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A simple theory of rigidity

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Abstract The notion of rigidity looms large in philosophy of language, but is beset by difficulties. This paper proposes a simple theory of rigidity, according to which an expression has a world-relative semantic property rigidly when it has that property at, or with respect to, all worlds. Just as names, and certain descriptions like *The square root of 4*, rigidly designate their referents, so too are necessary truths rigidly true, and so too does *cat* rigidly have only animals in its extension. After spelling out the theory, I argue that it enables us to avoid the headaches that attend the misbegotten desire to have a simple rigid/non-rigid distinction that applies to expressions, giving us a simple solution to the problem of generalizing the notion of rigidity beyond singular terms.

Keywords Rigidity · Rigid designators · Predicates · General terms · Natural kinds

1 Introduction

In *Naming and Necessity* Kripke argued forcefully that ordinary proper names are rigid designators. A rigid designator designates the same object at all possible worlds in which that object exists, and never designates anything else.[1] To clarify—and the underlying point here is crucial to this paper—the idea is not that names

[1] This characterization, adapted from LaPorte (2008, Introduction), deliberately leaves open the question of whether a rigid designator should be said to designate its designatum at possible worlds where that designatum does not exist. I touch on this issue at the end of Sect. 4.

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could not have been used to name different things. Rather, when we use names to describe counterfactual scenarios, they continue to pick out their actual referents. By contrast, a definite description like *The teacher of Alexander* is a non-rigid designator, picking out whoever taught Alexander in the counterfactual scenario that is being described.

The thesis that names rigidly designate their actual referents is often expressed by calling names simply *rigid*. But this way of putting it encourages us to think of rigidity as a property which expressions simply have or lack. Then, when it comes time to consider extending the notion of rigidity beyond singular terms—and such extended use of the notion was already made in a rough, on-the-fly sort of way in *Naming and Necessity*, where Kripke argued that natural kind terms are rigid designators[2]—we end up asking questions like 'What does it mean to call a general term *rigid*?'. Such questions lead to proposals for extending "the" rigid/non-rigid distinction to expressions other than singular terms, and these proposals lead to difficulties.

There is a growing literature on such difficulties, especially difficulties arising from attempts to extend the notion of rigidity to general terms or predicates. I will argue that the problem of generalizing the notion of rigidity is solved by a simple theory of rigidity. On this theory, rigidity is modal invariance of a particular kind. I will spell out the theory in a moment, but to get a sense of the kind of modal invariance I have in mind, consider the Kripkean claim that *Aristotle* picks out Aristotle at all possible worlds in which Aristotle exists. This is a kind of modal invariance claim. But it is different from the claim that the name *Aristotle* could not have been used to pick out a different person. The Kripkean claim is not that in all possible worlds, *Aristotle* gets used by speakers to pick out Aristotle. Rather, it is that, when we in the actual world use the name *Aristotle* in describing counterfactual scenarios (possible worlds), the name picks out the same person at, or with respect to, each scenario. This contrast is often marked by contrasting uses of *at* and *in*, as introduced by Adams's (1981) influential discussion of truth *in* vs. truth *at* a possible world, helpfully summarised as follows in the *Stanford Enclyclopedia of Philosophy*:

> One way for something to be true with respect to a world requires the truth-bearer to exist in the world and be true there. Another way is for the truth-bearer to "correctly describe" the world, where this does not require existing in the world. Pollock gives the example of a picture depicting the non-existence of all pictures. The picture could correctly depict a situation even though the situation it depicts is one in which the picture itself does not exist. Similarly, the Medieval philosopher Jean Buridan discusses the example of an utterance of 'there are no negative utterances'. This utterance correctly describes a certain possible situation even though that situation is one in which the utterance would not exist. Following Adams (1981), we may call the former way of being true with respect to a world *truth in a world* and the latter *truth at a world*. (McGrath & Frank (2018), §7.2.)

[2] See Kripke (1980, Lecture III, especially p. 136).

Thus the sort of modal invariance with which I propose to identify rigidity may be called *intralinguistic* modal invariance: it is the *at* kind of modal invariance rather than the *in* kind.

