

**LEWIS ON THE CONSTRUCTION OF WORLDS: THE METAPHYSICAL, EPISTEMIC  
AND PRACTICAL COSTS OF MODAL REALISM**

by

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## **Abstract**

This thesis considers the metaphysics and logic of modalities. In the first section, I give a background to modal realism and present Lewis' motivations for proposing such a view. In the second section, I explain what it means for a theory of modality to be 'successfully reductive', why a reduction of modality is important and why Lewis' view is considered successfully reductive. In the third section, I explain Lewis' commitments regarding trans-world individuals. In the fourth section, I explain Lewis' views on impossibility. The final sections will be dedicated to clarifying Lewis' metaphysical commitments towards the largest domain of possibility and working out their metaphysical, ontological and practical implications. To be clear, this thesis is not intended as a refutation of modal realism. Such a refutation is impossible. Lewis defends modal realism on the grounds of a cost benefit analysis. He believes that the benefits that come with accepting modal realism are enough to justify one's belief in it. An empirical refutation is impossible because there is no way to verify or falsify the existence of Lewis' plurality. Every possible world is spatiotemporally isolated from the actual world. Instead of attempting to refute modal realism, this thesis is intended to clarify the fundamental metaphysics of modal realism for the purpose of highlighting the fact that some metaphysical, epistemological and practical costs come with embracing modal realism. The costs I outline are aspects of modal realism that ought to be considered before embracing modal realism.

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## **Introduction**

This thesis considers the metaphysics and logic of modalities. Modalities can take many different forms: alethic modalities involve what is possible and what is necessary; deontic modalities involve what is obligatory and what is permissible; epistemic modalities, what one knows and what one believes; temporal modalities deal with the past as the undoable, and the future as potential. Modals are ubiquitous in language and abound in arguments. One common example of reasoning with modalities is the simple argument: I know I should get my homework done for next class but there is no way it will be finished by then; so I won't work on it. The expressions 'know', 'should', 'no way', and 'won't' are all modalities. For the purpose of this thesis, I focus only on alethic modalities.

The primary alethic modality discussed in this paper is the modality 'possible'. The dominant understanding of what it means for 'possibly P' to be true, is: 'Possibly P' is true if and only if, in some possible world within a *specified domain of worlds*, 'P' is true. This understanding of 'possible', allows for distinct interpretations of 'possible' depending on how we interpret possibility. Consider the sentence: 'it is possible for David Lewis to run faster than the speed of light'. The sentence is false if we interpret 'possible' as 'physically possible', since it is physically impossible for a body to run faster than the speed of light. If we interpret 'possible' as 'physically possible' we also restrict the domain of possible worlds to worlds that are considered physically possible'. However, if we interpret 'possible' as 'logically possible', the proposition is true. This is because the domain of *logically* possible worlds is larger than the domain of

*physically* possible worlds. Our interpretation of ‘possibility’ affects the truth of the sentence because different interpretations refer to different domains of worlds.

The best way to understand *domains of worlds* is to think of a domain of worlds as a set that contains possible worlds. The largest domain of worlds is the set that contains every possible world. This is referred to as the unrestricted domain. A restricted domain of possible worlds refers to a set of worlds contained within the set of all possible worlds. Some restricted domains are larger than others, for example the domains of worlds that is considered *physically* possible is smaller than the domain of worlds that is considered *logically* possible. The set of *physically* possible worlds contains every possible world that shares the exact same physical laws with the world we live in. The set of *logically* possible worlds contains every possible world that does not violate a logical law. The set of worlds that are considered physically possible relative to the actual world are the worlds that share the same physical laws as the actual world. There is no world within the set of worlds that are considered ‘physically possible relative to the actual world’ that operates by a different set of physical laws. However, there is no logical law preventing a world from having physical laws that differ from the physical laws that govern the actual world. Hence, there are some worlds within the set of logically possible worlds that are governed by physical laws that are distinct from the laws that govern the actual world. Thus, the set that contains all physically possible worlds is smaller than the set that contains all logically possible worlds.

The contemporary understanding of possibility brings about two metaphysical issues. The first is: what are possible worlds or more specifically, what kinds of things ought to be

considered possible worlds? The second is: what constitutes the largest domain of possible worlds?

Primarily, this paper focuses on David Lewis' Modal Realism, which is an account that purports to answer these questions. Modal realism is the thesis according to which "absolutely every way that a world could possibly be is a way that some world is" (*On the Plurality of Worlds* 2, 86); in other words, every possible world exists. More specifically, modal realism is the ontological thesis that holds that:

- 1) absolutely every way that a world could possibly be is a way that some world is" (*On the Plurality of Worlds* 2, 86).
- 2) "absolutely every way that a part of a world could possibly be is a way that some part of some world is" (*On the Plurality of Worlds* 2, 86)

Let's focus on what Lewis means by 'is' in the phrase 'some world is'. For Lewis, the word 'is' comes existentially loaded; it implies existence. Thus, Lewis believes that for every way a world possible could be, there exists a possible world, and that, for every way a part of a world could be there exists a part of a possible world.

Modal realism is typically met with what Lewis calls 'the incredulous stare', as the position implies unusually prolific metaphysical commitments. For example, modal realism commits one to the belief that there exists a world that is completely made of spaghetti, a world where the story of Star Wars takes place, and even a world where there are more jobs in philosophy than applicants. However, incredulous stares notwithstanding, modal realism garners impressive respect among philosophers due to Lewis' defense of the view. The purpose of this

thesis is twofold. The first is to evaluate Lewis' answers to the two metaphysical issues outlined above. The second is to illustrate and analyze the metaphysical and practical implications of modal realism.

The structure of this thesis is as follows: in the first section, I give a background to modal realism and present Lewis' motivations for proposing such a view. In the second section, I explain what it means for a theory of modality to be successfully reductive, why a reduction of modality is important and why Lewis' view is considered successfully reductive. In the third section, I explain Lewis' commitments regarding trans-world individuals. In the fourth section, I explain Lewis' views on impossibility. The final sections will be dedicated to clarifying Lewis' metaphysical commitments towards the largest domain of possibility and working out their metaphysical, ontological and practical implications. To be clear, this thesis is not intended as a refutation of modal realism. Such a refutation is impossible. Lewis defends modal realism on the grounds of a cost benefit analysis. He believes that the benefits that come with accepting modal realism are enough to justify one's belief in it. A refutation is impossible because there is no way to verify the existence of Lewis' plurality. Every possible world is spatiotemporally isolated from the actual world. Instead of attempting to refute modal realism, this thesis is intended to clarify the fundamental metaphysics of modal realism for the purpose of highlighting the fact that some metaphysical, epistemological and practical costs come with embracing modal realism. The costs I outline are aspects of modal realism that ought to be considered before embracing modal realism.

## **Section 1: Lewis' Modal Realism**

To begin, I focus on a quote that reveals Lewis' motivations for adopting modal realism:

When I say possible worlds help with the analysis of modality, I do not mean they help with the metalogical 'semantic analysis of modal logic'. Recent interest in possible worlds began there, to be sure. But wrongly. For that job, we need no possible worlds. We need sets of entities which, for heuristic guidance, 'may be regarded as' possible worlds, but which in truth may be anything you please... Where we need possible worlds, rather, is in applying the results of these metalogical investigations. Metalogical results, by themselves, answer no questions about the logic of modality. They give us conditional answers only: if modal operators can be correctly analysed in so-and-so way, then they obey so-and-so system of modal logic. We must consider whether they may indeed be so analysed; and then we are doing metaphysics, not mathematics (*On the Plurality of Worlds* 17).

This quote illustrates two critical components of Lewis' philosophy. The first is his view that depending on the kind of logic, some kinds of entities are better suited than others to play theoretical roles; this is undoubtedly true. For example, existing entities are better suited than non-existing entities to bind objectual variables within classical logic. This is because within classical logic, the quantifiers quantify over existing objects. Lewis believes that in modal logic, there are certain entities better suited to play the theoretical role of a possible world than others. He believes these are also objects that must properly be said to exist. These existing objects are called *possible worlds* and *possible individuals*.

The second component this quote illustrates is that modal realism is meant to solve specific problems. Modal realism is meant to give us the ability to answer questions regarding the logic of modality. Thus, the purpose of modal realism is to provide us with a metaphysical picture that can answer questions such as: whether such and such a system represents the laws of modality; what makes sentences in our modal logics true; what makes our inferences valid or invalid; etc.

Lewis does not want entities that, for the purpose of heuristic guidance, may be considered possible worlds that are unable to determine the truth of modal propositions. An easier way of thinking about the purpose of modal realism is to explain what makes sentences like: ‘it was possible for Hillary Clinton to win the election’ true, even though it is false that Hillary Clinton won.

The explicit definition of modal realism is: there is no possible world or possible individual that has a lesser existential status than the world we live in or any of the individuals contained in it (*On the Plurality of Worlds* 3). There are two technical concepts at work here, ‘possible worlds’ and ‘possible individuals’.

Lewis’ general definition for a possible world is “the mereological sum of all the possible individuals that are parts of it” (*On the Plurality of Worlds* 69). Similarly, the general definition for a ‘possible individual’ is that it consists of parts of possible worlds (*On the Plurality of Worlds* 69, 70, 211). These definitions are only provisional and will be further developed in Section 3.2.

## **Section 2: Reductionism**

To begin, I explain the metaphysical and logic components of Lewis’ view that allow it to be considered reductive. This section explains what a reductive account of modality looks like and why such an account is desirable.

Lewis argues that one of the main advantages of his theory over competing theories is that it provides a reductive explanation of modality. Much of my exposition is focused on this

aspect of modal realism as it is the unique advantage modal realism has over other competing theories.

For an account of a modality to be reductive, the account must give an explanation of a modality that reduces to something else that does not contain any modalities. In other words, an explanation of modality is a successful reduction of a modality  $y$ , if  $y$  can be reduced to something  $x$ , where  $x$  does not contain any modal notions.

To explain what this means and why this is desirable, I consider two examples of non-reductive explanations of a modality. Imagine one wishes to explain what it means for an action  $a$  to be 'obligatory'. Furthermore, imagine one claims: ' $a$  is obligatory if and only if there is some possible world where  $a$  is obligatory'. This explanation is both non-reductive and unhelpful. It is non-reductive because the explanation of what it means for  $a$  to be obligatory contains the deontic modality 'obligatory' and hence fails to reduce the modality 'obligatory'. More importantly, by failing to reduce the modality 'obligatory', the explanation 'there is some possible world where  $a$  is obligatory' fails to explain what 'obligatory' actually means. Hence, this explanation is a useless explanation of what it means for something to be obligatory.

Another example of a non-reductive explanation is: 'possibly  $p$  is true if and only if there is a possible world where  $p$  is true'. The explanation is non-reductive because the explanation of what it means for 'possibly  $p$ ' to be true contains the modality 'possible' in the phrase possible world. This is also a useless explanation for what it means for 'possibly  $p$ ' to be true because it

does not explain what a possible world is. The primary purpose of modal realism is to give a reductive and useful explanation of possible worlds<sup>1</sup>.

A reductive explanation of modality is one that explains modalities without taking any modalities as primitive, or in other words, without including any modal notions in the explanation of modality (Sider 184). Unfortunately, the pool of examples I can draw on to explain this concept is quite small, as it is typically thought that Lewis' modal realism is the only theory that provides a successful reduction of modality. As Ted Sider states: "Hard as they are to accept, only Lewisian possible worlds allow a non-circular analysis of possibility and necessity" (Sider 192). Thus, to explain what a reductive theory of modality looks like it is simplest to explain Lewis' view.

### **Section 3: The Metaphysics of Modal Realism**

This section will explain the metaphysical aspects of modality that pertain to Lewis' reductive analysis of modality.

#### **3.1 The Actual World**

To begin understanding the metaphysical aspects of Lewis' view, it is best to start with Lewis' conception of the actual world. For Lewis, 'actual' operates as an indexical (*On the Plurality of Worlds* 92). Like 'I', whose referent changes depending on its utterer, the referent of 'actual' changes depending on where one is uttering it. If Thomas Nagel says, 'I am Thomas Nagel' then it is true because 'I', when uttered by Nagel, refers to Nagel. However, if I say: 'I am

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<sup>1</sup> Not all things require a reductive explanation in order to be useful; any reductive explanation will eventually bottom out at a primitive which cannot be given a further reductive explanation.

Thomas Nagel', it is false, because 'I' when uttered by me refers to me, and I am not Thomas Nagel. Similarly, Lewis believes that the reference of 'actual world' is determined by the world that the speaker of that utterance exists in. For example, for person *a* in world 1, world 1 is the actual world and for person *b* in world 2, world 2 is the actual world. The referent of 'actual' is determined by the worldly context in which it is uttered. For Lewis, the actual world in this context is the world we live in and actual individuals are the individuals contained in it. Thus, given that Lewis believes that all possible worlds and all possible individuals exist, Lewis needs a way to generate the possible individuals and possible worlds that are separate from the actual individuals found in the actual world. In order to generate individuals, Lewis methodologically, starts with the parsimonious reality that contains only the actual world and the actual individuals contained in it. He then outlines what he calls the principle of unrestricted mereological composition (UnMerComp).

