

AN ARGUMENT AGAINST THE IDENTITY THEORY

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Abstract

In this paper I outline two kinds of functionalism, role and realizer functionalism, as general accounts of scientific composition. I then argue that realizer functionalism is unable to deliver an appropriate notion of scientific compositional explanation. I argue this point by explaining and diagnosing the distinctive problem with the dormative fallacy and by arguing that realizer functionalism shares this problem. To be more precise, I argue that the kinds of compositional explanations that obtain if realizer functionalism is correct share the same vice as the dormative fallacy. Since we ought to reject explanations that commit the dormative fallacy, we ought also to reject realizer functionalist compositional explanations, and by corollary, realizer functionalism itself. I conclude that these considerations give us a powerful reason to favor role functionalism over realizer functionalism.

I. INTRODUCTION

In this paper I will be considering an argument against realizer functionalism and in favor of role functionalism as a general theory of reduction in the sciences. I will first describe the two views. I will then argue that realizer functionalism cannot offer the kind of mechanistic explanation that we look for in the sciences. I will illustrate this by showing an important similarity it bears to a fallacy in reasoning.

II. THE TWO VIEWS

There are two presuppositions that will be useful for us in understanding these two theories. The first is the causal theory of properties and the second is the distinction between higher and lower order proper-

ties. The causal theory of properties is the view that properties are identical with or individuated by their causal powers.¹ The property of being acidic causes corrosion in metal. We distinguish it from other properties by the distinct features of its effects. We call these affects of a property its causal role. Second, there are higher and lower order properties.² Some property A is of a higher order than some property B iff the substance exemplifying A is made up by that substance which exemplifies B. The property of acidity, for example, is a higher order property than the property of having a certain charge. The former is a property of chemicals, while the latter is a property of particles. But since chemicals are composed of particles, the property of the chemical is the higher order property. There is some sense in which the property of acidity is made up out of those lower order physical properties. What we want to know is what that sense is.

Let us consider first role functionalism. A property is that which contributes causal powers to individuals. Let's say that the specific causal patterns the property brings about when it is instantiated is its m-role. The m-role of a property allows certain individuals to interact in certain specific causal processes. An m-role is a particular function, a causal relation between properties.³ Lower order properties, the properties of physics, also stand in causal relations. Both higher and lower order properties have m-roles. Let's call the relation of a higher order property to a lower order property in a composed entity m-realization. It is a making up relation. The causal roles of the lower order properties m-realize the causal roles of the higher order properties. The causal roles of the physical particles of acids and metals m-realize the causal roles of acidity and corrosion.

The m-role of a higher order property is a function; a pattern of inputs and outputs. It is a specific pattern of causal relations. The property of acidity has as part of its m-role the specific pattern of causing corrosion when coming into contact with metal. As we will see, there is controversy between the realizer and role functionalist about whether or not the patterns of these m-roles can be generalized. That is, over whether any characterization of properties must take into account the topic specific aspects of these patterns. If one takes to heart the notion of an m-role as a kind of pattern, it will become apparent that there can be no necessity to the way in which it is realized. Consider the pattern of the symbols of English that I now use to write. That pattern could be realized on paper, or in stone, or on a computer screen as it is now. It is generally

held that two things cannot be identical unless they are coextensive. If a is identical with b, then a is coextensive with b. It is not possible to have b without a, and vice versa. It is evident then, that the role functionalist cannot regard higher order properties as being identical with the lower order properties. The higher order properties of the sciences are composed by lower order properties, but they are not identical with them. The higher order properties and the lower order properties in a composed entity could theoretically come apart. The higher order property of being money is realized by lower order properties of paper in some instances, but it can also be realized by the metal in coins and in innumerable other ways. This is called multiple realization. Acidity has real ontological status, and so do those properties that realize it.

On this view there are many layers of properties in the special sciences, one layer composed by some other layer whose properties are the subject of some yet more fundamental science, yet none of the layers is identical with the others. Each of the layers can be explained by the lower layers. The explanation of higher order properties in terms of lower order properties is done in terms of the making up relation, the relation of m-realization that one layer bears to another. To explain a higher order property in terms of a lower order property is to give an account of those lower order properties and of how they compose the higher order property. It is to tell what properties compose that higher order property and to map out their relations.⁴ The job of the scientist is to give us the details of this composition and this mapping. Although the properties of the special sciences can be explained in terms of their kindred sciences, none can be absolutely reduced to the other. The special sciences cannot be dispensed with.