Now to spell out the theory.

2 The Simple Theory

To state the simple theory of rigidity, I will use the notion of a *world-relative semantic property*. I will then use the notion of a *world-indexed semantic property* to give an equivalent statement of the theory that may be of additional help in understanding it. I now explain these two notions in turn.

In the conceptual framework of possible worlds semantics,[3] we have world-relative semantic properties: properties that an expression has with respect to, or *at*, possible worlds. For example, consider the property of *picking out Aristotle*. The expression *The last great philosopher of antiquity* arguably has this property with respect to the actual world, and lacks it with respect to worlds with different histories of philosophy. By contrast, the name *Aristotle*, according to Kripke at least, has this property with respect to all possible worlds, or at least all possible worlds in which Aristotle exists. Another example of a world-relative semantic property is the property expressed by *true* as used in possible worlds semantics. The expression *Aristotle was the teacher of Alexander* has this property with respect to the actual world, but lacks it with respect to worlds in which Aristotle did not teach Alexander. Other examples include the properties of having a non-empty extension, having an extension containing more than three members, and having a referent.[4]

To have a world-*indexed* semantic property is to have a world-relative semantic property at some particular world. For example, consider the property of *picking out Aristotle with respect to* @, where @ is the actual world. And consider the property of *picking out Aristotle with respect to* w, where *w* is some arbitrary world in which Aristotle exists but the history of philosophy proceeds very differently from in @. If Kripke is right about names being rigid designators, then *Aristotle* possesses both of these world-indexed semantic properties, while *The last great philosopher of antiquity* plausibly has the first while lacking the second. A world-indexed semantic property is determined by a pair consisting of a world-relative semantic property and a possible world. So, an expression denoting a world-relative semantic property

[3] See Nolan (2012) for a general philosophical introduction.

[4] Note that for this talk of world-relative semantic properties to make sense, one need not take the idea that they are *properties*—that is, *monadic* properties—metaphysically seriously. One can understand talk of world-relative semantic properties really to be about *relations* between expressions and worlds. It is natural to talk of 'properties' in this context, however. Another clarificatory point: it may be asked what semantic properties I mean to exclude with this talk of 'world-relative semantic properties', but if we're confining our attention to semantic properties as spoken of within the framework of possible worlds semantics, the answer may be 'none'. For even world-indexed semantic properties (in the sense about to be explained in the main text) may be regarded as themselves being had *at worlds*. The terminology should in that case just be regarded as highlighting the world-relativity of semantic properties as they appear in possible worlds semantics.

may be tagged with a subscript denoting a possible world to yield an expression denoting a world-indexed semantic property.

Using these concepts, I can now state the simple theory of rigidity in various ways. On this theory, rigidity can be characterized as a mode of possessing world-relative semantic properties—or alternatively, as a relation between expressions and world-relative semantic properties.

Construing rigidity as a mode, we get:

An expression E has a world-relative semantic property P rigidly iff E has P at every possible world.

Or construing rigidity as a relation:

Rigid(E,P) iff E has P at every possible world.

Using the notion of a world-indexed semantic property, we can give the following alternative statements of the theory:

An expression E has a world-relative semantic property P rigidly iff for all possible worlds w, E has the world-indexed semantic property P_w.

Rigid(E,P) iff for all possible worlds w, E has P_w.

Note that, on this theory, rigidity is not a property that expressions have or lack *simpliciter*. We need to specify what it is about the expression whose intralinguistic modal variability is in question. Necessary truths are rigidly true, *is a cat* rigidly has only animals in its extension (assuming that cats are necessarily animals), typical believers in bivalence will hold that all statements with truth-values are rigidly truth-valued while some believers in truth-value gaps will deny this, and so on. In general there is not just *one* useful rigidity distinction available for a given category of expressions.