### **3.2 Possible Individuals: Anything Generated by the UnMerComp**

Regarding possible individuals, Lewis claims: "My modal realism provides possible individuals simply as the proper parts of possible worlds; for instance, small parts, such as people" (*On the Plurality of Worlds* 148). Hence, the first thing that Lewis needs is a way to generate the individuals that are the parts of possible worlds; he does this through his principle of unrestricted mereological composition (or UnMerComp).<sup>2</sup>

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<sup>2</sup> My usage of 'generating' may incorrectly imply some sort causal account of how these possible individuals & worlds are created. This is incorrect. Lewis is attempting to give an explanation as to what kinds of individuals exist and what kinds of individuals do not exist. Thus, if one prefers, one may replace my usage of 'generating' with 'expressing'.

**UnMerComp:** “any old class of things has a mereological sum. Whenever there are some things, no matter how disparate and unrelated, there is something composed of just those things.” (*On the Plurality of Worlds* 211)

For example, if there is some section of reality that contains Saul Kripke and a different section of reality that contains David Lewis, then there is a mereological sum composed of Saul Kripke and David Lewis. The pair of David Lewis and Saul Kripke are a possible individual.

As Lewis says: “I really do mean absolutely unrestricted— for instance, I see no bar to composition of sets with individuals, or particulars with universals, or cats with numbers.” (*On the Plurality of Worlds* 212). This implies that there are an infinite number of possible individuals. Thus, the definition of a possible individual is as follows:

**Definition for a Possible Individual:** Possible individuals are individuals generated from the UnMerComp.

There are four things to keep in mind regarding Lewis’ UnMerComp. The first is that the UnMerComp does not, by itself, generate possible worlds. This is the case because some possible individuals are composed of parts, and the parts themselves can be described as possible individuals (*On the Plurality of Worlds* 91), and some possible individuals are not composed of parts of individuals (*On the Plurality of Worlds* 94). Hence, some individuals can be made up of more fundamental possible individuals. For example, an individual, say a human, can be made up of more fundamental individuals, for example an atom, which can also be made up of some other more fundamental individuals. Similarly, a possible human can be made up of possible atoms

that are made up of more fundamental possible individuals. This is why the UnMerComp generates *individuals* and not *worlds*; not all collections of individuals are considered worlds. Hence, one can think of a possible world as a special kind of possible individual.

The second thing to keep in mind, is that individuals do not overlap, in the sense that an individual such as Saul Kripke is not identical to something in another world. Saul Kripke is only identical to one person, namely himself, in one world. There can, however, exist two duplicates of Saul Kripke. Regarding duplicates, Lewis claims: “we can say that two things are duplicates if (1) they have exactly the same perfectly natural properties, and (2) their parts can be put into correspondence in such a way that corresponding parts have exactly the same perfectly natural properties, and stand in the same perfectly natural relations” (*On the Plurality of Worlds* 61). In other words,  $x$  is a duplicate of  $y$  if and only if  $x$  and  $y$  share all of the same properties except for the properties that are essential to their identity, if such properties exist.

The third is that while two possible individuals, for example Saul Kripke and David Lewis, are able to coexist in the same world, they cannot coexist in the same spatiotemporal position; for Lewis, this would result in an impossibility (*On the Plurality of Worlds* 88).

The fourth is that the UnMerComp is simply a statement of a metaphysical view. It does not imply that we do or even could know all of the worlds that exist. This is evident from the fact that Lewis does not preclude the existence of alien worlds/individuals. Lewis claims: “I defined an alien natural property as one that is not instantiated by any part of this world, and that is not definable as a conjunctive or structural property build up from constituents that are all instantiated by parts of this world” (*On the Plurality of Worlds* 58). He then states: “Anything that instantiates an alien property is an alien individual; any world within which an alien property

is instantiated is an alien world” (*On the Plurality of Worlds* 91). Another way of saying this is that alien individuals either contain, or are made up of, properties that are not found in the actual world.

There are two key points to keep in mind regarding the alien properties instantiated in alien individuals. The first is that Lewis claims: “Perhaps, as Armstrong has suggested in discussion, I should have added a third clause: ‘. . . and that is not obtainable by interpolation or extrapolation from a spectrum of properties that are instantiated by parts of this world’” (*On the Plurality of Worlds* 91). Lewis also claims: “We can’t get the alien possibilities just by rearranging non-alien ones” (*On the Plurality of Worlds* 92). This implies that the inhabitants in the actual world cannot infer anything non-trivial about alien properties or alien possibilities.<sup>3</sup> Thus, non-trivial knowledge about alien properties is impossible for people in the actual world.

The second point about alien properties instantiated in alien individuals is that Lewis claims: “It is reasonable to think there are some such possibilities; and I do not see how we could have words for the alien properties they involve.” (*On the Plurality of Worlds* 159). Given that we do not have words for alien properties, there are certain descriptive elements regarding alien individuals that are epistemically inaccessible to us.

The reason why alien individuals and worlds are important is that, in this context, they highlight the fact that the UnMerComp does not contain modal notions. One may interpret Lewis as claiming something along the lines of: “the UnMerComp allows for the possibility of alien worlds”; as such, one could argue that Lewis’ account cannot be reductive, as it contains the

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<sup>3</sup> By non-trivial inferences, I mean inferences that have more cognitive significance than: If there is an alien possibility, then there is an alien possibility.

modal notion of ‘possibility’. This interpretation, however, is incorrect. Lewis’ definition is: “Any old class of things has a mereological sum. Whenever there are some things, no matter how disparate and unrelated, there is something composed of just those things” (*On the Plurality of Worlds* 211). The UnMerComp does not preclude the existence of alien individuals, nor does it express the possibility of such individuals. Instead, the UnMerComp gives us the conditional: *if some alien individuals exist, then there is something composed of alien individuals*, and there are no modal notions contained in this conditional.

The key thing to keep in mind is that the UnMerComp does not include any modal notions. Thus, given that the UnMerComp does not include modal notions and the UnMerComp is what generates possible individuals, Lewis’ account of possible individuals does not contain any modal notions.

### **3.3 Possible Worlds: “a world is a maximal mereological sum of spatiotemporally interrelated things” (*On the Plurality of Worlds* 73).**

The next thing that Lewis needs is an account that can solve the two problems:

- 1) How to distinguish the kinds of possible individuals that are possible worlds from the kinds of possible individuals that are not possible worlds.
- 2) How to demarcate between individual possible worlds.

His solution comes in the form of *spatiotemporal interconnectedness*.

Lewis claims: “Whenever two possible individuals are spatiotemporally related, they are worldmates. If there is any distance between them - be it great or small, spatial or temporal - they are parts of one single world” (*On the Plurality of Worlds* 70). A spatiotemporal relation can be

seen as the two-place relation:  $x$  is spatiotemporally related to  $y$ . For example:  $x$  is in front of  $y$  or  $x$  was alive before  $y$ . Similarly, a relation analogous to a spatiotemporal relation can be seen as the two-place relation ' $x$  is analogously spatiotemporally related to  $y$ '. Lewis outlines four conditions a relation must meet in order to be considered a relation that is analogous to spatiotemporal relations:

- (1) "The relations are natural; they are not gruesome gerrymanders, not even mildly disjunctive" (*On the Plurality of Worlds* 75-76)
- (2) "They are pervasive: mostly, or perhaps without exception, when there is a chain of relations in the system running from one thing to another, then also there is a direct relation." (*On the Plurality of Worlds* 76)
- (3) "They are discriminating: it is at least possible, whether or not it happens at every world where the relations are present, that there be a great many interrelated things, no two of which are exactly alike with respect to their place in the structure of relations." (*On the Plurality of Worlds* 76)
- (4) They are external: they do not supervene on the intrinsic natures of the relata taken separately, but only on the intrinsic character of the composite of the relata." (*On the Plurality of Worlds* 76)

The key point here is that individuals are grouped into worlds through spatiotemporal relations or relations analogous to spatiotemporal relations. Lewis claims: "for any two possible individuals, if every particular part of one is spatiotemporally related to every particular part of the other that is wholly distinct from it, then the two are worldmates." (*On the Plurality of*

*Worlds* 70). Hence, if there are two individuals  $x$  and  $y$ , and  $x$  and  $y$  share some relations that are spatiotemporal or analogous to spatiotemporal relations, then  $x$  and  $y$  are grouped together and considered part of the same world. Conversely if  $x$  and  $y$  do not share any spatiotemporal relations nor any relations that are analogous to spatiotemporal relations, then the individuals are parts of different worlds.

Thus, Lewis' definition of a possible world is as follows:

**Definition of a possible world:** A possible world is: “a maximal mereological sum of spatiotemporally interrelated things”

(*On the Plurality of Worlds* 73)<sup>4</sup>.

From this we can understand how Lewis solves the two problems mentioned above.

**Problem 1:** How are the kinds of possible individuals that are possible worlds distinguished from the kinds of possible individuals that are not possible worlds?

**Answer:** Not every possible individual is a maximal mereological sum of spatiotemporally interconnected things but every possible individual that is a maximal mereological sum of spatiotemporally interconnected things is a possible world. In other words, if a mereological sum of things is not spatiotemporally interconnected, then it is not a possible world.

**Problem 2:** How are possible worlds demarcated?

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<sup>4</sup> For the sake of simplicity, I will leave out the idea of possible worlds also being maximal sums of things connected by relations analogous to spatiotemporal relations to keep my definition from being too wordy. However, Lewis does believe that possible worlds are either maximal sums of spatiotemporally interconnected things or maximal sums of things connected by relations analogous to spatiotemporal relations.

**Answer:** Every group of objects that share spatiotemporal relations with each other are a part of the same world, and if some object does not share any spatiotemporal relations or relations analogous to such relations to any objects in a world, then they are not part of the same world. Thus, each world is spatiotemporally isolated.

### **3.4 Two Counter Objections to Lewis' Account of Spatiotemporal Isolation**

It is important to address two counter objections to Lewis' account of spatiotemporal isolation.

The first is that Lewis' account of spatiotemporal isolation is a cost to Lewis' view as it precludes the intuitive possibility "that a world might possibly consist of two or more completely disconnected spacetimes" (*On the Plurality of Worlds* 71). That is because, for the modal realist, there is no world that contains two individuals that fail to have any spatiotemporal interconnectedness between one another (*On the Plurality of Worlds* 72). However, Lewis believes that in accounting for this possibility he would be forced to give up the reductive nature of his view. As he says: "Given a choice between rejecting the alleged possibility of disconnected spacetimes within a single world and (what I take to be the alternative) resorting to a primitive worldmate relation, I take the former to be more credible" (*On the Plurality of Worlds* 72). Hence, Lewis believes that giving up the reductive nature of modal realism incurs a greater cost than, at least, allowing for some intuitive possibilities.

The second objection can be seen in Lewis' account of relations that are analogous to spatiotemporal relations. The astute reader will notice that Lewis' third point in regards to relations that are analogous to spatiotemporal relations contains the modal notion 'possible'.

(3) “They are discriminating: it is at least *possible*, whether or not it happens at every world where the relations are present, that there be a great many interrelated things, no two of which are exactly alike with respect to their place in the structure of relations.”  
*(On the Plurality of Worlds 76).*

One may argue that Lewis' account fails to be reductive because this condition that explains what a possible world *is* includes the modal notion ‘possible’. This problem can easily be solved if we interpret the modality ‘possible’ found in the third condition, as follows:

(3)\* They are discriminating: there is at least one portion of reality, regardless of whether or not it happens at every portion where the relations are present, that there be a great many interrelated things, no two of which are exactly alike with respect to their place in the structure of relations.

The key part here is that this formulation gets rid of the modal notion *possible* by reducing it to a portion of reality. The reason it must be reduced to a portion of reality and not a possible world is because (3)\* is only one of four conditions that have to be met in order for certain kinds of relations to be considered ‘analogous to spatiotemporal relations’ and relations analogous to spatiotemporal relations are world-defining relations. Hence, a relation must meet all four conditions before being considered a relation analogous to a spatiotemporal relation.

The important thing to remember from this section is that Lewis’ account of spatiotemporal isolation determines which individuals generated from the UnMerComp are possible worlds. Essentially, every group of objects that share spatiotemporal relations with each other is a part of the same world, and if an object does not share either any spatiotemporal

relations, or any relations analogous to such relations, to some object in a world, then the object is not a part of that world. Hence, each world is spatiotemporally isolated from any other.

