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Contributed Paper

# On the Impossibility of the Lewisian Reduction of Modality<sup>1</sup>

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## Abstract

One of the central issues in modal metaphysics is whether the reduction of modality is feasible. The most influential reductive theory in the debate is Lewis's "modal realism," which identifies possible worlds with maximal spatiotemporally related wholes. Numerous attempts have been made to argue for or against its plausibility and acceptability. In this paper, we aim to show the impossibility of the Lewisian reduction of modality in light of the explanatory power resulting from such a reduction. First, a general metametaphysical background of reductive theories of modality is delineated. Second, the explanatory-power-based argument against the possibility of the Lewisian reduction is presented, the key being the precise understanding of the power of what is called the "island universes" objection. The discussion enables us to get a clear appreciation of the options for modal theorizing.

## 1 General Background: Ontology and Ideology

In the field of modal metaphysics, countless studies have been made

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<sup>1</sup> Portions of section 2 of this paper, in altered form, have appeared in the paper read at the research seminar held on August 10, 2011, at Keio University, with Prof. Takashi Yagisawa (California State University) serving as a guest commentator.

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on the problem of whether modality can be reduced to some notions or others. As is commonly known, it is Lewis's reductive theory, "modal realism," that has had the most powerful influence over the debate.<sup>3</sup> Whether his theory is plausible and acceptable or not has provoked a great deal of controversy. Although most philosophers have rejected his theory and have attempted to establish its unacceptability, the question is still in controversy.

What seems to be lacking in the debate is a full assessment of the *explanatory power* of a theory resulting from the Lewisian reduction of modality. It is from this angle that this paper aims to make an contribution toward the debate. The key to determining the question from such a point of view is what is called the "island universes" objection. We claim that not only is Lewis's theory in particular unacceptable, but so also are *Lewisian* reductive theories in general. That is because the Lewisian reduction is doomed to failure in light of the explanatory power of a theory it results in. This insight offers us a clear understanding about how we can choose from the theoretical options for further research on modal metaphysics.

Let us start by reviewing the general background of reductive theories of modality. The review requires us to focus on some criteria of the assessment of theories.

There are two types of commitments of a theory: *ontological* and *ideological*. Roughly speaking, the ontological commitment of a theory is concerned with how many (kinds of) entities the theory posits. On the other hand, the ideological commitment of a theory is concerned with how many (kinds of) conceptual primitives the theory employs. These two types of commitments correspond to two types of *structures of reality*. For example, if we include *properties* in our theory, it is one of the ontological commitments of the theory, and it is taken to reflect an ontological aspect of reality. On the other hand, if we include—in addi-

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<sup>3</sup> Lewis (1986).

tion to such category of entities—a primitive notion of *instantiation*, it is one of the ideological commitments of the theory, and it is taken to reflect an ideological aspect of reality.<sup>4</sup>

The two types of commitments offer us two types of theoretical virtues: ontological parsimony and ideological parsimony. Clearly they are closely related and we often face questions over the trade-off between them. The two types of commitments also offer us two types of strategies for attack on a metaphysical theory. On the one hand, we may try to catch ontological “cheaters” by pointing out some unjustified conceptual primitive employed in a theory, and showing how it can be reduced within the realm of ontology. On the other hand, we may try to catch ideological “cheaters” by pointing out the insufficiency of the putative ontological ground for some notion, and showing how we can describe and explain a certain range of discourse or phenomena in a satisfactory way by employing the notion in question as primitive.

There is no mechanical recipe for solving the questions about the trade-off between ontology and ideology, and there is no general strategy for attack on metaphysical theories. We have to give considerations on a case-by-case basis. Of course, reductive theories of modality are intended to gain ideological parsimony. However, it is not clear whether or not such theories are vulnerable to the charge that their ontologies cannot give a ground for our modal discourse. The subsequent discussion over the feasibility of the Lewisian reduction can be seen as a case study in this regard.

## 2 The Explanatory Limit of the Lewisian Reduction

Now we shall discuss the power of the “island universes” objection to Lewis’s theory. It focuses on his definition of a possible world as a maximal spatiotemporally related whole. This definition rules out not only the

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<sup>4</sup> The term “ideology” in this sense comes from Quine. See Quine (1951) and Quine (1953). See also Sider (2011), § 2.3

possibility of an absolutely empty world, but also the possibility of the existence of a single world containing two disconnected spacetimes. This is because, according to Lewis's definition, two disconnected spacetimes have to be counted as two worlds rather than one. However, it is intuitively possible that there exist disconnected spacetimes, since there is no incoherence in the assumption of such a possibility. That is, it seems that there possibly exist pairs of things that are in no way spatiotemporally related to each other.<sup>5</sup>