The original case of rigid designation for singular terms, and the contrast between names like *Aristotle* and descriptions like *The teacher of Alexander* and *The last great philosopher of antiquity*, can be understood in terms of this theory. Note that on this theory, 'E is a rigid designator' does not mean 'E is rigid and E is a designator'. Rather, the idea is that E designates rigidly, i.e. that E rigidly designates some object. Thus we may explicate the notion of rigid designation for singular terms in the following way:

A singular term S is a rigid designator iff there is some object o such that S rigidly has the world-relative semantic property of designating o.[5]

[5] We may want to restrict our attention here to worlds in which o exists, so that e.g. *Aristotle* comes out as a rigid designator even if there are worlds in which Aristotle does not exist. More on this issue at the end of Sect. 4.

Now, this simple theory of rigidity may seem, as it were, too simple to be interesting. What is the point of advancing such a jejune-sounding theory? It may seem like just the obvious sort of thing one would come up with if asked, for some reason, to be unusually explicit about what one means by *rigidity* when talking philosophy of language. The interest of the theory, in my view, stems largely from the trouble that has arisen without it. There is a large and growing literature on the problem of generalizing the notion of rigidity beyond singular terms. In the next section, I will consider some existing proposals and difficulties facing them, focusing for concreteness on the issue of extending the notion of rigidity to general terms or predicates. In Sect. 4 I explain how the simple theory enables us to avoid these difficulties. Here the emphasis is largely on description: once we generalize the notion of rigidity properly, we can use it to say the things we want to say using that notion. In Sect. 5 I confront the issue of explanation. This is important, since part of the point of talking about rigidity has been that we can use the notion of rigidity to *explain* various modal phenomena. I largely follow Devitt (2005) in holding that the notion of rigidity can provide explanations of modal phenomena, but that these explanations are only moderately explanatory. I argue that this plausible view can be upheld given the simple theory.

3 Some existing proposals for generalizing the notion of rigidity

The sameness-of-extension proposal. If you have fallen into the trap of thinking of rigidity as a monadic property of expressions, one first thought you might have is that, if rigidity for names is sameness of referent across possible worlds, then perhaps we could say that rigidity for predicates is sameness of extension across possible worlds. But this has struck many as a non-starter: natural kind predicates that were supposed to count as rigid by Kripkean lights, like *is a cat* or *is a sample of water*, will fail to do so, since particular cats and samples of water in the actual world could have failed to exist. As Haukioja puts it:

> [...] sameness of extension clearly *cannot* be the proper characterisation of rigidity for predicates: the extension of a rigid predicate can vary from world to world. (Haukioja (2006), p. 156.)

The sameness-of-property proposal. Another natural thought is that a predicate is rigid iff it designates, or expresses, the same property in all possible worlds. This at least yields the desired Kripkean result that predicates like *is a cat* and *is a sample of water* come out as rigid. However, the proposal seems to overgenerate: predicates that are supposed to contrast with these as regards rigidity—e.g. *is a superficially cat-like thing* and *is a sample of watery stuff*—seem also to come out as rigid on this proposal. (For discussion see Salmon (2004) and Schwartz (forthcoming, §3).)

Now, it might be thought that even if this proposal does not allow us to make the distinctions having to do with natural kinds which we might have wanted to make using the notion of rigidity, it nevertheless enables us to make other distinctions that we want to make. For example, if redness is (contingently) my favourite property, then can't we say that *is red* is rigid and *possesses my favourite property* is non-

rigid? Perhaps, but even this is not straightforward: it seems that in some sense the latter predicate *also* designates or expresses the same property across possible worlds, namely the property of *possessing my favourite property*. (For discussion see Martí (2004), de Sa (2007), Martí and Martínez-Fernández (2011) and Haraldsen (2018).)

A more complex version of the sameness-of-property proposal is defended, with caveats, in Linsky (2006). Drawing on ideas of Lewis and, as an alternative, the notion of a 'second order definite description' (the details don't matter for our purposes), Linksy maintains:

> Both Lewis' account with double world indexes, and the second order definite description account are able to make out a distinction between rigid and non-rigid general terms. Admittedly this is at the cost of requiring a non-standard account of much ordinary predication and a non-standard account of the formation of the abstract singular terms that Soames uses, as well as expressions like ''being F''. The payoff for all these complicated innovations, however, is to be able to give a precise account of the notion that some general terms are rigid designators. (Linsky (2006), pp. 664–665.)