Now that we have seen the role functionalist's view of the making up relation in the sciences, we can contrast it with realizer functionalism as developed and defended by David Lewis. According to Lewis (1972), in order to explain higher order properties we must first topic neutrally characterize the properties of our higher order sciences.⁵ This involves taking the causal role of some higher order property and characterizing it by means of a Ramsey sentence.⁶ A Ramsey sentence describes the causal role of a property; its L-role. To create a Ramsey sentence one takes all of the theoretical entities of a scientific theory and turns them into "variables bound by existential quantifiers". (Lewis, 1972, pg.251) Take some particular explanation: The Ice caused Joe to fall. To Ramsify the sentence we would take each of our theoretical entities, 'Joe' and 'Ice' and turn

them into variables bound by an existential quantifier. Our explanation would then begin with, “there is an x, there is a y...” and we would then link each of the variables with a ‘caused by’ connective or predicate.⁷ In this way we would produce an explanatory sentence devoid of any specific reference to the world. Lewis thinks that the resulting sentence, in this case, something like, ‘there is an x, there is a y and x caused y to fall’, has just as much explanatory power as did our original sentence.⁸

What you are left with is a highly abstracted, topic neutral description of the causal role of the higher order properties of that theory. After Ramsification, there is nothing but the most general abstract form of the causal relation left in the sentence. The functional role of the higher order property is the causal relationship specified by a particular Ramsey sentence. To play that functional role is to be the state of affairs that satisfies that Ramsey sentence. A lower order property L-realizes a higher order property just in case that lower order property satisfies the Ramsey sentence describing the causal relations of the higher order property. The relation of lower order properties to higher order properties is a semantic relation.

We are now in a position to see the implications of this theory. If the causal role of the higher order properties just is this topic neutral characterization and if to play a causal role is to be a state of affairs that satisfies that characterization, then it seems that one will have good grounds for alleging the identity of these higher order properties with lower order ones.⁹ For if one argues, as does the role functionalist, that higher and lower order properties are not identical, then, given the causal theory of properties, there needs be some way of distinguishing the causal roles of the higher order properties from those of the lower order properties. But if one describes causal roles as does Lewis there will be no satisfactory way to do this.¹⁰ If one were able to specify such a difference detectable in the Ramsey sentence, then the higher order property and the lower order property would no longer have anything in common.¹¹ There would be no similarity that explains why the one composes the other.¹² Why not then, says Lewis, reduce all those so-called higher order properties to the most fundamental properties of our most fundamental science, namely those of the fundamental particles of physics? It would appear that accepting topic neutral characterization and the causal theory of properties gives one good reason to think that higher order properties are identical with physical properties.

Combining these two ideas, his definition of a function¹³ and the

identity statement in question gives Lewis a powerful argument for absolute and complete reductionism in the sciences. Lewis (1972, pg.249) argues as follows:

- (1) A higher order property P, is identical with the property that plays a particular causal role R that is characterized by some topic neutral Ramsey sentence. (Definition)
- (2) The property that plays role R is identical with some lower order physical property Q.
- (3) Therefore, the higher order property P is identical with some physical property Q.¹⁴

On this view, what initially appeared as many layers of properties is really only one. The predicates of the higher order sciences refer to fundamental physical properties. In principle, if we were adept enough at our quantum physics, we could completely do away with all of the special sciences. We keep them around only for the sake of practicality.

As we have seen, a main point of contention between these two views is their view of the making up relation. Science seeks mechanistic explanations in terms of the making up relation. Lewis argues that this relation is one of identity. To identify some property P that makes up some other property Q is merely to discover that P is identical with Q.¹⁵ For the role functionalist, on the other hand, to discover that P makes up Q is to discover two ontologically distinct properties and some special relation between them. The main point of dispute is over the following question: Is the making up relation in the special sciences one of identity? In the next section I will attempt to answer the question in the negative.