In fact, this objection can be applied to the *Lewisian* reduction of modality in general. Take an arbitrary relation  $R$ , and define a possible world as a maximal  $R$ -related whole. This definition rules out the possibility of the existence of a single world containing two  $R$ -disconnected wholes. This is because, according to the definition, two  $R$ -disconnected wholes have to be counted as two worlds rather than one. However, it is intuitively possible that there exist  $R$ -disconnected wholes, since there is no incoherence in the assumption of such a possibility. That is, it seems that there possibly exist pairs of things that are in no way  $R$ -related to each other. In what follows, the phrase "island universes" is meant to be understood in this generalized sense.

On the basis of this generalization, we can argue against the Lewisian reduction as follows:

- (1) The existence of island universes is intuitively possible.
- (2) The Lewisian reduction of modality cannot accommodate the possible existence of island universes.
- (3) If a reductive theory of modality is successful, the theory can accommodate any possibility the assumption of which has some intuitive justification.
- (4) Therefore, the Lewisian reduction of modality is not successful.

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<sup>5</sup> Cf. Bigelow and Pargetter (1987).

(1) and (2) have been already shown. How about (3)? Is it an excessive requirement for a successful reduction of modality? Here is R. Cameron's critical remark on this matter:

It should come as no surprise that there's something like the "island universes" objection to Lewis. To avoid primitive modality, there needs to be some non-modal analysis of "in the same possible circumstance." For Lewis, this is analyzed in terms of spatio-temporal relatedness, but no matter what relation one appealed to, there's going to be the potential objection that the analysis rules out the otherwise apparent possibility of two things co-existing but not standing in that relation. We can avoid the possibility of any such objection by invoking a modal primitive that lets us say that two things are in the same possible circumstance. ... But while avoiding such objections might be an advantage, the cost is large: to give up on a thorough reduction of the modal.<sup>6</sup>

He thinks that we must, when evaluating of the success of a reductive theory, attach a great deal of importance to whether it accomplishes a thorough reduction of modality; that the advantage of the thorough reduction outweighs the defect of excluding the possibility of island universes. We claim that this is a serious error in the evaluation of reductive theories. We should not underestimate the explanatory inferiority of Lewisian theories of modality. Lewisian theories cannot allow the possibility of island universes. Such a theoretical restriction at the very outset is a terrible inferiority for any realistic theory of modality, which is motivated by our robust sense of reality about possibility and necessity, and which should make a sufficiently satisfactory analysis of our modal discourse. Therefore, the alleged greater theoretical economy of a Lewisian theory as compared with a theory that employs primitive modality

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<sup>6</sup> Cameron (2010), p. 788.

should not be taken as a reason to prefer the former to the latter. Even if we have to invoke some modal primitive in order to accommodate the possible existence of island universes, the explanatory superiority of a theory resulting from such an invocation is so marked that it is still a better theory than any Lewisian theory. In this light, Cameron's above observation that "no matter what relation one appealed to, there's going to be the potential objection that the analysis rules out the otherwise apparent possibility of two things co-existing but not standing in that relation" should be taken as a good case for the infeasibility of the thorough reduction of modality.

Of course, it is a difficult matter of debate how we should evaluate competing philosophical theories in terms of a "cost-benefit" model. Nevertheless, while it is not obvious that it costs a lot to invoke some sufficiently motivated primitive with the view to analyzing our modal discourse in a realistic spirit, it is clear that it costs terribly much to impose on a realistic theory some restriction that deprives the theory of its explanatory power in a crucial way. Cameron's critical remark quoted above misses this point and puts the cart before the horse.

The important point to note is that the explanatory difficulty besetting the Lewisian reduction is not just a matter of the collision with the realistic spirit by which any reductive theory of modality is animated. It might be argued, against the discussion above, that metaphysical theories sometimes revise our intuition on properly metaphysical grounds, and the exclusion of the possibility of island universes can be justified as one such revision. True enough, our intuition may be revised in the course of metaphysical investigations. However, there is a crucial difference in this regard between a theory of modality and any other metaphysical theory: while the latter tries to demarcate the range of metaphysical possibilities concerning a certain subject matter on the basis of various theoretical considerations, the former tries to reveal *what is "possibility" in the first place*. This difference imposes a distinctive constraint on a would-be successful theory of modality: it must not ex-

clude, by the definition of “possibility,” any possibility the assumption of which has some intuitive justification, since otherwise, it would restrict the range of metaphysical possibilities at the very outset, resulting in an unsatisfactory illumination of the nature of “possibility.” Metaphysical theories may revise our intuition about what is possible, but it must be on metaphysical grounds concerning the nature of some notion other than “possibility” that such a revision is carried out: in the case of the question over the possible existence of spatiotemporally isolated entities, for instance, the illumination of the nature of the spatiotemporal relation may fit the bill. Without any such ground, we are not allowed to restrict the range of metaphysical possibilities just because we can promote some theoretical virtue at the cost of the restriction.