But these 'complicated innovations' do not, Linsky admits, get us what we might have wanted originally:

> Even on this alternative account most general terms such as *bachelor* and *red* will come out as rigid. (Linsky (2006), p. 665.)

The rigid applier proposal. Devitt (2005), developing a proposal briefly given in Devitt & Sterelny (1999, pp. 85–86), suggests the following extension of the notion of rigidity to general terms:

> [A] general term 'F' is a rigid applier iff it is such that if it applies to an object in any possible world, then it applies to that object in every possible world in which the object exists. Similarly for a mass term. (Devitt (2005), p. 146.)[6]

This proposal has been argued to be extensionally inadequate in both directions, given that we want to be able to use the notion of rigidity to distinguish natural kind terms from other terms. Schwartz (2002) argues that on this proposal, some terms for non-natural kinds, such as *television set*, are predicted to be rigid appliers: according to Schwartz, anything which is a television set in some possible world is a television set in all possible worlds in which it exists. Schwartz argues further that some terms for natural kinds, such as *frog*, fail to come out as rigid appliers: a given frog might have died while still a tadpole, had things gone differently.[7]

Devitt resists Schwartz's contention that *television set* comes out as a rigid applier, arguing that 'we need to distinguish what is essential to being a television

[6] Devitt (2005, f.n. 12) notes that a similar definition can be found in Cook (1980).

[7] For further criticisms of the rigid applier proposal, involving *hotter than* and the status of colour-terms, see Soames (2002, pp. 251–259).

set from what is essential to being the object that happens to be a television set' (Devitt (2005), p. 155). To be a television set, Devitt argues, is to have a certain kind of function, but a given television set—that very object—might have existed without having that function. On the other hand, Devitt is more inclined to grant Schwartz's contention about *frog*, 'for the sake of argument at least' (Devitt (2005), p. 155).

Issues with the status of Schwartz's examples aside, Devitt's position is that

> even if these claims are right, they are not grounds for dissatisfaction. As I have argued, it is a mistake to think that the primary task of the rigidity distinction is to distinguish natural kind terms from nominal kind terms. The primary task is to distinguish kind terms that are not covered by a description theory from ones that are. (Devitt (2005), p. 154.)

From the present point of view, this talk of 'the rigidity distinction' runs the risk of suggesting that, for a certain category of expressions, such as general terms or appliers, there is only room for one rigidity distinction. But this is false. Devitt's notion of a rigid applier is perfectly alright, but does not exhaust what can be said, even about appliers, by means of the notion of rigidity properly generalized.

This is powerfully illustrated by the fact that *even by Devitt's lights*, his notion of a rigid applier falls subtly short of doing everything he wants from the notion of rigidity. Devitt explains and admits this in the following passage:

> (17′) Anything is water iff it is a liquid that is more common than any other on Earth.
>
> (18′) Anything is water iff it is H_2O.
>
> (17′) is indeed contingent: in some possible world gin might have been more common than any other liquid on Earth. Yet (18′) is necessary: the water in any possible world will be H_2O and vice versa.
>
> Sadly, these phenomena cannot be fully explained by appeal to rigidity. (18′) determines that 'water' and 'H_2O' apply to the same stuff in the actual world. The rigidity of these terms then determines that these terms will still apply to that actual stuff in any possible world in which it exists. But we are still short of establishing the necessity of (18′). The problem is the *nonactual* stuff that the terms refer to in other possible worlds. Rigidity determines that when one of the terms applies to some nonactual stuff in a world it will do so also in any world where that stuff exists. But that does not determine that the *other* term will apply to *that same stuff* in those worlds, which is what we need to establish the necessity. (Devitt (2005), p. 152.)

The simple theory has the power to alleviate Devitt's sadness; while, as he explains, we cannot use exactly his notion of a rigid applier to explain (18′)'s supposed

necessity,[8] there are rigidity-involving facts in the ballpark which can furnish a kind of explanation of (18′)'s necessity. We can say that *water* rigidly applies to H_2O, meaning that at all possible worlds w, the term *water* applies to any H_2O there is at w and to nothing else. And we can of course say the same about H_2O. (I will return to this example in Sect. 5 when I consider explicitly the explanatory status of the notion of rigidity.)

