniqueness properties*.
- Or it could be an object-dependent property, like the property of being Clinton.

However, no local physical property is either one of these.

It is easy to see that no local physical property P can be a logical uniqueness property. Assume that P is the property of being the (one and only) F. Since P is local, an object O that is the F would still be the F even if the universe outside the solar system were different. But, of course, if there were another F outside the solar system then O would not be the (one and only) F any more. Unless being F is itself a uniqueness property (in which case we run the same argument with being F) it will be possible that there is another thing that is F but the solar system remains the same.

In addition, no physical property is object dependent. To see this we have to look a little bit more closely at which properties are the physical properties. Not all properties of physical objects are physical

properties. The whole point of the discussion of supervenience and determination is to see whether all of the properties of physical objects are determined by a special select class of properties of these objects. To see which properties are the physical ones we have to look back at what motivated the idea of physicalism, the idea that the physical determines the rest. The idea, again simply put, was that all physical objects are made up from smallest stuff, and this smallest stuff has basic properties and relations which together are sufficient to determine its behavior. In addition, the properties that count as physical are only the ones that are necessary in the determination of the behavior of the smallest stuff. If one class of properties is sufficient to determine the behavior then any class that contains it will be sufficient as well, but this larger class will contain nonphysical properties. The physical properties are thus the smallest class of properties that are sufficient to determine the behavior of the smallest stuff. The idea of physicalism is that since everything is built up from this smallest stuff these properties are sufficient to determine the rest. Thus the question whether or not some physical properties are object-dependent properties is not whether or not some physical objects have object-dependent properties, but whether or not these properties are part of the smallest class of properties that are jointly sufficient to determine the behavior of the stuff that all physical objects are made of. And it is here that the strangeness and irrelevance of object-dependent properties becomes apparent at the physical level. Even if the smallest stuff has object-dependent properties, these properties are completely irrelevant for their behavior.

Take a simple example, like a particular electron, call it Elly. Elly has a number of general properties which are not object dependent. It has a charge, mass, speed, and so on.[14] These are all properties that are relevant for its behavior. The property of having a certain charge will affect its behavior in one way, and the property of having a certain mass will affect it in another. But the property of being Elly has nothing to do with its behavior. It will behave exactly like any other electron that has the same mass, charge, and so on. Only the general properties matter for how it will interact with other particles, not which particular electron it is.

Or so things seem to be in our world. In our world only the general properties matter, not which particular particle among several other-

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[14] Again, I simplify. What if physics has no room for local properties, and what if there are no objects or particulars at the level of smallest things? As we will see below, the worse for the supervenience of the nonphysical on the physical.

wise indistinguishable particles we are dealing with. The physical laws of our world do not care about the individual in that sense. All that is physically relevant are the general properties of the individual, not which individual it is. It is left an open question so far whether this has to be so. Could God make the world in such a way that being Elly matters for Elly's behavior and its interaction with other matter? Maybe God could, but he would make a strange world in doing this. In this world there would be an object such that being that object, and not any other with the same general properties, matters for the interaction of this object with others. This is more than merely a world where there is a physically special object, one that has a special status among all objects there are and which exhibits special behavior. It would be a world where this object is special *because* it is that object, and not because it alone has a certain special combination of general properties. But maybe God cannot make such a world. Maybe there are some general truths about laws, or causation, or the like, that require that only the general properties matter. I want to leave this question open in this paper, since all that is required for my argument is that in a world that is physically like ours the physical properties are not object-dependent properties. Our world is such that only the purely general properties matter for how individuals interact with others at the physical level. Only general properties are physically relevant, and thus are physical properties. Thus even if physical object have object-dependent properties, these properties are not among the physical properties of these objects.