Keep in mind that because Lewis' account of spatiotemporal relations and relations analogous to spatiotemporal relations does not contain any modal notions, his explanation of possible worlds is reductive. This reductive account of 'possible worlds' is intended to be a benefit that comes with accepting modal realism.

#### **Section 4: Logic of Modal Realism**

I now turn to the logical aspects of modal realism that pertain to the reductive nature of Lewis' account. Broadly speaking, the logic that governs modal realism is counterpart theory. More specifically, the logic used in counterpart theory is Lewis' version of counterpart theory.

There are four predicates and eight postulates that govern Lewis' counterpart theory.

The eight postulates which govern the counterpart relation are as follows:

- Predicate 1:**             $Wx$   
                                   (x is a possible world)
- Predicate 2:**             $Ixy$   
                                   (x is in possible world y)
- Predicate 3:**             $Ax$   
                                   (x is actual)
- Predicate 4:**             $Cxy$   
                                   (x is a counterpart of y)

(“Counterpart Theory and Quantified Modal Logic” 113)

The eight postulates which govern the counterpart relation are as follows:

- Postulate 1:**  $\forall x \forall y (Ixy \supset Wy)$   
(Nothing is in anything except a world)
- Postulate 2:**  $\forall x \forall y \forall z (Ixy \ \& \ Ixz \ .\supset \ y = z)$   
(Nothing is in two worlds)
- Postulate 3:**  $\forall x \forall y (Cxy \supset \exists z Ixz)$   
(Whatever is a counterpart is in a world)
- Postulate 4:**  $\forall x \forall y (Cxy \supset \exists z Iyz)$   
(Whatever has a counterpart is in a world)
- Postulate 5:**  $\forall x \forall y \forall z (Ixy \ \& \ Izy \ \& \ Cxz \ .\supset \ x = z)$   
(Nothing is a counterpart of anything else in its world)
- Postulate 6:**  $\forall x \forall y (Ixy \supset Cxx)$   
(Anything in a world is a counterpart of itself)
- Postulate 7:**  $\exists x (Wx \ \& \ \forall y (Iyx \equiv Ay))$   
(Some world contains all and only actual things)
- Postulate 8:**  $\exists x Ax$   
(Something is actual)

(“Counterpart Theory and Quantified Modal Logic” 114)

One can view counterpart theory as a logic that reduces modal logic to classical predicate logic. It does this by adding new predicates and expanding the domain of quantification in order to quantify over non-actual individuals (possible individuals and possible worlds).

Lewis is interested in two kinds of sentences, sentences that take the form: ‘Possibly x’ and sentences that take the form: ‘x is possibly y’. To make this difference clear, consider the following sentences:

**Sentence 1:** Possibly, a dog is a cat

$$\diamond \exists x (Dx \ \& \ Cx)$$

**Sentence 2:** A dog is possibly a cat

$$\exists x (Dx \ \& \ \diamond Cx)$$

The first sentence says that it is possible for something to be a dog and a cat. In counterpart theory, this sentence is true if and only if, in some world, there is an object that is both a cat and a dog. If there is no possible world where something is both a cat and a dog, then the sentence is false. Lewis classifies these kinds of sentences as *De Dicto* sentences.

The second sentence is quite different. The second sentence says that there is something that is actually a dog, that could have possibly been a cat. Suppose we know this sentence is true because we know that Henry the dog exists in the actual world and Henry could have been a cat in another world. In counterpart theory the sentence: ‘Henry the dog exists in the actual world and could have been a cat’ is true if and only if Henry in the actual world has a counterpart in a possible world who is a cat. Lewis classifies these kinds of sentences *De Re* sentences. Lewis says: “Modality *de re*, the potentiality and essence of things, is quantification over possible individuals” (*On the Plurality of Worlds* 8). This means that *De Re* modality need not be restricted to what is possible at a given world.

The notion of *counterparts* is the novelty in Lewis’ view. It centers around a notion of similarity, insofar as a counterpart of Lewis in world  $w$  is an object in  $w$  that is similar enough to

Lewis and which is at least as similar to Lewis as are other objects in  $w$  (Sider 193). Thus, Lewis is possibly a hockey player is true in world  $w$  if and only if there is some possible world, namely  $w'$ , that contains a counterpart of Lewis, and Lewis' counterpart has the property 'being a hockey player'. In order for something  $x$  in world  $w'$  to be a *counterpart* of Lewis in world  $w$ , there must be no object in  $w'$  that is more similar to Lewis in  $w$  than  $x$ .

There are three reasons for why counterpart theory is reductive. First, aside from the new predicates that contain the concepts 'is a possible world' or 'is a counterpart', counterpart theory reduces to classical predicate logic. If classical predicate logic, aside from the new predicates, does not contain any modal primitives, then the reduction is successful.

Second, counterpart theory reduces the concept of possible worlds to the existing worlds found in modal realism.

Third, counterpart theory reduces the notion of 'possible' in sentences that express the possible properties an individual may have, using counterpart relations. For example, a sentence such as: 'F is a possibility for y' translates into: 'There is an existing world  $w$  that contains a counterpart of y, who is F'. If the counterpart relation and the concept of similarity do not contain any modal notions, the counterpart relation is reductive. This essay will assume that counterpart theory is successfully reductive.<sup>5</sup> If this is granted, then counterpart theory is reductive and hence, the logic of modal realism is reductive.

In short, the logical aspects of Lewis' account succeed because it analyses the notion of a possible world within the framework of modal realism. However, should specific logical aspects

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<sup>5</sup> A more substantial defense can be seen in "Counterpart Theory and Quantified Modal Logic" by David Lewis.

of Lewis' theory fail to be successfully reductive, he need only create a different logical account that relies on the entities generated from the UnMerComp and entities grouped together by his account of spatiotemporal relations as the entities we are quantifying over, using whatever logic we choose. As he claims: "If this language of boxes and diamonds proves to be a clumsy instrument for talking about matters of essence and potentiality, let it go hang. Use the resources of modal realism directly to say what it would mean for Humphrey to be essentially human, or to exist contingently" (*On the Plurality of Worlds* 13).

#### **4.1 Possible Objections to Counterpart Theory**

This subsection addresses a traditional objection to counterpart theory, the objection being: the similarity relation found in the counterpart relation involves a great amount of indeterminacy. For example, whether or not a cat is similar enough to a human to be considered the counterpart of a human. Regarding indeterminacy, Lewis claims:

Like any relation of comparative overall similarity, it is subject to a great deal of indeterminacy (1) as to which respects of similarity and difference are to count at all, (2) as to the relative weights of the respects that do count, (3) as to the minimum standard of similarity that is required, and (4) as to the extent to which we eliminate candidates that are similar enough when they are beaten by competitors with stronger claims. ("Postscripts to 'Counterpart Theory and Quantified Modal Logic'" 42)

This issue looms even larger as Lewis admits that there may be no determinate right answers about what is possible for individuals:

I think there is a great range of cases in which there is no determinate right answer to questions about representation de re, and therefore no right answer to questions about modality or counterfactuals de re. Could Hubert Humphrey have been an angel? A human born to different parents? A human born to different parents in ancient Egypt? A robot? A clever donkey that talks? An ordinary donkey? A poached egg? Given some contextual guidance, these questions should have sensible answers. There are ways of representing whereby some worlds represent him as an angel, there are ways of representing whereby

none do. Your problem is that the right way of representing is determined, or perhaps underdetermined, by context - and I supplied no context (*On the Plurality of Worlds* 251).

Thus, the similarity relation (or counterpart relation) is subject to a large amount of indeterminacy. A popular reason for rejecting counterpart theory is precisely that the counterpart relation contains a great deal of indeterminacy. However, if modal realism is correct, then this no longer constitutes a good reason to reject counterpart theory. There are two reasons for this.

First, no other logic has been developed to talk about modalities within the framework of modal realism. Thus, assuming modal realism is correct, one ought to accept counterpart theory, unless one provides a different logic within the framework of modal realism that either contains less indeterminacy than Lewis' counterpart theory or does away with Lewis counterpart relations. If modal realism is correct and no logic other than counterpart theory works within the framework of modal realism, then it is unreasonable to reject counterpart theory on the grounds of indeterminacy.

Second, counterpart relations only come into play if the following two conditions are met:

**Condition 1:** The sentence expresses what is possible for an individual.

**Condition 2:** We are limiting the domain of what is possible for an individual.

It is critical to understand that similarity relations are not used when considering the widest domain of *De Re* possibility. Lewis claims: "In the broadest sense, all possible individuals without exception are possibilities for me." (*On the Plurality of Worlds* 234) and "I say that any possible individual is a possibility" (*On the Plurality of Worlds* 230). When referring to the broadest domain of possibility, one can do away with the notion of similarity and simply state: 'it is possible for a to have some property P iff there is some individual x that has the property P'.

Keep in mind that in counterpart theory ‘possible worlds’ are used as predicates.

**Postulate 1:**  $\forall x\forall y (Ixy \supset Wy)$

(Nothing is in anything except a world)

(“Counterpart Theory and Quantified Modal Logic” 114)

The idea that a possible world is a predicate for certain kinds of objects is in line with modal realism. The UnMerComp generates possible individuals, which in counterpart theory are the objects that are quantified over. Lewis’ account of spatiotemporal interconnectedness specifies which possible individuals are considered possible worlds, which in counterpart theory can be seen as explaining what the predicate ‘is a possible world’ means.

### **Section 5: Brief Summary**

In short, there are three things Lewis uses to create a reductive account of modality.

- 1) The UnMereComp, to generate possible individuals,
- 2) his account of spatiotemporal relations to specify which possible individuals are possible worlds and,
- 3) counterpart theory, or more specifically, a logic that uses the reductive elements of modal realism to explain both what it means for something to be possible for an individual, and what it means for something to be possible for a world.

I refrain from giving a more substantial defense of Lewis' reduction; more substantial defenses can be found in both Ross Cameron’s paper “Why Lewis Succeeds in its Reductive

Ambitions” and Ted Sider's paper “Reductive Theories of Modality”. This thesis assumes that modal realism provides a successful reduction of modality.

The next two sections discuss some of the metaphysical and logical aspects of Lewis' view that follow from the reductive aspects of his view.

## **Section 6: Trans-World Individuals**

This section will illustrate Lewis' commitment towards trans-world individuals. Trans-world individuals are individuals that are “composed of distinct parts in non-overlapping worlds” (*On the Plurality of Worlds* 203). In other words, trans-world individuals contain parts that are present in two or more non-overlapping worlds. By ‘non-overlapping worlds’ Lewis means worlds that do not share any common parts.

I begin this section by highlighting three quotes that explain Lewis' view on trans-world individuals.

### **6.1 Lewis' Commitments Regarding Trans-World Individuals**

Lewis claims:

I do not deny the existence of trans-world individuals, and yet there is a sense in which I say that they cannot possibly exist. As should be expected, the sense in question involves restricted quantification...It is possible for something to exist iff it is possible for the whole of it to exist. That is, iff there is a world at which the whole of it exists. That is, iff there is a world such that, quantifying only over parts of that world, the whole of it exists. That is, iff the whole of it is among the parts of some world. That is, iff it is part of some world - and hence not a trans-world individual. Parts of worlds are *possible* individuals; trans-world individuals are therefore *impossible* individuals (*On the Plurality of Worlds* 211).

Two critical ideas are expressed in this quote. The first is that Lewis does *not* deny the existence of trans-world individuals. Trans-world individuals in Lewis' sense are individuals that *wholly* exist in more than one world. The second idea is that if we define a possible individual as a part of a possible world, then we are restricting the domain of possible individuals that we are quantifying over. Trans-world individuals are impossible only if they are defined as something that wholly exists as a part of a possible world. This leaves us with the question: what makes trans-world individuals possible if we do not restrict the domain of possibility? Lewis' answer is seen in the following quote:

We could say that an individual exists at a world iff, quantifying only over parts of that world, some part of that individual exists - that way, the trans-world individuals would count as possible. I claim that mereological composition is unrestricted: any old class of things has a mereological sum. Whenever there are some things, no matter how disparate and unrelated, there is something composed of just those things. Even a class of things out of different worlds has a mereological sum. That sum is a trans-world individual. (*On the Plurality of Worlds* 211)

This quote illustrates both why Lewis believes that trans-world individuals exist and how to express their possibility. Trans-world individuals exist because classes of things out of different worlds have a mereological sum: if an individual is generated from the UnMerComp, then the individual exists. Lewis also says that we can express the possibility of a trans-world individual's existence at a world by quantifying over a part of a world where a part of a trans-world individual exists. For example, Lewis believes that if there is a part of a world where a trans-world individual exists, for example the mereological sum of dogs, we can say the mereological sum of dogs exists at that world. This implies that there is some sense in which we can claim that the existence of a trans-world individual is possible at a world.