The negative proposal. Problems affecting proposals like the above have led some authors to give up on generalizing the notion of rigidity beyond singular terms. Witness Soames in *Beyond Rigidity*:

> I argue that there is no natural way of extending the concept of rigidity from singular terms to predicates that vindicates the central doctrines of *Naming and Necessity*. (Soames (2002), p. vii.)

Soames is not the only one. Arguing against LaPorte's (2000) defense of a version of the sameness-of-property proposal, Schwartz (2002) writes:

> The notions of rigidity and non-rigidity do not usefully apply at all to kind or other general terms. Extending the notion of rigidity from singular terms such as proper names to general terms such as natural kind terms is a mistake. (Schwartz (2002), p. 265.)

And later:

> The rigid/non-rigid distinction is quite useful and indeed indispensable with singular terms, but has been over-extended to general terms. (Schwartz (2002), pp. 275–276.)

Another author who takes this line is Nimtz:

> [...] an extensive debate has failed to secure a general notion of rigidity apt to play the classificatory-cum-explanatory role Kripke characterizes in terms of rigidity. (Nimtz, 2019, pp. 332–333.)

Nimtz advocates looking for an alternative:

> What are we to do, then? I propose that we look for an alternative to generalized rigidity. (Nimtz, 2019, p. 333.)

Nimtz's suggested alternative, that of being a *paradigm term* (see his article for explanation), may well be of substantial interest. Nevertheless, from the present point of view it is a mistake to look for another monadic property of expressions that will do what we wanted from rigidity, since it is a mistake to think of rigidity in general as a monadic property of expressions in the first place. With the simple theory in hand we avoid these mistakes, and can generalize the notion of rigidity with ease.

[8] It should be noted that the notion of an *essentialist predicate*—discussed by Soames (2002, p. 251) and at length by Gómez-Torrente (2006)—can be applied to the predicates in (18′) to explain (18′)'s necessity. But again, this notion tailor-made for predicates does not let us say everything that can be said about predicates by means of the notion of rigidity properly generalized.

4 The proper generalization

Questions like 'When should a predicate count as rigid?', at least in the absence of some special convention, are not well-formed. An expression can do one thing (or be one way) rigidly while doing another thing (or being another way) non-rigidly. The apparent problem of saying when a predicate counts as rigid, and analogous problems for other kinds of expressions, dissolve once this is appreciated.

On the other hand, some of the difficulties that arise when we try to extend the notion of a rigid *designator* to non-singular terms do not automatically dissolve, but they are orthogonal to the issue of extending the notion of rigidity. Do predicates designate? Do general terms like *cat* designate? Do mass terms like *water* designate? What do they designate? Can they designate more than one thing? These are not problems about extending the notion of *rigidity*—they are problems about extending the notion of *designation*.

Given a clear account of what it means for an expression of a certain kind to designate something at a world, we can then talk about rigid designation in connection with expressions of that kind. (If for example we use *designate* in connection with predicates to express the traditional notion of divided reference, so that a predicate may be said to designate each thing in its extension, we may say that *is a cat* rigidly designates animals of a certain kind.) But perhaps some insights that might sometimes have been put loosely by talking about rigid designation—and only sometimes; in *Naming and Necessity* Kripke often makes the relevant points without using *rigid* at all—are better put by talking about rigidity in some other connection.