   The claim that object-dependent properties in fact are not physically relevant, and thus not physical properties, even if physical objects have them, is ultimately an empirical claim. It might be necessarily so, but here I only maintain that it in fact is so. Whether or not it is necessarily so has to be settled in a debate about laws of nature, or causation, or a similar debate. Whether it is in fact so has to be settled scientifically. Whether it is necessarily so can be doubted, whether it is in fact so has to my knowledge never seriously been doubted, but still, we cannot claim to have proven it. To be very strict I should claim only to have argued for a conditional claim, a conditional whose antecedent is universally believed to be true, but an empirical claim that was not established in this paper. The conditional simply is that if object-dependent properties do not matter physically then object-dependent properties do not supervene on physical properties. But since the antecedent is never doubted I can risk the more ambitious claim that object-dependent properties do not supervene on physical properties. Since direct reference guarantees that physical objects

have object-dependent properties we can conclude the direct reference and supervenience are incompatible.[15]

<div style="text-align:center">IV. REMARKS ON THE ARGUMENT</div>

I would like to clarify several aspects of the above argument in this section.

(1) The main argument was given for the failure of the supervenience of the nonphysical on the physical, given that there are object-dependent properties. But it clearly generalizes for any kind of supervenience where the supervening properties contain object-dependent ones, but the subvenient properties do not. The physical and nonphysical are one case of this. A similar argument can be given for versions of materialism that are more permissive than physicalism, as long as this asymmetry is maintained. Other supervenience claims are untouched by all this, like the supervenience of the moral on the nonmoral, since both classes of properties arguably contain object-dependent properties.

(2) The role of direct reference in the argument is to show that there are local uniqueness properties, and that some things have such properties. Using direct reference we can show that the property of being Clinton passes the test for being a local property, and thus for being a local uniqueness property. It would not pass this test if certain descriptivist views were right. According to such descriptivist views the property of being Clinton is just the property of being the *F* (for some *F*). This property is not a local property, as we saw above. Direct reference and object-dependent properties thus do play an essential role in the argument, however, their role is limited in the sense indicated. We could eliminate talk about them by directly assuming that the property of being Clinton or related properties are local properties. But as said at the very beginning, this assumption will seem ad hoc and suspicious. Direct reference implies it, and since it is a widely held view it was used as an explicit premise.

(3) It has been doubted that a metaphysical thesis like the supervenience of the nonphysical on the physical could possibly be in conflict with a semantic thesis like direct reference.[16] After all, how can a thesis about language have any large scale implications about the basic make-up of reality? True enough, semantics all by itself is only about languages, but semantics plus the fact that certain utterances

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[15] I am indebted to an anonymous referee for suggesting substantial improvements to this part of the paper.

[16] For example, in Robert Adams, "Primitive Thisness and Primitive Identity," this JOURNAL, LXXVI, 1 (January 1979): 5–26.

are true can have such implications. For example, given that the predicate 'is Clinton's mother' truly applies to a certain person, certain semantic facts about that predicate can have metaphysical implications. In this case, the semantic fact of direct reference would have the implication that a certain person has an object-dependent property; and similarly for sentences or utterances. If 'Clinton is tall' is true, or is truly uttered, then semantic facts about the term 'Clinton' can have metaphysical implications, implications that the semantic facts without the extra claim about truth would not have. Thus semantics and the truth of ascriptions of predicates can have the consequence that some things have object-dependent properties. If such properties cannot supervene on physical properties (as was argued above) then further metaphysical consequences follow.

This was also preemptively addressed above by assuming a denial of a global semantic error thesis. It was assumed to be part of the theory of direct reference that some propositions expressed by sentences containing directly referring terms are true, and some predicates containing directly referring terms truly apply to some objects. This is something that no believer in direct reference has ever doubted (to my knowledge), but it has to be made explicit to address the present worry.

(4) A further angle from which the above argument could be attacked is from worries about the existence of properties. It could be argued that I assumed without justification that there is a property of being Clinton, or of being Clinton's mother, or at least that direct reference implies this. However, this is a controversial assumption, one that a nominalist about properties might deny. Thus the argument relies on controversial assumptions.

It is true that I freely made use of talk about properties in this argument, and that this might seem to be in conflict with nominalism and other controversial positions. However, this is standardly done in the discussion of supervenience. If one finds talk about properties objectionable then one will either have to give up on supervenience altogether or give it a different formulation. The latter could be done in terms of facts, propositions, predicates, or others. Whichever one will choose, the above argument will go through, mutatis mutandis. The same argument will show that there is a proposition that cannot supervene on any physical proposition, or that there is a fact that cannot supervene on any physical facts, and so on. The formulation of the above argument used talk about properties, but the argument does not depend on it. It can be restated for whatever formulation of supervenience one accepts as long as it is understood that one kind of thing (properties, facts, and the like) supervenes on the same

kind. I will discuss an attempt to avoid the conclusion of the argument by giving this up below.