III. THE DORMATIVE FALLACY AND IDENTITY THEORY

I will first argue that a proper notion of composition in the sciences must allow us to use it as a mechanistic explanation. I will then argue that the identity view of composition does not render a mechanistic explanation. I will argue this point by first explaining the dormative virtue fallacy. Second, I will diagnose what I take to be the flaw in this explanation and show that the identity theory shares this flaw. I will conclude by discussing one possible objection to this argument and offering a response.

Any adequate notion of scientific ‘making up’ must accord with common scientific practice. The composition relation in the sciences is commonly taken to do a certain kind of explanatory work. It is taken to give us a mechanistic explanation. The fact that diamond atoms are composed of carbon atoms is supposed to mechanistically explain the behavior of diamonds. How those carbon atoms are bonded is supposed to explain mechanistically why the diamond has the properties it has.

In his 1673 play “Le Malade Imaginaire”, Moliere mocks traditional Aristotelian explanations. In the famous passage he asks a doctor why opium puts people to sleep. The doctor responds, “Because there is a dormative virtue in it whose nature is to cause the senses to become drowsy”. This example has become a paradigm case of a bad explanation. In what follows I will refer to it as the dormative fallacy.

But why is this a bad explanation? The doctor was asked about a particular property of opium. He was asked why opium has this property and not another. The doctor’s answer was to explain the property of causing people to be sleepy in terms of the property of ‘having a dormative virtue’? We explain properties in terms of other properties all the time. As I mentioned above, we take it that the properties of carbon atoms give an appropriate explanation for the hardness of the diamond. Why is it that, in this case, we are unwilling to accept the doctor’s explanation? The answer is very simple. The ‘dormative virtue’ is simply another name for the property in question. The dormative virtue is identical with the property of putting people to sleep. The reason why this explanation bothers us is that the names involved are close enough to one another that they reveal this identity. The name ‘dormative virtue’ is close enough to ‘the property of making someone sleepy’ that we cannot help but notice that they have the same referent. The names reveal the structure of the explanation to us; they reveal that the structure of that explanation is one of identity. It seems that mechanistic explanation derives its power from being able to explain one thing in virtue of a different but related thing. We were looking for a mechanistic explanation here and instead we got an explanation of identity. Proper mechanistic explanations must proceed by explaining one property in terms of a different but related property.

The identity theory tells us that the making up relation is one of identity. It tells us that higher order properties are identical with lower order properties. It tells us that the property of hardness is identical with the property of carbon atoms being bonded in a certain way. It is an explanation of the same form as the dormative fallacy.

Clearly the identity theory bears a relevant analogy to the dormative fallacy. If we are to reject one, we should reject the other. Since we should reject the dormative fallacy, we should also reject the identity theory of composition.

The Lewisian might object to this argument by pointing out that there are instances, even within the sciences themselves, where we take identity to be an informative explanation. Consider the case of Clark Kent and Superman. One might ask what explains the queer fact that they never appear together in the same place. Surely a good answer to that question is that Clark Kent is identical with Superman. We would not feel the need for any further explanation in this case. Or consider the case of Hesperus and Phosphorus. It was a significant scientific discovery that the two are in fact the same planet, Venus. The realizer functionalist might ask why we are prepared to accept identity in these cases as an explanation, but not in others.

My response is that I have not here claimed that identity statements can never be informative at all or that they can never count as explanations or play some part in a scientific theory. Rather, what I have argued is that they cannot render explanations of a certain sort. They cannot offer us appropriate mechanistic explanations. This is what the scientists take themselves to be doing when they discover compositional relations. Clearly, the examples given above are not attempts at compositional explanations.

Identity relations are, many times, adequate answers to the question of how two different phenomena are related. Our question about Superman, for example, is just such a question. That Clark Kent is identical with Superman is a good answer to the question of how the observation I call Clark Kent is related to the observation I call Superman. It is a good answer to why I never seem to make both of those observations at the same time. The reason is that to observe Clark Kent is to observe Superman. Mechanistic explanations, by contrast, seek an answer to the question of why a particular property behaves the way it does rather than some other way, and it is here that identity cannot help us. What we need is an explanation in terms of the properties and dispositions of something different. We consider the dormative fallacy a fallacy because we are looking for a mechanistic explanation. We do not consider it a good answer because it answers the wrong question. It tells us that Clark Kent can fly when we really wanted to know how.