Lewis then goes on to state: “The simple principle of absolutely unrestricted composition should be accepted as true” (*On the Plurality of Worlds* 212). And to clarify what he means by unrestricted composition, he claims in a footnote: “I really do mean absolutely unrestricted— for instance, I see no bar to composition of sets with individuals, or particulars with universals, or cats with numbers.” (*On the Plurality of Worlds* 212).

This quote explains that there are no limitations regarding the kinds of individuals that are generated from the UnMerComp; anything is compossible with anything. The implication is that even if two things from two different worlds cannot belong to a single world, they can belong to a single individual. Thus, Lewis is committed to the existence and possibility of trans-world individuals.

## **6.2 Trans-world Identity and Trans-world Causation**

The next thing to get clear on is what Lewis denies regarding trans-world individuals. There are two primary things that he denies: *trans-world causation* and *trans-world identity*.

Trans-world causation is the idea that a part of one world can affect a part of another. Lewis claims: “there isn't any trans-world causation” (*On the Plurality of Worlds* 80). This is because possible worlds are spatiotemporally isolated from one another. If possible worlds are spatiotemporally isolated from one another, then they are causally isolated from one another. The implication of this is that although there are trans-world individuals, no part of a trans-world individual that is present in one world can affect a different part that is a part of a different world. For example, imagine there is a trans-world individual *a* that is composed of parts *x* and *y*. If *x* is

part of world 1 and  $y$  is part of world 2,  $x$  does not affect  $y$ . Thus, Lewis holds that while trans-world individuals exist, trans-world causation is impossible.

Trans-world identity is the idea that two possible worlds share a common part (*On the Plurality of Worlds* 54). An individual has trans-world identity iff, there is an individual  $x$  in world 1 and an individual  $y$  in world 2 and  $x$  and  $y$  are identical. Lewis' denial of trans-world identity means that there is nothing in one world that is identical to something in another world. The implication of an individual having trans-world identity is that the worlds overlap, insofar as two different worlds share a common part. As Lewis claims "trans-world identity, in the sense of overlap of worlds, is to be rejected" (*On the Plurality of Worlds* 199).

### **6.3 Possible Objection**

One may argue that given that Lewis accepts the existence of trans-world individuals, he ought to accept trans-world identity. This is because trans-world identity arises when two worlds have something in common, and if there is a trans-world individual named  $a$  that has a part that exists in world 1 and a part that exists in world 2, then world 1 and world 2 have something in common, namely the existence of  $a$  in both worlds. Given that modal realism allows for  $a$  to exist in world 1 and world 2, modal realism is committed to trans-world identity. In order to show why this objection is misguided, I draw on an analogy Lewis uses to explain trans-world individuals.

### **6.4 Trans-World Individuals are Analogous to Perduring Individuals**

Lewis believes that "Perdurance through time is analogous to the 'trans-world identity'" (*On the Plurality of Worlds* 203). Lewis explains the concept of perdurance through the following biconditional: "Something perdures iff it persists by having different temporal parts, or

stages, at different times, though no one part of it is wholly present at more than one time” (*On the Plurality of Worlds* 202). The example Lewis gives to clarify perdurance is: “Perdurance corresponds to the way a road persists through space; part of it is here and part of it is there, and no part is wholly present at two different places (*On the Plurality of Worlds* 203). From this we are meant to infer that even though the road is not wholly present in two different places, the road (or parts of it) exists in two different places. Thus, while it is false to say that a road fully exists in two different places, we can still say that the road exists in two different places.

Another example of something that perdures is a human being. For Lewis, a human being partly exists in temporal stages. For example, suppose that Kripke exists only at times  $t1$ ,  $t2$  and  $t3$ . Lewis would claim that Kripke partly exists at  $t1$ , partly exists at  $t2$  and partly exists at  $t3$ . The whole person named Kripke simply is the parts that exist at  $t1$ ,  $t2$  and  $t3$ .

Similarly, Lewis believes that a trans-world individual can partly exist in world 1, partly exist in world 2 and partly world 3. I will discuss Lewis’ view on the whole of trans-world individuals at the end of this section.

The important point to focus on is that perdurance theory utilizes two different notions of existence, *partial existence* and *whole existence* and hence, the meaning of ‘exists’ can be ambiguous. This means that, in the context of perdurance theory, the meaning of ‘exists’ is ambiguous. To make this clear, imagine a possible world  $w$  where Kripke exists only at times  $t1$ ,  $t2$  and  $t3$ . In this possible world, the sentence: ‘Kripke exists at  $t1$  in  $w$ ’ can be true or false depending on how we interpret the meaning of *exists*. If we interpret the meaning of ‘exists’ as partially exists, then the sentence is true as Kripke only partially exists at  $t1$  in  $w$ . However, if we interpret the meaning of ‘exists’ as ‘wholly exists’ then the sentence is false as Kripke’s whole

existence is the sum of his partial existences in  $t1$ ,  $t2$  and  $t3$  within world  $w$ . Hence, in the sentence ‘Kripke *exists* at  $t1$  in  $w$ ’ the meaning of ‘exists’ is ambiguous as the truth or falsity of the sentence depends on whether we interpret ‘exists’ as partially exists or wholly exists.

The key point to keep in mind is that ‘exists’ is ambiguous when referencing individuals that perdure. Given that ‘exists’ can be ambiguous when referring to individuals that perdure through time, and given that Lewis believes that perduring individuals are analogous to trans-world individuals, ‘exists’ ought to be ambiguous when referring to trans-world individuals. Lewis accepts this ambiguity: “I distinguished three ways of ‘being in a world’: (1) being wholly in it, that is, being part of it; (2) being partly in it, that is, having a part that is wholly in it; and (3) existing from the standpoint of it” (*On the Plurality of Worlds* 96).

Thus, the ambiguity of the meaning of ‘exists’ arises in the context of possible individuals. A sentence such as: ‘individual  $a$  exists in world 2 and world 1’ is ambiguous because we can interpret the sentence as 1)  $a$  partly exists in world 1 and world 2 or 2)  $a$  wholly exists in world 1 and world 2. If we say that  $a$  partially exists in world 1 and 2, then the sentence is true because the whole of  $a$  does not exist in either world. If we say that  $a$  wholly exists in worlds 1 and 2, then the sentence is false because there is nothing that wholly exists in more than one world.

## **6.5 A Commitment to Trans-world Individuals is not a Commitment to Trans-world**

### **Identity**

It should be clear where the counter objection goes wrong. The objection was:

If there is a trans-world individual named *a* that has a part that exists in world 1 and a part that exists in world 2, then world 1 and world 2 have something in common, namely that *a* exists in world 1 and world 2. Thus, given that modal realism allows for *a* to exist in world 1 and in world 2, modal realism is committed to trans-world identity.

Lewis can argue that the flaw with this objection is that it plays on the ambiguity of ‘exists’. The sentence: ‘*a* exists in world 1 and world 2’ is true if we interpret ‘exists’ as ‘partially exists’. The sentence is true because *part of a wholly* exists in world 1 and *part of a wholly* exists in world 2. As such, individual *a partially* exists in world 1 and *partially* exists in world 2. The part that exists in world 1 is not identical to the part that exists in world 2, nor is there anything in world 1 or world 2 that is identical to the whole individual *a*. If we interpret ‘exists’ as ‘partially exists’, then trans-world individuals do not have trans-world identity because there is nothing that wholly exists in one world that is identical to something that wholly exists in another world. If, in the sentence: ‘*a* exists in world 1 and world 2’ we interpret ‘exists’ as ‘wholly exists’, the sentence is false, *a* does not wholly exist in world 1 or world 2. Thus, because a trans-world individual cannot wholly exist in two worlds, there is no trans-world identity. Trans-world individuals do not imply that two worlds to share a common part.

One of the important points of Lewis’ discussion is his views on the whole existence of trans-world individuals. He says: “Perdurance, which I favour for the temporal case, is closer to the counterpart theory which I favour for the modal case; the difference is that counterpart theory concentrates on the parts and ignores the trans-world individual composed of them” (*On the Plurality of Worlds* 203). Thus, Lewis does not deny the whole of a trans-world individual, he merely ignores it.

In short, there are three important points regarding Lewis' view of trans-world individuals.

First, Lewis accepts the existence and possibility of trans-world individuals. The reason that trans-world individuals exist is because they are generated from the UnMerComp. The reason we can consider trans-world individuals as possible at a world is: "an individual exists at a world iff, quantifying only over parts of that world, some part of that individual exists" (*On the Plurality of Worlds* 211).

Second, Lewis denies trans-world causation and trans-world identity. He denies trans-world causation because his view of possible worlds does not allow for it. He denies trans-world identity because he denies the possibility that a trans-world individual can wholly exist in two different worlds.

Third, Lewis ignores the whole existence of trans-world individuals.

### **Section 7: Impossibility**

The final part of Lewis' view that I outline is Lewis' view of impossibility. Modal realism claims that possible worlds and possible individuals have the same existential status as the actual world and the individuals contained in it. For Lewis, impossibilities are simply "what is the case at no worlds" (*On the Plurality of Worlds* 7). When Lewis claims that what is impossible is the case at no worlds, the best way to understand this is that: something is impossible if and only if, it does not exist in any world that has the same existential status as the actual world. This understanding of 'impossibility' is restricted because if the biconditional: 'something is impossible if and only if it does not exist in any world that has the same existential

status as the actual world' were true, then, in modal realism trans-world individuals would be impossible. But Lewis accepts the possibility of trans-world individuals. Hence, the correct way of understanding Lewis' view of impossibility is: something is impossible iff it does not exist. This is what Lewis is metaphysically committed to regarding possibility and impossibility.

Lewis is not very explicit in regards to the limits of what is possible or impossible, although, he argues that a true contradiction i.e. a sentence where  $P \ \& \ \sim P$  are both true, is an impossibility. As Lewis claims: "there is no subject matter, however marvellous, about which you can tell the truth by contradicting yourself" (*On the Plurality of Worlds* 7). To defend this, Lewis asks us to imagine we were told of a mountain where  $P$  and  $\sim P$  are both true. Next, he asks us to imagine ourselves claiming that: 'on the mountain  $P$ , and, on the mountain, not  $P$ ' (*On the Plurality of Worlds* 7).

The difference between being told: 'there is a mountain where  $P$  and  $\sim P$  are both true' and ourselves claiming: 'on the mountain  $P$ , and, on the mountain, not  $P$ ' is that, when we are told 'there is a mountain where  $P$  and  $\sim P$  are true' we are told that there is a place where there exists a true contradiction, and when we claim: 'on the mountain  $P$ , and, on the mountain, not  $P$ ,' we are simply contradicting ourselves. However, as Lewis points out, the truth values in both sentences are nonetheless the same. The upshot here is that Lewis believes that claiming that there is *someplace* where  $P$  and  $\sim P$  is true is the same claim as one claiming that  $P$  and  $\sim P$ . Lewis concludes: "there is no subject matter, however marvellous, about which you can tell the truth by contradicting yourself. Therefore, there is no mountain where contradictions are true" (*On the Plurality of Worlds* 7). Lewis intends for us to infer that saying 'it is possible for there to be a true contradiction' (i.e. it is possible for  $P$  and  $\sim P$  to be true), is the same as contradicting

yourself. This is because in the context of modal realism, ‘possibly P and  $\sim$ P’ is true if and only if there is some existing world, where P and  $\sim$ P is true. If something is a possible mountain, then it is an existing mountain and if something is an existing mountain, it is also a possible mountain, since everything that exists is possible. Thus, if there is no existing mountain where P and  $\sim$ P is true, then there is no possible mountain where P and  $\sim$ P is true.

We can reasonably infer that Lewis believes we can replace ‘existing mountain’ with ‘existing place’ as this is what is needed to reach the conclusion: “there is no subject matter, however marvellous, about which you can tell the truth by contradicting yourself” (*On the Plurality of Worlds* 7). If there is no existing place where P and  $\sim$ P is true, then, assuming modal realism is true, one cannot truthfully contradict oneself. If one considers the entirety of Lewis’ plurality of worlds to be a place, then saying that there is no existing place where P and  $\sim$ P is true, is the same as saying that there is no existing thing that contains a true contradiction. In other words, there is no possible individual that is contradictory. Thus, we can also infer that if something is contradictory, then it is impossible.

In short, Lewis has two commitments regarding impossibility. First, anything that does not exist is impossible. Second, true contradictions are impossible.

### **Section 8: Quick Summary**

This thesis thus far has been largely expository and before moving on to the more critical aspect I wish to summarize the seven main points that have been discussed so far.

First, modal realism is the ontological thesis that every possible world has the same existential status as the actual world and every possible individual has the same existential status as the individuals within the actual world.

Second, modal realism gives a successful reduction of modality. This means that every modality  $x$  can be reduced to something  $y$  where  $y$  contains no modality.