(5) The above account of a local property should not be understood as a definition of a local property in other terms, but only as an explication of this notion. As a definition it would be unsatisfactory. A property was called local just in case something (in the solar system) has it, and that thing would still have it as long as everything in the solar system remained the same, even if there are changes outside of the solar system. But what does it mean for everything inside the solar system to remain the same? Surely if there is some change outside the solar system then everything inside the solar system will undergo some change. Everything will have different relational properties to the things outside of the solar system. One might think that how "everything inside the solar system remains the same" should be understood is that there are the same objects and that even though they might have different relational properties, they all have the same *local* properties. But now, of course, this would be circular.

This situation is analogous to the one we are in when we try to understand the notion of an intrinsic property more precisely. Intuitively this notion is clear enough, and it can be explicated by saying that an intrinsic property is one that a thing can have no matter what properties other things have. But that is not quite right since other things can have relational properties that rule out that a thing has a certain intrinsic property. More precisely, an intrinsic property is a property that something can have no matter what *intrinsic* properties other things have. But that, again, is circular as a definition. The situation about local properties is analogous to the one about intrinsic properties, but it is no worse. Being a local property can be defined in terms of being an intrinsic property. The crucial clause "the universe within the solar system remains the same" can be understood as "the universe contains the same objects within the solar system, and they have the same *intrinsic* properties." This is sufficient for our present concern.[17] If the distinction between intrinsic and extrinsic properties turns out to be indefensible then the difference between a local and a nonlocal property will likely have to go as well, together with a good chunk of contemporary metaphysics. In this case, local duplication, which is used in my main argument, will collapse into global duplication, and the assumption implicit in the main argument that a part

[17] For more on attempts to give definitions of "intrinsic property" see Stephen Yablo, "Intrinsicness," *Philosophical Topics*, XXVI (1998): 479–504; or Rae Langton and David Lewis, "Defining 'Intrinsic'," *Philosophy and Phenomenological Research*, LVIII (1998): 333–45.

of the world could stay the same while another part changes will turn out to be false. But the distinction between intrinsic and extrinsic properties, although hard to define precisely, seems so intuitive that it is hard to believe it is not onto something.

(6) Talk about local properties might seem suspicious, in particular in the context of physicalism and physical properties. After all, has recent physics not taught us that locality cannot be assumed and that there is nonlocal physical interaction? Locality as it is used in the above discussion is not incompatible with nonlocality in physics. It only states that if there is a local nonphysical property then there has to be a local physical property which determines it. It is compatible with this that there is action at a distance or superposition, or the like. If physics, however, tells us that there are no local physical properties, then the worse for the supervenience of the nonphysical on the physical, assuming that there are object-dependent properties. Such supervenience will then fail trivially. And if physics tells us that at the smallest level there are no objects or individuals then again the worse for the supervenience of the nonphysical on the physical. Thus to talk about individual physical particles in the above argument is a concession to the physicalist, not an illegitimate assumption.

V. SYMMETRY, *THISNESS*, AND THE IDENTITY OF INDISCERNIBLES

Our discussion so far was concerned with how object-dependent properties fit into a physical world, and in particular if they can be determined by physical properties. We saw that such properties are not determined by physical properties, and in fact by any properties that are not themselves local uniqueness properties. We will look at what consequences we should draw from this in just a minute. Presently I would like to focus on how this debate relates to a different but closely related debate. This debate is one that does not directly involve object-dependent properties, but properties like the property of being Clinton, whether or not they are object dependent. A property that is the property of being identical to a particular individual, like the property of being Clinton, is called a *thisness* or *haecceitas*. It is widely discussed how such properties relate to purely general or qualitative properties. Some philosophers, most notably Leibniz, believed that every *thisness* can be analyzed in terms of purely qualitative properties. Others have argued that such an analysis is impossible.[18] The main argument for this impossibility is one using complete symmetry. In a completely

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[18] See Adams, "Primitive Thisness and Primitive Identity," for a variety of historical references on these debates.