Lewis himself is aware of his own theory excluding of the possibility of island universes. He writes:

I admit some inclination to agree with [the possibility]. But it seems to me that it is no central part of our modal thinking, and not a consequence of any interesting general principle about what is possible. So it is negotiable.<sup>7</sup>

However, whether or not the possibility of island universes has some central place in our modal discourse and whether or not it follows from some general modal-metaphysical principle are irrelevant to the appreciation of its significance in modal theorizing. In order to appreciate it, we only have to draw attention to, as just explicated, the distinctive constraint on a successful theory of modality; even if Lewis’s remark is correct, it never establishes that the possibility of island universes is “negotiable.”<sup>8</sup>

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<sup>7</sup> Lewis (1986), p. 71.

<sup>8</sup> Bricker (2001) argues against Lewis in this regard that the possibility of island universes does follow from general principles about what is possible.



### 3 Remaining Options for Modal Theorizing

We end the discussion by making a brief remark on the theoretical options for further research on modal metaphysics. They can be classified into three main types (although only the first and second types are desirable).

First, we may insist on reducing modality in the framework of possible worlds. Now that the Lewisian reduction has proved to be infeasible, it might be thought that some satisfying version of *actualistic ersatzism*, which is best known as an influential rival of Lewis's theory, has to be sought if we stick to the reduction by possible worlds. However, the ersatzist strategy, based on linguistic constructions for reducing modality, has already proved to be problematic in many respects.<sup>9</sup> Now, what will emerge as the most natural remaining option is already suggested in the above quotation from Cameron: "invoking a modal primitive that lets us say that two things are in the same possible circumstance," that is, *taking "worlds" to be primitive*.<sup>10</sup> If we choose this option, while the problem of the possibility of island universes can be avoided, the *thorough* reduction of modality is abandoned. Nevertheless, it is still a reduction in a more moderate sense, because it can say something illuminating by analyzing the modal notions of possibility and necessity in terms of a more basic notion, albeit still modal.<sup>11</sup> This strategy contains no vicious circularity of the kind found in ersatzism, and so the former has much more explanatory power than the latter.

If we hesitate to accept the primitive modality in the ontology of

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<sup>9</sup> For a brief survey, see Sider (2003), pp. 188–190.

<sup>10</sup> This is the position T. Yagisawa takes. See Yagisawa (2002) and Yagisawa (2010). At first sight, his position might be seen as radical in this regard, but in fact, it is a rather natural position from the point of view of the present discussion.

<sup>11</sup> Yagisawa (2010) calls this "soft reduction" (see pp. 150–153).

worlds that is *specially designed* in order to analyze our modal discourse, the second type of option emerges: proposing the reduction of modality in terms of some notions other than possible worlds. A highly metaphysical attempt at such a reduction is based on the notion of *essence*.<sup>12</sup> If this notion has to be employed by successful metaphysical theories *irrespective* of the questions over modality, this strategy is hopeful. On the other hand, if we take a skeptical stand on the need for such an Aristotelian-metaphysical notion as essence, we may choose other options for reduction, such as *modal conventionalism*.<sup>13</sup>

Third, we may abandon the reduction of modality altogether: *modal primitivism*. This is, however, the last resort. Clearly we cannot be satisfied with this option until it is proved that the other options are all infeasible.<sup>14</sup>

## Conclusion

We have attempted to determine the question of whether Lewis's reductive theory of modality is acceptable in light of the explanatory power that any reductive theory must have if it is to be successful. On the basis of the generalization of the island universes objection to Lewis's theory, it has been claimed that the Lewisian reduction of modality is doomed to failure because of its explanatory insufficiency and that the theories that rest on it are all unacceptable. Furthermore, we have seen that our discussion enables us to get a clear appreciation of the options for modal theorizing. This is a positive result that can be obtained from our negative insight in the discussion.

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<sup>12</sup> See, for example, Correia (2011) and Fine (1994).

<sup>13</sup> For a survey, see Sider (2003), pp. 201–218.

<sup>14</sup> Of course, the remaining options share the “realistic” spirit in the sense that they all regard our modal claims as objectively and non-trivially true or false.

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