All the relevant Kripkean semantic and modal insights—assuming that they are insights—can be put in terms of rigidity in some way or other (and often more than one way). For example, we might say that *Water is H_2O* is necessary—rigidly true, in other words—because *water* rigidly covers only H_2O. The predicate *is a sample of water* rigidly has only samples of H_2O in its extension, whereas *is a sample of watery stuff*, while it may have only samples of H_2O in its actual extension—that depends on whether there is anything else watery in our world—doesn't rigidly have only samples of H_2O in its extension. *All cats are animals* is necessary because *cat* rigidly covers only animals. *Everything that is a cat is an animal* is necessary because the extension of *is a cat* rigidly contains only animals. *Heat* rigidly applies only to molecular motion, but *pain*—even if all the pain in our world involves the firing of C-fibers—does not rigidly apply only to phenomena involving the firing of C-fibers. We can even express Kripke's view of unicorns, or a strengthening of it,[9] by saying that the extension of *is a unicorn* is rigidly empty. And so on. To be sure, the details of how we should put rigidity-related points may sometimes be contentious, and may raise metasemantic issues associated with different sorts of

[9] See Kripke (1980, p. 24, pp. 157–158). Though many have taken Kripke's remarks here to commit him to the view that unicorns necessarily do not exist, Kripke pulls back from this, urging nevertheless that we cannot say under which circumstances there would have been unicorns, with the result that we are unable to make any clear case for the view that there might have been unicorns.

expressions. But these are not problems that especially concern the generalization of the notion of rigidity.

The proper generalization also enables us to articulate, as special cases, the notions at work in the proposals considered above. To capture the notion at work in the sameness-of-extension proposal, we can speak of a predicate having its actual extension rigidly (e.g. *is an even integer*). To capture the notions at work in the sameness-of-property proposal, we can speak of a predicate rigidly expressing the property it expresses (and perhaps all predicates do this insofar as they express properties at all), and we can also speak of a predicate (e.g. *possesses my favourite property*) rigidly expressing the property it expresses while also non-rigidly ascribing, indirectly, the property of *redness*. To capture the notion at work in the rigid applier proposal, we can speak of an applier rigidly having in its extension any objects it has in its extension at any possible world (if, that is, we understand this as qualified in such a way that these objects don't need to exist in all possible worlds—more on such qualifications in a moment).

We can even capture an insight from the negative proposal: insofar as we are confined to treating the notion of rigidity as always designation-related, or always a property that expressions simply have or lack, it may indeed be better not to bother trying to extend it beyond singular terms. We could, I suppose, still ask 'What is the best unqualified use of *is rigid* as said of expressions?'—either with regard to a particular category of expression, or across the board—but such a question largely loses its interest once we have in hand the simple theory and the generalization it affords.

To conclude this section, a word on qualifications. In the proper name case, it is natural to qualify the claim that names rigidly designate their actual referents by explicitly defining *rigid designator* in terms of all the possible worlds in which the actual referent exists. (Some remarks of Kripke's have led people to think that this is his notion of rigidity, but other remarks strongly suggest otherwise, e.g.: 'If you say, "suppose Hitler had never been born" then "Hitler" refers here, still rigidly, to something that would not exist in the counterfactual situation described.'[10]) But once rigidity is generalized, different qualifications may be natural in different cases. For example, we might want to say '*John loves Mary* rigidly ascribes the loving relation to John and Mary (in that order)', and we might want this to come to the same thing as '*John loves Mary* ascribes the loving relation to John and Mary (in that order) at all possible worlds in which John and Mary both exist'. But if we want to say '*John loves the number 7* rigidly ascribes the loving relation to John and the number 7 (in that order)', we might be happy for this to come to the same thing as '*John loves the number 7* rigidly ascribes the loving relation to John and the number 7 (in that order) at all possible worlds in which John exists' (i.e., we don't need our qualification to cover the second relatum in this case, if it exists in all possible worlds).

If we want to allow such qualifications, one option is to think of *rigid* and cognates as having different meanings depending on which qualifications we want to make. However, I suggest that it is simpler to think of these terms as always

[10] Kripke (1980, p. 78). See LaPorte (2008, §1.2) for discussion and further references.

meaning the same thing even when qualifications are countenanced: invariance with respect to all *relevant* possible worlds. That way we do not have to keep track of different definitions of the terminology of rigidity, and may achieve the desired results by, either implicitly or explicitly, restricting our attention to the appropriate range of possible worlds (which may be characterised by the existence in them of various referents or extension-members, but also in any number of other ways). Going explicit, we may say things like 'Confining our attention to worlds in which Socrates exists, *Socrates* rigidly designates Socrates' and 'Confining our attention to worlds in which their actual referents exist, non-empty proper names are rigid designators'.