symmetric world mirror images will share their purely general proper-
ties, but not their *thisnesses*. However, this argument is more problem-
atic than it might at first seem. Those who believe that an analysis of
a *thisness* in terms of purely qualitative properties is possible will also
believe in the identity of indiscernibles, the principle that if *x* and *y*
have the same purely qualitative properties then they are identical.
After all, if an analysis of a thisness is possible in terms of purely
qualitative properties then having the same purely qualitative proper-
ties is sufficient for identity. Complete symmetry is impossible for
believers in the identity of indiscernibles. The question then becomes
whether or not it is legitimate to use complete symmetry to give an
argument against the identity of indiscernibles and the analysis of
thisness in terms of purely qualitative properties without begging the
question against the believer in these principles.[19] Ian Hacking, for
example, has argued that every nonquestion-begging description of
a world that is an alleged counterexample to the identity of indiscern-
ibles can be reinterpreted by a believer in the principle using non-
Euclidean geometry in such a way that it is consistent with this princi-
ple.[20] Whether or not complete symmetry can be used to argue against
the identity of indiscernibles and the analysis of *thisnesses* in terms of
purely qualitative properties remains controversial.

   The main argument in this paper does not assume a premise from
this debate. It never relied on complete symmetry nor the falsity of
the identity of indiscernibles. The argument goes through whether
these principles are true or false. All that was necessary for the above
argument to work is that local duplication is possible. This can be so
even if the two local duplicates are distinguishable by their nonlocal
purely qualitative relational properties. Thus local duplication is com-
patible with the identity of indiscernibles and with the impossibility
of complete symmetry. In addition, the argument given above does
not rely on believing in complete symmetry, and thus is stronger than
arguments that use complete symmetry to argue for the failure of
supervenience of properties about particular individuals.

   My main argument does have implications for this debate, however.
It shows that an analysis of a *thisness* in terms of purely qualitative
properties is impossible, without relying on complete symmetry, but given
two other assumptions. We should look at this last point more closely.

   The question whether or not a *thisness* can be analyzed in terms of

[19] See Max Black, "The Identity of Indiscernibles," *Mind*, LXI (1952): 153–64; Ian
Hacking, "The Identity of Indiscernibles," this JOURNAL, LXXII, 9 (May 8, 1975):
249–56; and Adams, "Primitive Thisness and Primitive Identity."
   [20] See Hacking, "The Identity of Indiscernibles," for the argument.

purely qualitative properties is a real question whether or not one believes that these properties are object-dependent properties. If one believes that the property of being Clinton is identical to the property of being the *F*, for some *F* which is not object dependent, then the question remains if the property of being the *F* can be analyzed in purely qualitative terms. On the other hand, if one believes that the property of being Clinton is object dependent[21] then again there remains the issue if it nonetheless can be analyzed in terms of purely qualitative properties. For us to understand this better I will have to say more on what it is to analyze a property in terms of purely qualitative properties. One obvious way to explicate this is to claim that there has to be property identity. Being Clinton is analyzable in terms of purely qualitative properties if it is identical with a purely qualitative property. A weaker requirement is determination. The properties can be different, but one has to determine the other.

The above argument can be used to argue that a *thisness* is not analyzable in terms of purely qualitative properties if we make the following two assumptions:

(1) An analysis of property *P* as property *Q* at least requires that *Q* determines *P*
(2) A *thisness* is a local property

Assumption 1 is a rather weak requirement for analysis. Assumption 2 is guaranteed, as was argued above, if a *thisness* is an object-dependent property. But in effect this assumption is weaker than to assume that a *thisness* is object dependent since there might be properties that are not object dependent, but still local. All that was required for the above main argument to get off the ground was that there are local uniqueness properties. The thesis of direct reference was taken to imply that there are object-dependent properties of physical objects, and it was argued that object-dependent properties can be local uniqueness properties. Only the last of these was then used in the argument. If a *thisness* is a local property then our argument gets going, whether or not it is object dependent. I take it to be trivial that a *thisness* is a uniqueness property.