Third, possible individuals are generated from the UnMerComp. The UnMerComp claims: “any old class of things has a mereological sum. Whenever there are some things, no matter how disparate and unrelated, there is something composed of just those things. Even a class of things out of different worlds has a mereological sum” (*On the Plurality of Worlds* 211).

Fourth, possible worlds are grouped together by spatiotemporal relations: “a world is a maximal mereological sum of spatiotemporally interrelated things” (*On the Plurality of Worlds* 73). Possible worlds are merely a kind of possible individual. The easiest way to understand how the metaphysics of modal realism is meant to work is that the UnMerComp generates possible individuals and spatiotemporal relations and groups them together into worlds.

Fifth, the logic that governs modal realism is a form of counterpart theory. A sentence interpreted *De Dicto*, such as: ‘Possibly a dog is a cat’ is true if and only if in some possible world there is something that has the property *is a dog* and the property *is a cat*. A sentence interpreted *De Re*, such as ‘this dog is possibly a cat’, is true if and only if, this dog has a counterpart that has the property of *being a cat*.

Sixth, Lewis believes in the *existence* and *possibility* of trans-world individuals. Trans-world individuals are possible individuals that are composed of parts that exist in different

worlds. This does not imply a commitment to trans-world causation (an individual in one world has a causal connection to an individual in another) nor does it imply a commitment to trans-world identity (two worlds share a common individual).

Seventh, Lewis believes that true contradictions are impossible because nothing is contradictory.

### **Section 9: Four Costs of Modal Realism**

In my introduction I claimed that Lewis defends modal realism on the basis of a cost benefit analysis. The greatest benefit is its reduction to non-modal elements and the greatest cost is the controversial ontology that comes with it. I argue below that there are four important costs that come with accepting modal realism.

The first cost is that Lewis' counterpart theory does not capture the metaphysics of modal realism. As such, Lewis' counterpart theory must be revised if it intends to capture every modal fact that is derivable from modal realism

The second cost is that modal realism creates epistemic limitations that prevent humans from answering specific questions surrounding the laws of modality. Humans are unable to determine whether or not some kinds of entities exist and because of this, humans are unable to know whether or not some kinds of entities are possible.

The third cost is that Lewis' conception of possible worlds does not properly reflect the common notion: *the ways the actual world could be*. I will argue that the modal realist is committed to the idea that there are more ways that the actual world could be than there are possible worlds because within modal realism, the sentence 'the actual world is possibly not a

possible world' is true. Thus, if one is a modal realist, one must use a different kind of entities to capture all of the modal fact's ordinary notion: *the ways the actual world could be*.

The fourth cost is that modal realism is unable to resolve a number of debates between modal realists about the nature and logic of possible worlds. This is because Lewis does not reduce *possible worlds* to *maximal mereological sums of spatiotemporally interconnected things*. Instead, possible worlds are the entities *best suited* to play the *possible world role* in our modal logics. Lewis does not give modal realists a way of determining which entities are best suited to play the possible world role in our modal logics and so must take the notion of *best suited* as a primitive. The consequence of taking the notion: *best suited* as a primitive, is that modal realism is unable to resolve disagreements between modal realists who have different intuitions regarding which entities are best suited to play the *possible worlds role* in our modal logics.

The important part of these costs is not that they shift the cost-benefit analysis such that modal realism ought to be abandoned. The weight one assigns to the costs and benefits is somewhat subjective. Even Lewis concedes that one is perfectly justified both recognizing the reductive benefits offered by modal realism and rejecting modal realism on the basis of its controversial ontology (*On the Plurality of Worlds* 165). Keep in mind that what I call costs are implicit aspects of Lewis' view that *I believe* to be undesirable implications. Regardless of the subjective aspects associated with costs, the "costs" I outline are implicit aspects of Lewis' view that ought to be considered when considering whether or not to accept modal realism. Given that Lewis justified his belief in modal realism on the basis of a cost-benefit analysis, one ought to be aware of as many costs and benefits associated with modal realism as one can, in order to make an informed decision. One may regard the rest of my thesis as an attempt to clarify aspects of

modal realism that are needed to make an informed decision regarding one's belief on the correct metaphysical picture of modality.

**Section 10: First cost of Modal Realism: Lewis' Counterpart Theory does not Match the Metaphysics of Modal Realism**

The first cost of modal realism is that Lewis must revise or dispense with his version of counterpart theory. Modal realism commits Lewis' to an ontology that is not captured by counterpart theory. Lewis' counterpart theory does not capture the modal facts generated from modal realism because the modal realist must embrace a larger domain of existing individuals than domain of individuals one quantifies over in counterpart theory. More specifically, counterpart theory does not allow for quantification over trans-world individuals. To explain this, I will start by outlining a claim Lewis makes regarding the metaphysics of modal realism.

**Claim 1:** "It is true, and important, that possibilities are invariably provided by whole possible worlds... Every possibility is part of a world" (*On the Plurality of Worlds* 230).

Another way of understanding this is that Lewis believes that every *possible individual* is a part of a world. This interpretation of Lewis' beliefs is justified because Lewis believes that if something is a *possible individual*, then it is a *possibility*. As he says: "I say that any possible individual is a possibility" (*On the Plurality of Worlds* 230).

Lewis' commitment that every possible individual is part of a world is reflected in counterpart theory.

**Postulate 1:**  $\forall x\forall y (Ixy \supset Wy)$

(Nothing is in anything except a world)

**Postulate 3:**  $\forall x\forall y(Cxy \supset \exists zIxz)$

(Whatever is a counterpart is in a world)

**Postulate 4:**  $\forall x\forall y(Cxy \supset \exists zIyz)$

(Whatever has a counterpart is in a world)

(“Counterpart Theory and Quantified Modal Logic” 114)

**Claim 1** does not reflect Lewis’ metaphysical commitments. The implication is that **Postulates 1,3** and **4** must be abandoned and counterpart theory must be revised. Lewis’ modal realism forces him to hold the following metaphysical commitment:

**Commitment 1:** Some possible individuals do not wholly exist in any world but nonetheless wholly exist.

To begin my argument, I first analyze Lewis’ explanation for how we can that say trans-world individuals are possible at a world. Lewis claims that we can use the following biconditional to say that trans-world individuals are possible: “an individual exists at a world iff, quantifying only over parts of that world, some part of that individual exists” (*On the Plurality of Worlds* 211).

This biconditional is ambiguous, as Lewis has numerous ways to interpret existence: “I distinguished three ways of 'being in a world': (1) being wholly in it, that is, being part of it; (2) being partly in it, that is, having a part that is wholly in it; and (3) existing from the standpoint of it” (*On the Plurality of Worlds* 96).

The two interpretations relevant to the biconditional are: *partial* existence at a world and *whole* existence at a world. Something partially exists at a world if and only if a part of it wholly exists at a world. Something wholly exists at a world if and only if *every part of the whole* exists at a world. Given that Lewis has two different ways of interpreting ‘existence at a world’, this biconditional has two different interpretations.

**Interpretation 1:** An individual *partially* exists at a world iff, quantifying only over parts of that world, some part of that individual exists.

**Interpretation 2:** An individual *wholly* exists at a world iff, quantifying only over parts of that world, some part of that individual exists.

It should be clear that **Interpretation 1** is the correct way to understand Lewis’ biconditional, as it justifies Lewis’ belief that trans-world individuals are possible. If we were to use **Interpretation 2**, the biconditional would be clearly false whenever the individual in question is a trans-world individual.

This can be clearly seen though the following argument:

**Assumption:**  $a$  is a trans-world individual  
(an individual that does not wholly exist in any world)

**Interpretation 2:** An individual wholly exists at a world iff, quantifying only over parts of that world, some part of that individual exists.

**From Interpretation 2:** If we quantify only over part of a world  $w$  and some part of individual  $a$  exists in  $w$ , then  $a$  wholly exists in  $w$

**By Modus Ponens:**  $a$  is an individual that wholly exists at world  $w$

As is evident, this argument contains a contradiction. Given that Lewis thinks that contradictions are unrestrictedly impossible, and one can infer a contradiction from **Interpretation 2**, it cannot be the correct way of understanding Lewis, Lewis believes that trans-world individuals are possible (*On the Plurality of Worlds* 211). We can then infer that **Interpretation 1** is the correct way of understanding Lewis' biconditional.

Notice that **Interpretation 1** can only express the *partial* existence of a trans-world individual. It says: 'An individual *partially* exists at a world iff, quantifying only over parts of that world, some part of that individual exists'. An important thing to consider is whether or not trans-world individuals exist as wholes. If modal realism allows for a trans-world individual to exist as a whole, then there exists something that wholly exists outside of any possible world. As per Lewis, a whole trans-world individual cannot exist in any one possible world.

One issue is that Lewis does not discuss whether or not trans-world individuals exist as wholes. All Lewis says in regards to the whole of a trans-world individual is that "counterpart theory concentrates on the parts and ignores the trans-world individual composed of them" (*On the Plurality of Worlds* 203). Notice that Lewis does not say that whole trans-world individuals *do not exist*, he merely says that counterpart theory *ignores* the whole. This gives us good reason to believe that trans-world individuals wholly exist. If Lewis was not committed to the idea that the trans-world individuals exist as wholes, he would have said that they do not exist and not that his logic ignores them.

A better reason for why Lewis is metaphysically committed to the idea that trans-world individuals wholly exist is that trans-world individuals as wholes can be generated from the

UnMerComp: “Even a class of things out of different worlds has a mereological sum. That sum is a trans-world individual” (*On the Plurality of Worlds* 211). Lewis claims: “any part of any world is part of countless mereological sums that extend beyond that world.” (*On the Plurality of Worlds* 199). There is such a thing as a whole trans-world individual: a mereological *sum* of things that exist in different worlds, for example the mereological sum of all of Lewis' counterparts. A mereological sum is a whole individual as it would be nonsensical to claim otherwise. Hence, the UnMerComp allows us to infer that there exist some things, namely some mereological *sums*, that are made up individuals from different possible worlds. This mereological sum cannot wholly exist in any possible world because it is composed of things that are spatiotemporally isolated from one another; however, they exist nonetheless because they are generated by the UnMerComp. Given that the UnMerComp produces whole trans-world individuals, and the UnMerComp generates possible individuals, we can say that whole trans-world individuals are possible individuals. Thus, because modal realism is committed to the idea that whole trans-world individuals are possible individuals, we can infer the following metaphysical commitment from Lewis' view of trans-world individuals:

**Commitment 1:** Some possible individuals do not wholly exist in any world  
but nonetheless wholly exist.

This commitment runs counter to the claim:

**Claim 1:** “It is true, and important, that possibilities are invariably provided by whole possible worlds... Every possibility is part of a world”  
(*On the Plurality of Worlds* 230)

**Claim 1** is false because a trans-world individual as a whole is not a part of any possible world. And Lewis says: “I say that any possible individual is a possibility” (*On the Plurality of Worlds* 230). Yet, if any *possibility individual* is a *possibility*, and some *possible individuals* do not wholly exist in any world, then some *possibilities* are not a part of a world. These possibilities being the possible individuals considered whole trans-world beings. Thus, we can conclude that not every possibility is a part of a world, given that there are some possible individuals that are not any part of a world.

The consequence of this is that Lewis’ counterpart theory is incorrect. Lewis’ counterpart theory runs on a number of assumptions that require every possibility to be a part of a world. More specifically, Lewis’ counterpart theory includes the **Postulates 1, 3 and 4** which misportray the facts of modality. Given what I have argued above, **Postulate 1** must be revised.

**Postulate 1:**  $\forall x\forall y (Ixy \supset Wy)$

(Nothing is in anything except a world)

(“Counterpart Theory and Quantified Modal Logic” 114)

The UnMerComp produces whole individuals that contain spatiotemporally isolated parts (in other words, trans-world individuals). Such individuals are not wholly present in any possible world because if they were, they would not contain parts that are spatiotemporally isolated from one another. While one cannot say that the whole of a trans-world individual is in some possible world, one can say that trans-world individuals are in the domain of existing entities and the domain of possible entities. As such, **Postulate 1** creates a restricted domain of existing and

possible individuals. This implies that Lewis' counterpart theory requires revision in order to capture all of the modal facts provided by modal realism.<sup>6</sup>

**Postulate 3:**  $\forall x\forall y(Cxy \supset \exists zIxz)$

(Whatever is a counterpart is in a world)

(“Counterpart Theory and Quantified Modal Logic” 114)

**Postulate 3** is false given that it contradicts Lewis' views on counterparts. Lewis claims “In the broadest sense, all possible individuals without exception are possibilities for me” (*On the Plurality of Worlds* 234). This implies that for sentences interpreted *De Re* that refer to the broadest domain of possibility, any possible individual can be considered a counterpart for Lewis. Hence, the sentence: ‘Lewis is possibly a whole trans-world individual’ is true if and only if there is a possible individual that is a trans-world individual that also exists as a whole. Furthermore, the metaphysics of modal realism imply that the sentence: ‘Lewis is possibly a trans-world individual’ is true because there is some trans-world individual that exists as a whole. Any logic that includes **Postulate 3** would rule as false the sentence ‘Lewis is possibly a trans-world individual’ because trans-world individuals as a whole are not in any world. If it is possible for Lewis to be a trans-world individual, then some trans-world individuals are counterparts of Lewis. If trans-world individuals can be counterparts of Lewis, then not all counterparts are in worlds. Counterpart theory ought to revise **Postulate 3** so to account for the metaphysical fact that some counterparts are not a part of any world.