The identity theory can give us an informative answer to the ques-

tion of how higher order properties are related to lower order properties. Only it cannot give us an appropriate mechanistic explanation, which is what the scientists take themselves to be doing. At the very least, the identity theory is committed to a very strong error theory. It commits us to the view that scientists who take themselves to be offering mechanistic explanations are really offering explanations of a very different sort. To accept the identity theory then is to embrace a very different picture of the scientific enterprise. It is to accept a view of scientific explanation that is both counterintuitive and does not accord with actual scientific practice. These considerations against the identity view of the compositional relation give us a strong reason to prefer role functionalism to realizer functionalism as a general account of making up in the sciences.

Endnotes

¹See Shoemaker (1984), where he advances the view that the causal power of a property is what individuates the property, or “what determines its identity”. (pg.212) He says the account is “intended to capture what is correct in the view that properties just are powers, or that all properties are dispositional, while acknowledging the truth of a standard objection to that view, namely that a thing’s powers or dispositions are distinct from, because ‘grounded in’, it’s intrinsic properties”. (pg.213)

²To completely pacify the realizer functionalist, I should more correctly phrase the distinction linguistically, in terms of the reference and reduction of certain scientific predicates to others. But I think this will involve needless complication. For now, just note that the use of the terms higher and lower order properties in the description of the two theories does not mean that either theory has any ontological commitments in regard to these properties. It will become clear later on what those ontological commitments are, i.e., that the realizer functionalist, strictly speaking, does not *really* believe in higher order properties.

³Or between individuals via their properties.

⁴The views set out by Lewis in his seminal 1972 article are paradigmatic of realizer functionalism. In that paper he sets up his theory in opposition to a theory of reduction by which identifications are made “by positing bridge laws identifying some of the entities discussed in one theory with entities discussed in another theory...Identification are made, not found”. But I’m here taking role functionalism as asserting not that bridge principles are created that allow us, for the sake of parsimony, to speak in a certain useful way, but rather that the bridge principles themselves are discovered as a part of a compositional relation between two types of entities. (pg.249).

⁵That is, the sciences whose subject matter is involves the higher order properties.

⁶Topic neutral characterization is important to the mind body identity theory

in order to respond to the disparate properties argument (Levin, 2004). The identity theorist has to locate the differences between mental and physical predicates at the linguistic level; mental and physical predicates don't mean the same thing. The objection here, roughly, and in brief. Is that mental and physical predicates couldn't come to have different meanings unless they picked out some real difference in the world. See also Shaffer's "Mental Events and the Brain" (pg.67) and, in response, James Cornman's "The Identity of Mind and Body" (pg.73), both in *Materialism and the Mind-Body Problem*, David M. Rosenthal, ed. (Indiana: Hackett Publishing Company, 2000).

⁷For more on the history and background of Ramsey sentences, which were apparently independently discovered by Carnap, see Stathis Psillos (2006).

⁸For a more general and more thorough account of this process see Lewis (1970).

⁹See Lewis (1966).

¹⁰Intuitively, it looks as though the lower order properties would have the same general, topic neutral characterizations. The only discernable difference between them will be in their particular details, which will have been scrubbed away by the Ramsification process. This is to turn the argument from disparate properties on its head. See footnote 7.

¹¹What the role functionalist needs, I think, is for higher order properties to have some general pattern in common with their lower order properties, a pattern in virtue of which we can explain the composition relation between them and some specific pattern that differs between them by which we can distinguish them as distinct ontological entities. What Ramsification really does is preclude the possibility of making this distinction between general and specific causal roles.

¹²You would no sooner detail a difference in the causal roles of the higher and lower order properties in terms of a Ramsey sentence than Lewis would insist that you have an entirely different 'higher order' property.

¹³Or rather his idea of functional roles and what it is to play one.

¹⁴Lewis (1966) originally used a more general form of the argument to argue against mind body dualism.

¹⁵And thus that P does not really exist. Its status is merely semantic, and not ontological as we originally thought.

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