So, given these two assumptions we can argue that a *thisness* cannot be analyzed in terms of purely qualitative properties without relying

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[21] I ignore here the issue of the property being object dependent with respect to its existence, which one might take to give one a cheap route against an analysis in purely qualitative terms, since purely qualitative properties do not depend for their existence on the existence of any particular objects (according to many conceptions of properties). Dependence for identity is really what matters in this discussion.

on the falsity of the identity of indiscernibles or on complete symmetry. Using the main argument above this is now quite straightforward: by assumption 1, if an analysis of a *thisness* in terms of purely qualitative properties is possible then these purely qualitative properties have to at least determine the *thisness*. By assumption 2 a *thisness* is a local property, and thus a local uniqueness property. But by the main argument above, without relying on complete symmetry or on the falsity of the identity of indiscernibles, we have seen that no purely qualitative properties can determine a local uniqueness property. Thus an analysis of a *thisness* in terms of purely qualitative properties is impossible.[22]

   We do not need to rely on complete symmetry in this argument. We at most need local duplication of the solar system. A local duplicate of the solar system is a collection of objects that satisfy the same purely general *local* properties that the corresponding objects satisfy in our solar system. We do not have to reject the principle of the identity of indiscernibles, but we have to reject the principle of the identity of local indiscernibles, the principle that no two objects can have the same purely qualitative local properties. This latter principle is, of course, not one that has any appeal, but it can be rejected while the principle of the identity of indiscernibles is maintained. Local duplication does not require complete symmetry. Two objects can have the same purely general local properties while differing in their purely general nonlocal properties. One of them might be a million miles from one pebble, while the other one is a million miles from two. Thus the argument given in this paper against an analysis of a *thisness* in terms of purely general properties relies on weaker assumptions than the traditional arguments using complete symmetry.

VI. A WAY OUT?

The above argument shows that supervenience and direct reference cannot both be true. It cannot be that some physical objects have object-dependent properties and that all of the properties of a physical object are determined by its physical properties. This is somewhat unsettling. The supervenience of the nonphysical on the physical is usually seen to be a minimal requirement for the truth of physicalism. And direct reference is a well-motivated, though, of course, just as physicalism nonetheless controversial, view in the philosophy of language. It will not be easy to give either one of them up. Of course,

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one can stick with both of them and simply reject the argument given above for some reason or other. But in these final pages we should consider whether there are other options besides these. Can we accept the argument given above, and hold onto supervenience as well as direct reference? In this section we will look more closely at one option to do this. In the concluding section I will suggest another, more radical, one.

We will have to have a look again at how supervenience was understood. One of the special features of the above discussion of supervenience was taking recourse to conditional locality, which is not part of standard formulations, but I think it is a legitimate requirement for an account of determination to include a local-local relationship as (LLS). I do not want to question this now. Another thing, however, which is part of standard formulations, and which was also assumed above, is that supervenience is a relationship between two sets of the same kinds of entities. I assumed that properties supervene on properties, or facts on facts, or propositions on propositions. One strategy to get around the main argument is to give up this assumption. This strategy takes the lesson of the main argument to be that it cannot be that properties, facts, and the like, are determined by the physical members of their own kind. Thus according to this strategy we at least will have to reject what one might call *kind-kind* supervenience, the supervenience of one kind of things (properties, facts, propositions) on the same kind, as long as the subvenient kind does not contain object dependence, but the supervening kind does. But maybe this is exactly how the formulation of supervenience has to be modified to make the supervenience of the nonphysical on the physical compatible with object-dependent properties after all. Maybe the argument above relied on a too specific formulation of supervenience, and maybe this can be gotten around by giving a different formulation. I will pursue this line of thought in this section.

Object-dependent properties fail to supervene on physical properties, but in a sense they do not fail to do so by much. They almost supervene on the physical properties. Take an object-dependent property which is a local uniqueness property, like being Clinton, or being Clinton's mother. It is closely related to a nonobject-dependent relation and an object that relation is had to. Thus being Clinton's mother is closely related to the being-the-mother-of relation, and Clinton. And having the mother-relation to Clinton is closely related to having the property of being the mother of Clinton. Now, we saw that the property of being Clinton's mother, as a local uniqueness property, does not supervene on any physical property. But the relation of being-the-mother-of is not an object-dependent relation. We can grant

that it supervenes on a physical relation. In addition, we can grant that Clinton is a physical object. Thus even though being Clinton's mother does not supervene on any physical property, the relation of being-the-mother-of does supervene on a physical relation, and the object the relation is had to is a physical object.