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<sup>6</sup> Another argument is that some trans-world beings can also be composed of other trans-world beings. For example, the mereological sum of dogs is within the mereological sum of animals. The mereological sum of dogs is not within any possible worlds (as not every dog is in the same possible world) but the mereological sum of dogs is within the mereological sum of animals. This fact is also left out of any logic restricted by **Postulate 1**.

**Postulate 4:**  $\forall x\forall y(Cxy \supset \exists zIyz)$

(Whatever has a counterpart is in a world)

(“Counterpart Theory and Quantified Modal Logic” 114)

**Postulate 4** is incorrect because it implies that trans-world individuals have no counterparts. Lewis claims: “In the broadest sense, all possible individuals without exception are possibilities for me” (*On the Plurality of Worlds* 234) and “I say that any possible individual is a possibility” (*On the Plurality of Worlds* 230). In light of the lack of justification for why trans-world individuals cannot have counterparts and given Lewis’ belief that every possible individual is a possibility, I see no reason to deny the fact that trans-world individuals have counterparts. If trans-world individuals have counterparts, then **Postulate 4** and must be revised in order to capture all of the metaphysical facts associated with counterparts.

In short, Lewis is metaphysically committed to the fact that some possible individuals do not wholly exist in any world but nonetheless wholly exist. This fact cannot be accounted for in Lewis’ counterpart theory without revision. This is because Counterpart theory includes postulates that restrict the domain of quantification and leave out the modal facts associated with wholly existing trans-world beings. If a modal logic contains **Postulates 1 2 or 3**, then the modal logic fails to capture all of the metaphysical facts about possibility. Thus, a cost that comes from embracing modal realism is that one must revise Lewis’ counterpart theory in order to capture the broadest domain of possibility.

This cost primarily affects anyone who holds one or both of the following views. First, it affects anyone who holds the view that within modal realism, all possibilities are contained in worlds. Second, it affects anyone who holds the view that modal realism provides the means to

justify the correctness of Lewis' logic. The metaphysics of modal realism implies that these views are false. This should not be that much of a surprise given that Lewis claims that his counterpart theory ignores the whole existence of trans-world beings. Regardless, if one accepts modal realism, one is required to revise counterpart theory to match the metaphysical facts generated from modal realism.

### **Section 11: Second Cost of Modal Realism, Humans Cannot Produce a Logic that Captures the Metaphysics of Modal Realism**

In the previous section I argued that Lewis' counterpart theory requires revision in order to properly capture all of the modal facts that can be derived from modal realism. In this section, I argue that modal realism cannot give us certainty that any of the logical laws we stipulate correctly capture the logical laws of modality. To refer back to the quote in my introduction, Lewis claims: "Metalogical results, by themselves, answer no questions about the logic of modality. They give us conditional answers only: if modal operators can be correctly analysed in so-and-so way, then they obey so-and-so system of modal logic. We must consider whether they may indeed be so analysed; and then we are doing metaphysics, not mathematics" (*On the Plurality of Worlds* 17). This quote implies that modal realism is meant to be a metaphysical account that helps answer questions regarding the logic of modality. If a modal logic correctly captures the laws of modality, it must also capture the logical laws that are generated from modal realism. I argue below that modal realism creates epistemic limitations that prevent humans in the actual world from answering specific questions regarding the laws of modality. To begin, I focus on whether or not Lewis' account can justify the use of the law of non-contradiction within

our modal logic or, to put it simply, whether or not modal realism allows us to say that true contradictions are impossible

Recall that, after arguing that there is no existing place that contains a true contradiction, Lewis concludes: “there is no subject matter, however marvellous, about which you can tell the truth by contradicting yourself” (*On the Plurality of Worlds* 7). Lewis' conclusion contains the modality ‘can’. Using the resources afforded to us by modal realism, the sentence ‘P and  $\sim$ P’ is not possibly true if and only if, there is no existing possible world such that P and  $\sim$ P is true in it or possible individual  $x$  such that  $Fx$  and  $\sim Fx$  is true of it. Another way of understanding this is that true contradictions are impossible if and only if, there is no possible individual that has contradictory properties.<sup>7</sup> The critical question to ask is: using only the resources of modal realism, can we, as humans, know that there is no possible individual that has contradictory properties? I argue below that we cannot.

There are two ways that could allow us to know that true contradictions are impossible. The first is if there is a way to view every possible individual. This is clearly a practical impossibility for humans in the actual world as there are an infinite number of possible individuals, and humans are cognitively limited. In other words, there are too many worlds in modal realism for humans to be aware of. This way is clearly practically impossible.

The second way to rule out the possibility of true contradictions is if there is something within the metaphysics of modal realism that allows us to rule out a priori the existence of contradictory possible individuals. Given that the UnMerComp generates possible individuals,

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<sup>7</sup> This includes possible worlds as possible worlds are a special kind of possible individual. As such, one can interpret the sentence as: ‘something  $x$  is impossible if and only if  $x$  does not exist’

there ought to be something in the UnMerComp that allows us to rule out such individuals.

Unfortunately, the UnMerComp does not rule out the existence of contradictory individuals.

The UnMerComp states: “any old class of things has a mereological sum. Whenever there are some things, no matter how disparate and unrelated, there is something composed of just those things” (*On the Plurality of Worlds* 211). As Lewis clarifies: “I really do mean absolutely unrestricted— for instance, I see no bar to composition of sets with individuals, or particulars with universals, or cats with numbers.” (*On the Plurality of Worlds* 212). It should be clear that there is nothing in Lewis’ UnMerComp that prevents the creation of contradictory individuals. This is because the UnMerComp does not stipulate any sort of logical laws; it only explains what possible individuals are. Furthermore, the UnMerComp does not create possible individual *ex nihilo*: “Whenever there are some things, no matter how disparate and unrelated, there is something composed of just those things” (*On the Plurality of Worlds* 211). This implies that if there exists a contradictory individual, then there is something composed of a contradictory individual. Modal realism itself gives us no reason to think that contradictory individuals do not exist, and hence Lewis takes it for granted that there are no contradictory individuals. In other words, modal realism does not help Lewis justify his claim that true contradictions are impossible; instead, it leaves us in a state of epistemic ignorance. Without knowing what possible individuals exist, we cannot know whether or not there are no true contradictions. This argument can be extended to any logical law used in our modal logics.

### **11.1 First Counter Objection to the Second Cost**

One can object to my argument on the following grounds: we can infer from the fact that there are no contradictory individuals in the actual world, that there are no contradictory

individuals in any world. This objection misses a key aspect of modal realism, i.e. that modal realism allows for the existence of individuals that are not accessible to the inhabitants in the actual world. These are the possible individuals considered to be alien (or alien possibilities). Regarding alien possibilities Lewis claims: “We can't get the alien possibilities just by rearranging non-alien ones” (*On the Plurality of Worlds* 92). This implies that we cannot get an alien possibility by appealing to what exists in the actual world. Thus, even if there are no contradictory possible individuals accessible to the inhabitants of the actual world, we cannot conclude that there are no possible individuals that contain true contradictions.

### **11.3 Second Counter Objection to the Second Cost**

One could argue that true contradictions are unintelligible and therefore impossible, but this argument cannot be made by the modal realist. The meaning of the word ‘unintelligible’ can be understood as: ‘cannot be understood’ and the word ‘cannot’ is a modality. In the framework of modal realism, the sentence: ‘a true contradiction cannot be understood’ is interpreted as: “there is no possible individual that understands the meaning of ‘a true contradiction’”. The truth of this sentence cannot be known by humans in the actual world because there is no human in the actual world who has access to what is understood by every possible individual. Hence, one cannot rely on modal realism to rule out the unintelligibility of true contradictions as we have no way of verifying that this is the case.

In short, the conclusion of this argument is that Lewis does not know that true contradictions are impossible as modal realism lacks the resources to provide a decisive answer. All it can do is provide the conditional: if there are no contradictory things then there are no true contradictions. To be clear, this argument is not an endorsement of dialetheism; it is an

illustration of a practical limitation of Lewis' modal realism, that being that Lewis' modal realism does not rule out a priori the possibility of true contradictions.

### **11.3 Third Counter Objection to the Second Cost**

One can argue that the solution to this problem is simple. Lewis must build the law of noncontradiction into the UnMerComp. This can be easily done.

**UnMerComp1:** Whenever there are some things, no matter how disparate and unrelated, there is something composed of just those things *and nothing is contradictory*.

This takes the Law of Noncontradiction as a primitive though not a modal primitive. As such, this fits in line with Lewis' view.

There are two primary problems that come with modifying the UnMerComp. The first is that by stipulating logical laws within the UnMerComp, one is not solving any problems regarding the laws of logic; one is stipulating: here is what the logical laws will be. This is something Lewis wishes to avoid as he believes that the truth is not determined by us "Certainly we are not entitled just to make the truth be one way or the other by declaration. Whatever the truth may be, it isn't up to us" (*On the Plurality of Worlds* 114). The second is that this modified UnMerComp does not offer any benefits over the unmodified version. Imagine that Lewis is in a debate with a dialetheist who is also a modal realist. Imagine, the dialetheist modifies the UnMerComp as follows:

**UnMerComp2:** Whenever there are some things, no matter how disparate and unrelated, there is something composed of just those things and there are

things that are contradictory

as opposed to the proposed solution:

**UnMerComp1:** Whenever there are some things, no matter how disparate and unrelated, there is something composed of just those things and nothing is contradictory.

One of these accounts will be wrong if the other is right. The deciding factor will be whether or not some things are contradictory. The stipulation: ‘nothing is contradictory’ or ‘some things are contradictory’ does nothing to determine whether **UnMerComp1** or **UnMerComp2** is true. What really matters is what exists. While Lewis can stipulate that nothing is contradictory, why bother? It does not add any benefit to the overall theory. Instead of being stuck with not knowing whether or not true contradictions are possible we are left with a similar problem of not being able to know whether the added stipulation: ‘there are not true contradictions’ is true or false. As Lewis claims, it isn't up to us. (*On the Plurality of Worlds* 114). Thus, I see no benefit for modal realism to add the stipulation that there are no contradictory individuals as it does not alter the facts about what does and does not exist.

It is important to note that this argument can be applied to any logical law because modal realism allows for there to be existing alien individuals that cannot be conceived of by humans in the actual world. As Lewis claims: “We can't get the alien possibilities just by rearranging non-alien ones” (*On the Plurality of Worlds* 92). In order for us to know whether some law that we believe to be a necessarily true logical law is in fact necessarily true, we would need to know whether such a law applies in alien worlds or to alien individuals. However, given that alien

possibilities cannot be constructed out of the possibilities in the actual world, there is no way to know if the laws we stipulate apply universally.

In short, accepting Lewis' modal realism comes with some epistemic limitations, namely that we cannot be certain that the logical laws we stipulate hold in the farthest domains of possibility. This stems from our inability to know anything about alien possibilities (in fact we lack the ability to know whether or not there are alien possibilities). The second cost for the modal realist is that there is very little we can know about the logical laws that govern the furthest domains of possibility, as these domains are epistemically closed off from us. In other words, by accepting modal realism, one must accept that one is unable to be certain about the true laws that govern modality. At best, they one may be able to be certain about the laws that govern certain restricted domains of modality.

### **Section 12: Third cost of Modal Realism 'Possible Worlds' are not 'the Ways the Actual World Could be'**

Lewis believes that Modal Realism is the ontological thesis that holds:

- 1) "absolutely every way that a world could possibly be is a way that some world is" (*On the Plurality of Worlds* 2, 86) and
- 2) "absolutely every way that a part of a world could possibly be is a way that some part of some world is" (*On the Plurality of Worlds* 2, 86).

It is important to get clear on what 1) means. Lewis believes that we can reduce the concept: 'the ways a world could be' to 'the worlds that exist'. As he says: "Given modal realism, it becomes advantageous to identify 'ways a world could possibly be' with worlds

themselves” (*On the Plurality of Worlds* 86). This might lead one to believe that *every way that the actual world could possibly be*, is represented by a possible world. This is because ordinary, possible worlds represent everything that is possible for the actual world. In this section I argue that modal realism commits us to the view that there are more ways that the actual world could possibly be than there are worlds because *possible worlds* do not capture *all of the ways the actual world could be*. This conclusion is derived from two commitments held by modal realists.