5 Explaining modal phenomena

So far I have largely confined myself to arguing that the simple theory allows us to say what philosophers have wanted to say using the notion of rigidity. But the notion of rigidity has not only been regarded as offering us a way of *describing* how things stand with expressions of various kinds. It has also been regarded as giving us the means to *explain* various phenomena, such as the modal status of certain statements. For example, the necessity of an identity statement like *Cicero is Tully* may be explained by pointing out that the names involved are rigid designators. If the names both designate their actual referent in all worlds in which that referent exists, and never designate anything else, then—together with the fact that an identity statement involving proper names is true when the names involved designate the same object—it follows that *Cicero is Tully*, or at least *If Cicero exists, then Cicero is Tully*, is a necessary truth. Thus we get a kind of explanation of the modal status of a certain statement couched in terms of the notion of rigidity.

Similarly, not just overall modal status, but various aspects of the modal profiles of certain statements may be explained, after a fashion, using the notion of rigidity. As Devitt notes, the pair of statements *Aristotle was fond of dogs* and *The last great philosopher of antiquity was fond of dogs* have different modal profiles: whether the first is true at a world w depends on whether, at w, the individual we in the actual world designate with *Aristotle* is fond of dogs. This is not in general the case with the second statement. This difference in modal profile may be explained by means of the fact that *Aristotle* is a rigid designator while *The last great philosopher of antiquity* is not.

Now, explanations of this sort may leave something to be desired. (Devitt calls them 'rather superficial'.[11]) But make no mistake, they are the paradigms of how rigidity is supposed to be explanatory, and analogous explanations can be given using the notion of rigidity in other connections. We have already touched on this kind of explanation, but let us illustrate in a bit more detail with Devitt's example (18′) discussed in Sect. 3—the necessity of *Anything is water iff it is H_2O*—which brought out a subtle limitation of his notion of a rigid applier. Granting orthodox

[11] Devitt (2005, p. 159).

assumptions about the example for the sake of illustration, the necessary truth of this statement may be explained by the fact that both *water* and H_2O rigidly apply to H_2O. In other words, at all possible worlds *w*, *water* has the property *applying to* H_2O, i.e. applying to any H_2O there is and to nothing else. This means that *Anything is water iff it is* H_2O isn't false at any world, since for it to be false at a world *w* there would have to be some stuff at *w* to which one of *water* and H_2O applies and the other does not, which is ruled out by their both rigidly applying to H_2O. Likewise, the possible falsity of *Anything is watery stuff iff it is* H_2O may be explained by the fact that *watery stuff*, unlike both *water* and H_2O, does not rigidly apply to H_2O. I.e. it is not the case that *watery stuff* applies to H_2O at all worlds. I.e. at some worlds, *watery stuff* applies to some stuff that is not H_2O. That stuff constitutes a counterexample to *Anything is watery stuff iff it is* H_2O, hence the latter is false at some worlds.

Admittedly, there is one thing that we don't get from the simple theory of rigidity: we don't get a single monadic property of expressions that figures in all of these explanations. But so what? The notion of rigidity is still a single, unified idea. Metaphysically, we may think of rigidity "adverbially", as a mode of having properties, and then we can say that it's the same thing in question every time. Or we might think of it as a relation between expressions and world-relative semantic properties. And there are certainly further options. The theory of rigidity in this paper is not a metaphysical theory about what kind of thing rigidity itself is. (I'm not sure whether there's any real point in theorizing about rigidity in that way, but if there is, I don't pretend to be delivering *those* goods.) Rather, I've offered a kind of analysis, or fruitful definition, of the notion of rigidity. And however we think of rigidity itself metaphysically, one and the same notion of rigidity may be used in various connections to give a kind of explanation of various modal phenomena. These explanations may leave something to be desired, but that is true even in the paradigm case of names. So again, once we free ourselves from thinking of rigidity as a monadic property of expressions, we get a simple solution to the problem of generalizing the notion of rigidity.

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