We cannot have supervenience of properties on properties, but it seems that we can have something closely related to it. An object will have the property of being Clinton's mother as long as it has the mother-of relation to Clinton. Clinton is made up from only physical stuff and is thus a physical object. In addition, there is a physical relation on which the mother-of relation supervenes on, and the object the relation is had to is a physical object, namely Clinton. So, there is a physical relation and a physical object (Clinton) such that necessarily, if something has that relation to that object then it has the property of being Clinton's mother. So, if an physical object has an object-dependent property then its having that property will be necessitated by its having a certain (nonobject-dependent) relation to another physical object (or possibly itself, as in the case of Clinton's having the property of being Clinton). If the property depends on more than one object then we need a more than binary relation and more than one physical object as relatum to do this. More generally we can formulate the following modified supervenience principle, modified strong supervenience:

> (MSS)   Necessarily, for every nonphysical property N there is some n and an n-ary physical relation R^n, and a sequence of physical objects $\vec{o}$ of length n-1, such that, necessarily, if something has $R^n(\vec{o})$ then it has N.

This is merely a more general version of (SS). The arity of the relation can be 1, in which case the 1-ary physical relation is just a physical property, and the sequence of physical objects $\vec{o}$ will be empty. If N, however, is an object-dependent property which depends on k many objects then R will be an k+1-ary relation.

Before we will have a closer look at whether or not this is an acceptable way to make supervenience compatible with object-dependent properties, let us extend it to accommodate locality. Again, presently 'local' is understood as 'within the solar system'. A property or relation being local is understood just as we did above. An object is local if it is located within the solar system. Then we can formulate modified local-local supervenience as follows:

> (MLLS) Necessarily, for every local nonphysical property N there is some n and an n-ary local physical relation R^n, and a sequence of local physical

objects $\vec{o}$ of length n-1, such that, necessarily, if something has $R^n(\vec{o})$ then it has N.

This can be extended, as above in footnote 13, to cover arbitrary regions of space-time.[23]

It is now not hard to see that the modified version of local-local supervenience has no problem with local object-dependent properties. In the case of being Clinton's mother the local physical relation will be the one on which being-the-mother-of supervenes, and Clinton will be the only local physical object in the sequence of objects. In the case of the property of being Clinton, the local physical relation is identity[24] and the only physical object is, again, Clinton. That these relations are local is not hard to see with the usual test. Thus given this new formulation of supervenience we get no incompatibility between supervenience and object-dependent properties.

A second, in fact equivalent, option is to consider the notion of an objectual closure of the physical properties and relations. If we have an n-ary relation and k many objects then we can build from that (n-k)-ary object-dependent relations, namely the ones that result from putting the k many objects in certain argument places of the n-ary relation. Now, if we have a class P of properties and relations (say, the physical properties and relations) and a class O of objects (say, the physical objects) then the objectual closure of P with O are all the properties and relations that can be built from the members of P by filling argument places with members of O. In the case of the physical properties and relations, and the physical objects, the objectual closure will be the physical properties and relations plus all the object-dependent properties and relations that are such that the nonobject-dependent part consists of purely physical properties and relation, and the only objects these properties and relations depend on are physical objects. Now, we have seen above that the properties in the objectual closure of the physical properties and relations with the physical objects are not themselves physical properties. But the objectual closure of the physical properties and relations with the physical objects is sufficient as a supervenience base for the object-dependent properties (if the nonobject-dependent properties supervene on

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[23] Here is the formulation, stronger modified local-local supervenience:

(SMLLS) Necessarily, for every region R and every R-local nonphysical property N there is some n and an n-ary R-local physical relation Q^n, and a sequence of R-local physical objects $\vec{o}$ of length n-1, such that, necessarily, if something has $Q^n(\vec{o})$ then it has N.

[24] As a logical relation I count this as physical.

physical properties, of course). The objectual closure of the physical properties and relations will consist of object-dependent properties, and all physical objects are allowed. The above argument would be blocked.