**Commitment 2:** Some impossible worlds are possible individuals

**Commitment 3:** The actual world is possibly an impossible world

These commitments force the modal realist to hold the unintuitive view that possible worlds do not capture the ways the actual world could have been. It is important to note that I take the notion of ‘impossible world’ to be identical to ‘something that contradicts the definition of a possible world’ to fit in line with Lewis’ beliefs surrounding impossibility. This means that something  $x$  is an impossible world if and only if  $x$  is not a maximal sum of spatiotemporally interrelated things. In other words, anything that is not a possible world is an impossible world.

### **12.1 Some Individuals are Impossible Worlds**

To begin, I explain why the modal realist holds **Commitment 2** by I outlining an impossible world given by Lewis. Recall that Lewis precludes the intuitive possibility: “that a world might possibly consist of two or more completely disconnected spacetimes” (*On the Plurality of Worlds* 71) on the grounds that “Given a choice between rejecting the alleged possibility of disconnected spacetimes within a single world and (what I take to be the alternative) resorting to a primitive worldmate relation, I take the former to be more credible”

(*On the Plurality of Worlds* 71-72). For Lewis, a world that consists of two or more distinct spacetimes is a world that is impossible. It is impossible because if such a thing were a world, it would *contradict* the definition of a possible world: “a maximal mereological sum of spatiotemporally interrelated things” (*On the Plurality of Worlds* 73). A world consisting of two or more distinct spacetimes is not a maximal mereological sum of spatiotemporally interrelated things, as not all objects in such a world are spatiotemporally interrelated. Thus, we have an impossible world: something that contains two distinct spacetimes.

Next, I argue that there exists a possible individual that contains two entirely distinct spacetimes. Such an individual exists because such an individual is generated by UnMerComp. The UnMerComp states: “any old class of things has a mereological sum. Whenever there are some things, no matter how disparate and unrelated, there is something composed of just those things. Even a class of things out of different worlds has a mereological sum” (*On the Plurality of Worlds* 211). The UnMerComp implies that, if there are two parts of reality that have two distinct spacetimes, then there is something composed of two distinct spacetimes. Given that within Lewis’ plenum each world is spatiotemporally isolated for one another, there must be some individual composed of two distinct spacetimes. From this we can conclude that the sentence: ‘It is possible for there to be an *individual* that contains two entirely distinct spacetimes’ is true because there is some possible individual that contains two entirely distinct possible worlds. Hence, we have two implications from Lewis’ view.

**Implication 1):** An impossible world is something that contains two distinct spacetimes

**Implication 2):** There is some possible individual that contains two entirely distinct space times.

From these two implications we can infer that the modal realist holds the view: There is no possible world that contains two entirely distinct spacetimes but there is a possible individual that contains two entirely distinct space times. From this we can conclude:

**Commitment 2:** Some impossible worlds are possible individuals.

Lewis must accept **Commitment 2** because although there is no possible world that contains two entirely distinct spacetimes (as per the definition of a possible world), there is some possible individual that contains two entirely distinct spacetimes. Such an individual exists because such an individual is generated from the UnMerComp and such an individual cannot be a possible world because if it were, it would contradict the definition of a possible world. This is quite unintuitive. However, what is even more unintuitive is that from

**Commitment 2:** Some impossible worlds are possible individuals,

we can infer:

**Commitment 3:** The actual world is possibly an impossible world (or the actual world is possibly not a possible world)

If Lewis' view implies that the actual world is possibly not a possible world, then possible worlds do not capture the ways the world could be. This is because there is a way the world could be that is not a possible world.

## **12.2 There Are More Ways The Actual World Could Be, Than There are Possible Worlds**

A possible world is “a maximal mereological sum of spatiotemporally interrelated things” (*On the Plurality of Worlds* 73). A possible world is a kind of possible individual and not all possible worlds are possible individuals.

Lewis says that:

- 1) “any possible individual is a possibility” (*On the Plurality of Worlds* 230) and
- 2) “in the broadest sense, all possible individuals without exception are possibilities” (*On the Plurality of Worlds* 234)

One may argue that 2) only applies to the possibilities associated with me and may not apply to all of the possibilities associated with worlds. However, if, as Lewis claims, “In the broadest sense, all possible individuals without exception are possibilities for me” (*On the Plurality of Worlds* 234), then why, in the broadest sense, would it also not be the case that all possible individuals are a possibility for the actual world? I see no reason to believe that every possible individual is a possibility for me but not every possible individual is a possibility for the actual world. Hence, we can reasonably infer from 2) that in the broadest sense, all possible individuals without exception are possibilities for the actual world. This means that, in the broadest sense, every possible individual generated from the UnMerComp is a possibility for the actual world. In essence, every possible individual is a possibility. Every individual UnMerComp exists in the same sense we exist. The actual world has a counterpart that is an impossible world. That is to say that every possibility is an actuality somewhere.

Now, there is a difference between, on the one hand, what a possible world is, and on the other hand, and what is possible for the actual world.

**What a possible world is:**

“A maximal mereological sum of  
spatiotemporally  
interconnected things”

(*On the Plurality of Worlds* 73)

**What is possible for the actual world:** Whatever is generated through the  
UnMerComp

Previously, I established that within modal realism there is some possible individual that has two spatiotemporally distinct spacetimes because the UnMerComp generates possible individuals that contain two spatiotemporally distinct spacetimes. We can infer from the existence of such a possible individual, that there is a possibility that the actual world is such an individual. This is because if something is a possible individual, then it is a possibility and there is some possible individual that contains two distinct spacetimes. Hence, it must be a possibility for the actual world to be something that contains two distinct spacetimes. If, for Lewis, every single possible individual is a possibility and some possible individual contains two distinct spacetimes, then an individual consisting of two distinct spacetimes is a possibility for the actual world. It is important to remember that an individual consisting of two distinct spacetimes is an impossible world because no possible world contains two distinct spacetimes.

Thus, we can arrive at **Commitment 3**:

**Commitment 3:** The actual world possibly contains an individual composed of two distinct spacetimes, but no possible world contains two distinct spacetimes.

Lewis holds **Commitment 3** because the actual world has the property *is a possible world* and there is some mereological sum (or possible individual) that contains two distinct spacetimes. If possible individuals are possibilities, then This implies that the actual world could

have been something that contains two distinct spacetimes. This does not mean that it is possible for something to be a possible world and contain two distinct spacetimes. In modal realism, this would mean that there is something that is a possible world and has the property *contains two distinct spacetimes*, however, modal realism does not allow for such an individual. Instead it means that the actual world is a *possible world* and *possibly* contains two distinct spacetimes.

### **12.3: Possible Worlds fail to Capture Possible States of Affairs**

The modal realist's **Commitment 3** shows that the two concepts: 'possible worlds' and 'the ways that the world could be' are distinct. There are more ways that the actual could be than there are possible worlds. No possible world can be something that contains two distinct spacetimes but there is a way the world could be that contains two distinct spacetimes. This *seems* like an unintuitive result even for Lewis. As he claims:

1): "I therefore believe in the existence of entities that might be called the ways things could have been. I prefer to call them 'possible worlds' (*Counterfactuals* 84).

2): "absolutely every way that a world could possibly be is a way that some world is" (*On the Plurality of Worlds* 2, 86)

3) "If there are many worlds, and every way that a world could possibly be is a way that some world is, then whenever such-and-such might be the case, there is some world where such-and-such is the case." (*On the Plurality of Worlds* 5)

Given that it is possible for the actual world to contain two distinct spacetimes even though there are no possible worlds that contain two distinct spacetimes, Lewis' account of

possible worlds fails to capture the concept: *the ways that the actual world could be*. The world could have been something that contains two distinct space times even though there is no possible world that contains two distinct spacetimes. This is a cost for anyone who believes that Lewis successfully reduces the notion *the ways a specific world could possibly be* to *possible worlds*. If one wishes to create such a reduction, one must create a different picture of possible worlds.

### **Section 13: Fourth Cost of Modal Realism (Modal Realism does not help Solve Debates Between Modal Realists who have Different Intuitions Regarding Modality)**

The rest of this thesis is concerned with the implications that arise from Lewis' commitment to the fact that there are more ways the world could be than possible worlds. Recall that Lewis is attempting to give a reductive account of modality. This implies that he is attempting to give a reductive account of possible worlds. Lewis believes that possible worlds represent the ways the world could have been. Lewis also believes that possible worlds reduce to 'existing worlds. Hence, Lewis believes that the meaning of the term 'the ways the world could have been' reduces to existing worlds. The concept 'the ways the world could have been' stands in a bijection with existing worlds.

Reduction operates by stipulating that two things are identical. If  $x$  is reducible to  $y$ , then  $x$  is identical to  $y$ . For example, if psychological laws are reducible to physical laws, then psychological laws are identical to physical laws. If possible worlds are reducible to existing worlds, then possible worlds are identical to physical worlds. The issue is that Lewis believes that he can reduce the concept 'ways the world could be' to existing worlds. However, Lewis' account fails at a proper reduction, as they are not identical and do not stand in a bijection. There

are more ways the world could be than there are existing worlds. The actual world could be something that consists of two distinct spacetimes, even though there is no possible world that consists of two distinct spacetimes. Hence, Lewis' fails to reduce the 'ways the world could be' to existing worlds.

Interestingly Lewis accepts that this may be the case:

I believe in entities that deserve the names because they are well suited to play the roles. The entities I put forward as candidates are the same in every case: sets of worlds. Worlds as *I* understand them...I do not mean to wax monopolistic, claiming that sets of worlds are the only candidates suited to play the roles and deserve the names. Among the entities I am most committed to, possible individuals and set-theoretic constructions out of them, there are plenty of other candidates. It might even be, sometimes, that other candidates are preferable to the sets of worlds. For the roles associated with the names are by no means fully and uncontroversially settled. Sets of worlds are well suited to some versions of the roles, other constructions are better suited to other versions...there is room for different versions of 'ways things might be' (*On the Plurality of Worlds* 185).

This quote highlights two key parts of Lewis commitments to possible worlds. The first is that Lewis accepts that his account of possible worlds may not reflect every conception of the ways things might be. Instead, what he is trying to do is figure out which entities are *best* suited (or *well suited*) to play the roles that possible worlds play in our logic: "I do not mean to wax monopolistic, claiming that sets of worlds are the only candidates suited to play the roles and deserve the names" (*On the Plurality of Worlds* 185). The second is that he is *not* committed to the idea that maximal sums of spatiotemporally interconnected things will always be the *best suited* entities to play the possible world role: "Sets of worlds are well suited to some versions of the roles, other constructions are better suited to other versions...there is room for different versions of 'ways things might be'" (*On the Plurality of Worlds* 185). What he is ontologically

committed to are the entities generated from the UnMerComp. This creates an understanding that differs from the traditional conception of Lewis' metaphysics.

### 13.1 Consequences of Lewis' View of Possible Worlds

Lewis' account is not a metaphysical account of possible worlds, it is a metaphysical account of possible individuals. Lewis' account of possible worlds is merely an account of what he believes are the best suited entities to play the possible world role in our modal logics. He admits that some entities may be *better suited* to play the possible world role than the entities he prefers. This means that if we use a different kind of entity to play the possible world role, many of the things he deems impossible may in fact be possible. For example, if we use a different kind of entity to play the possible world role, some possible worlds may contain two distinct spacetimes. If we use a different kind of entity to play the possible world role, some possible worlds may contain entities that have trans-world identity. I defend this is **Section 13.3**.

Second, this means that *possible worlds* are not identical to *maximal sums of spatiotemporally interconnected things*. Hence, Lewis' fails at reducing *possible worlds* to anything other than the entities best suited to play the possible world role in our modal logics. What he says is: "All this is a matter of fitting suitable entities to the various rather illdefined roles that we rather indecisively associate with various familiar names. Don't think of it as a matter of discovering which entities really, are the states of affairs, or the ways things might be, or the possibilities, or the propositions, or the structures!" (*On the Plurality of Worlds* 186). If we cannot *discover* which entities *really* reflect the ways things might be or states of affairs, we are left with a difficult question: what is Lewis' fundamental definition of a possible world? The

answer is simple. Possible worlds are whatever entities are best suited to play to theoretical roles we associate with possible worlds in our modal logics, relative to the context. In some contexts, his conception of worlds is better, while in other contexts, different conceptions are better: “It might even be, sometimes, that other candidates are preferable to the sets of worlds.” (*On the Plurality of Worlds* 185). The only two restrictions on what is named ‘possible worlds’ is that these entities must be generated by the UnMerComp and they must be the *best suited* entities. In other words, possible worlds reduce to entities generated by the UnMerComp that are *best suited* to play the possible world role.<sup>8</sup> His expression of this view is prevalent throughout his book:

- 1) “But I must insist that my modal realism is simply the thesis that there are other worlds, and individuals inhabiting these worlds; and that these are of a certain nature, and suited to play certain theoretical roles.” (*On the Plurality of Worlds* viii).
- 2) “To deserve the name of ‘property’ is to be suited to play the right theoretical role” (*On the Plurality of worlds* 55)<sup>9</sup>
- 3) “The entities that deserve the names are the entities best suited to fill the roles” (*On the Plurality of Worlds* 184)
- 4) “That is to say, I believe in entities that deserve the names because they are well suited to play the roles” (*On the Plurality of Worlds* 185)

These statements make Lewis’ explanation of his view confusing. On one hand, he seems to commit himself to the existence of possible worlds: “But I must insist that my modal realism is simply the thesis that there are other worlds, and individuals inhabiting these worlds; and that

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<sup>8</sup> ‘Best’ and ‘better suited’ or ‘well suited’ can be used interchangeably in my argument.