This modification of various supervenience principles can avoid the above argument, but it does not help with the main problem. The reason is that these modified supervenience principles cannot be taken recourse to by someone who wants to spell out the determination of the nonphysical by the physical, as required for a defense of a physicalist world view. The modified supervenience principles smuggle object-dependent properties into the supervenience base, which is illegitimate in a defense of physicalism.

Physical properties are somewhat unusual. If we take the physical properties and relations, and form the objectual closure build with only physical objects then we get more than the physical properties. Physical properties are not object dependent. Even object-dependent properties that depend only on physical objects are not physical properties. In particular, the property of having a certain physical relation to a certain physical object is not a physical property. So, even though the relation is physical, and the object is physical, the property of having the relation to the object is not physical. It is important to keep this in mind. Now, we can thus see that taking recourse to the objectual closure of the physical properties and relations with physical objects is not legitimate for a physicalist supervenience base. This would classify object-dependent properties that depend on physical objects as physical properties. Thus a formulation of a modified supervenience principle taking recourse to objectual closure is no help to the physicalist, since the properties in the closure are more than just the physical properties. And the formulation of modified supervenience as in (MSS) or (MLLS) will not help either. Even though these principles do not explicitly mention object-dependent properties as part of the supervenience base, they do rely on them implicitly. The relevant clauses contain such phrases like 'there is some object . . . and some relation . . . such that having that relation to that object. . . .' Here we quantify into the "object-position" of an object-dependent property, and thereby we are implicitly relying on object-dependent properties as the supervenience base. We are merely replacing properties that depend on particular objects with quantification into the object-position of an object-dependent property. And this is equally illegitimate for a physicalist to use as a basis for what determines the rest. The physical has to determine the rest, and since object-dependent properties are not physical they cannot be used to give an account of (physical) determination. Thus the modified superve-

nience principles will not help the physicalist, even though they do get around the main argument from above, since they rely on object-dependent properties in the supervenience base.

VII. CONCLUSION

Even though most of this discussion was about the physical and the nonphysical, a puzzle more generally arises about the relationship between purely qualitative properties and object-dependent properties. If we hold that objects have both purely qualitative properties as well as object-dependent properties, how do they relate to each other? The above argument showed that object-dependent properties cannot be analyzed in terms of purely qualitative properties, if analysis at least brings with it determination, a quite minimal requirement. But on the other hand, it also seems that object-dependent properties are not independent of purely qualitative properties. After all, could it really be that after God specified what kinds of things there are and what purely qualitative properties and relations these things instantiate, he still had many options left open about which objects should exist in such a world? Could God have created a world exactly like ours in all qualitative respects, but with the only difference that the thing which actually is Bush would be Clinton and the other way round? And could God thus create infinitely many worlds that are qualitatively identical and differ only in which object exist in them? It seems not.[25] But how can we maintain all that? How could the object-dependent be real and in addition to the purely qualitative, but also not be determined by it and not be independent of it?

One way out of all this, for better or worse, is as follows. The argument that led us into this situation essentially uses two kinds of modal reasoning. One of them is object centered. Here we fix the objects and consider situations where these objects have different properties. The other is world centered, or purely general. Here we merely consider what properties and relations might be instantiated and co-instantiated. We do not have to talk about any particular objects in doing this. In the main argument above both of these forms of modal reasoning were used. In the definition of being a local property, and the argument that being Clinton is a local property, we engaged in object centered modal reasoning. We imagined what would happen to particular objects if things were different. In the motivation for supervenience, on the other hand, we engaged in

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[25] These worries apply to Adams's *moderate haecceitism* as well—see "Primitive This-ness and Primitive Identity."

world centered modal reasoning. We imagined a world as a whole and wondered about what properties and relations are instantiated in such a world. Now, it might just be that these two forms of modal reasoning are not compatible with each other. This is not to say that one of them has to go. Rather it might be that even though both of these forms of reasoning are fine and important when used by themselves, when both are mixed and pushed to the limit they might just lead us into contradictions. To say this is, of course, not much more than a hint of an outline of how to deal with this situation. To spell this out we would have to look more closely at modal reasoning, what it is good for, why it comes in two kinds, and how they relate to each other. This is a big task, but if this is on the right track then it might just be that there is another way out of our dilemma.

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