<sup>9</sup> possible world is a property within counterpart theory

these are of a certain nature, and suited to play certain theoretical roles” (*On the Plurality of Worlds* viii). In this quote, one may reasonably infer that Lewis believes that these other *possible* worlds exist *and* happen to be the best suited entities to play certain theoretical roles in our modal logics. Lewis does not seem to commit himself to the belief that the entities named ‘possible worlds’ are *identical* to whatever is best suited to play theoretical roles. However, given that other kinds of entities may be better suited to play the possible world role and possible worlds are not identical to maximal mereological sums of spatiotemporally interconnected things, possible worlds must be identical to the entities *best suited* to play the possible world role. This is further justified by Lewis’ claim: “For the roles associated with the names are by no means fully and uncontroversially settled.” (*On the Plurality of Worlds* 185), the entities that are considered the *best entities to play the possible world role*, may change depending on the context.

Thus, we must revise Lewis’ definition of ‘a possible world’ to reflect Lewis’ commitments:

**Correct definition of a ‘possible world’:**  $x$  is a possible world iff  $x$  is generated by the UnMerComp and is *best suited* to play the possible world role in modal logic, depending on a given context.<sup>10</sup>

We can then understand Lewis’ definition of a possible world: “a world is a maximal mereological sum of spatiotemporally interconnected things’ as a statement of belief that these entities are the best suited entities within the ontology of modal realism to play the possible

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<sup>10</sup> Again, one can replace ‘best suited’ with ‘better suited than other entities’ or ‘suitable’ if one wishes.

world role. This is not *necessarily* a definition of a *possible world* that modal realists need to agree with.

### **13.2 Problems with Possible Worlds Within Modal Realism**

Modal realism is an attempt to provide a reductive account of modality. I do not deny that modal realism provides a successful metaphysical reduction of possible worlds. Instead, I argue that it does not provide a helpful reduction of possible worlds. If possible worlds reduce to the entities best suited to play the possible world role,<sup>11</sup> then Lewis' reduction contains an unanalyzed notion of 'best suited'. Therefore, Lewis takes the notion 'best suited' as a primitive albeit not a *modal* primitive.

To figure out whether or not this primitive is problematic, it is important to understand whether or not Lewis gives us a way of determining which entities within the ontology of modal realism are the best suited to play the possible world role in our modal logics. Lewis' answer is: "The entities that deserve the names are the entities best suited to fill the roles. To figure out what those are, we must survey the candidates according to our best systematic theory of what there is" (*On the Plurality of Worlds* 184). This response is unhelpful as it does not explain how to determine which entities are best suited, it only says that we must survey the candidates. Again, the critical question is: what does Lewis mean by 'best'? And this answer is unhelpful.

Another option is that the best entities are the ones that are present in the 'best theory' i.e. the theory that has the most *unity* and *economy* (*On the Plurality of Worlds* 4). However, this cannot be the answer. As I show below, the *unity* and *economy* of the theory will not change even

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<sup>11</sup> One may replace possible world role with a 'certain kind of role' to retain the reductive nature of Lewis' view

if we change which entities are considered possible worlds. To explain this, it is important to get clear on what Lewis means by ‘economical and unified’.

For Lewis, if theory *s* contains a less diverse number of primitives than theory *y*, *s* is more economically unified than *y*. This can be seen in the quote: “We find the wherewithal to reduce the diversity of notions we must accept as primitive, and thereby to improve the unity and economy of the theory that is our professional concern - total theory” (*On the Plurality of Worlds* 4). Given that in modal realism, all of the modal notions are reducible to either counterpart relations or entities generated by the UnMerComp: (i.e. “possible” reduces to counterparts, “counterparts” reduce to “possible individuals”, “possible individuals” reduce to individuals generated by the UnMerComp), whatever *entities* we choose to play the role of possible world will reduce to some kind of entity that is generated by the UnMerComp. Thus, whatever entities we choose will not add any new primitives not present. An example of a differing view of possible worlds that has the same economy and unity as Lewis’ can be shown easily.

### **13.3 Redefine ‘Possible Worlds’ to mean ‘Counterparts of the Actual World’**

The clearest way of showing a different account of possible worlds that has the same economy and unity as Lewis’ is to use *counterparts of the actual world* to play the possible world role in our modal logics. To do this requires four steps.

First, present an account of what there *is*. What, there *is* is the entities generated from the UnMerComp. This gives us the same fundamental ontology as Lewis’ account. Every individual entity present in Lewis’ modal realism, will be present in this account.

Second, define the 'actual world' as: the maximal mereological sum of spatiotemporally interconnected things that I exist in.

Third, define 'possible worlds' as: counterparts of the actual world. This means that something  $w$  is a possible world if and only if  $w$  is a counterpart of the actual world. In the broadest domain, anything that is generated from the UnMerComp, is a counterpart of the actual world.

Fourth, define 'possible individuals' as individuals generated by the UnMerComp that exist as parts of a counterpart of the actual world. Something  $x$  is a possible individual if and only if  $x$  is generated by the UnMerComp and it is a part of a counterpart of the actual world.

Whatever is considered 'a counterpart of the actual world' will have a great amount of indeterminacy, but this indeterminacy is already present in Lewis' modal realism. Lewis' modal realism already contains counterpart relations.

My, modified account proposes that we reduce possible worlds to *counterparts of the actual world* instead of reducing possible worlds to *maximal mereological sums of spatiotemporally interconnected things*.

My modified account may seem like it presents an extremely different account of modality than Lewis'. It does not. The difference between my revision and Lewis' is *terminological, not ontological*. Instead of believing that 'maximal sums of spatiotemporally interconnected things' are the best suited to play the possible world role in our modal logics, I say that counterparts of the actual world are best suited to play the possible world role in our modal logics. There is no ontological difference between Lewis and me. We both agree on what

there *is* and what there *is* are the entities generated from the UnMerComp. There are no new primitives within this account; any primitives in this account exist within modal realism (such as counterpart relations). The primary difference is that I say ‘possible worlds’ are counterparts of the actual world while Lewis says they are maximal sums of spatiotemporally interconnected things. Again, neither account has a different ontology; they only differ on their beliefs regarding the kinds of entities best suited to play the possible world role in our modal logics. Hence, given that my modified account of possible worlds does not add any primitives that are not already present in modal realism, my modified account has the same economy and unity as Lewis’ account of possible worlds. The concepts: *unity* and *economy*, are unable to determine which entities are better suited to play the possible world role in our modal logics.

In essence, if we assume the *ontology* of modal realism, then it is possible to have two differing conceptions of possible worlds that have the same theoretical unity and economy. If this is the case and Lewis provides no further explanation as to what makes some entities better suited to play the possible world role than others, then modal realism lacks the resources to resolve debates between modal realists who have different intuitions. For example, how would the modal realist resolve a debate between two people who disagree over whether or not maximal sums of spatiotemporally interconnected things are *better suited* to play the possible world role than counterparts of the actual world? Without an account of what it means for a kind of individual to be *better suited than other kinds of entities to play the possible world role*, there is no reason to value the truths generated from Lewis’ conception of possible worlds, any more seriously than the truths generated from other conceptions grounded in modal realism. This is problematic.

To clarify what's at stake here, imagine that I am a modal realist and I believe that counterparts of the actual world are entities best suited to play the possible world role in our modal logics. Now, imagine that I am debating Lewis who is a modal realist who believes that maximal sums of spatiotemporally interconnected things are the entities best suited to play the possible world role. Both Lewis and I engage in a debate over two things. First, the possibility of a possible world having two distinct spacetimes. Second, the possibility of an individual having trans-world identity.

To see how this plays out, imagine I argue that the **Sentence 1**:

**Sentence 1:** It is possible for there to be a *possible world* that contains two  
distinct spacetimes

is true because there is some possible world i.e. a counterpart of the actual world, that contains two distinct spacetimes. This is the case under my conception because there is no restriction in the counterpart relation that rules out such a world being considered a counterpart to the actual world.

Imagine Lewis argues that **Sentence 1** is false, because there is no maximal sum of spatiotemporally interconnected things that contains two distinct space times. Who is right and who is wrong? We are both saying similar things. I am saying that it is the case that there is a kind of entity best suited to play the possible world role that entity allows for the possibility of two distinct spacetimes and Lewis is saying that it is not the case that there is a kind of entity best suited to play the possible world role that allows for two distinct space times. How do we determine who is right or who is wrong? Without having an account of what it means for one

entity to be better suited than others to play the possible world role, it seems that we are at a stalemate.

Now imagine that Lewis concedes that **Sentence 1** is true and claims: the sentence ‘it is possible for there to be a possible world that contains two distinct spacetimes’ is true and in certain contexts and false in others. This means that Lewis argues that the sentence:

**Sentence 2:** ‘It is *possibly possible* that there is a *possible world* that contains two distinct spacetimes’ is true.<sup>12</sup>

Now a new problem is created. What entities are best suited to play the possible world role in the sentence: ‘it is possible that it is possible for there to be a possible world that contains two distinct spacetimes’? This sentence means that it is possible for it to be possible that there is something  $x$  that contains two distinct space times and is the best suited entity to play the possible world role. Lewis can reason that **Sentence 2** is true because it is possible for counterparts of the actual world to be the *best suited entities* to play the possible world role. Why is this the case? What makes it possible for counterparts of the actual world to be the *best suited entities* to play the possible world role in this context? Lewis does not have any explicit answer as to why, in this context, we ought to believe counterparts of the actual world are the *best suited entities* to play the possible world role in our modal logics. If this is true, why should we even accept Lewis’ concession? To further this point, consider the sentence:

**Sentence 3:** It is possible for there to be an individual that has trans-world

Identity

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<sup>12</sup>  $(\diamond \diamond \psi) = T$

Imagine that I argue that **Sentence 3** is true, because under my account I can truly say that there is some individual that wholly exists in two possible worlds. For example, individual  $x$  can exist in one counterpart of the actual world and  $x$  can also exist in a different counterpart of the actual world. All that is required is to have one counterpart be a mereological sum generated from the UnMerComp and the other counterpart to be a mereological sum generated by the UnMerComp that contains the previously mentioned mereological sum. If  $x$  wholly exists in the first mereological sum, then  $x$  will wholly exist in the second, provided that the second mereological sum contains the first. Thus, under my revised account,  $x$  wholly exists in two counterparts of the actual world. This implies that one individual can wholly exist in two worlds. Hence, **Sentence 3** is true.

Imagine that Lewis disagrees because under his conception, there can be no trans-world identity because there is no individual that wholly exists in two worlds. How can modal realism determine whether or not trans-world identity is possible? The answer depends on whether or not there are entities *suited* to play the possible world role that allow for trans-world identity. However, without an account of what it means for entities to be *suited*, or *better suited* or *best suited* to play the possible world role in our modal logics, Lewis' modal realism is unable to resolve debates between *modal realists* who have differing intuitions about which entities ought to play the possible world role in our modal logics.

### **13.4 Summary**

There are three key points that can be seen from what has been said so far. First, changing the entities playing the possible world role from maximal sums of spatiotemporally

interconnected things to counterparts of the actual world does not amount to any ontological differences. The two accounts are committed to the same individuals, even though the individuals have different names.

Second, changing the entities playing the possible world role from maximal sums of spatiotemporally interconnected things to counterparts of the actual world creates substantial logical differences. Trans-world identity is possible in one and impossible in the other. In one, it is possible for something to be a world and have two distinct spacetimes even though it is impossible in the other. This means that the correct account of modal logic is in part, dependent on which entities are the best suited to play the possible world role.

Third, without an account of what makes some entities better suited than others to play the possible world role, Lewis' account has a limited ability to solve logical debates between modal realists. For example, why are the entities Lewis names 'possible worlds' *better suited* to play the possible world role than the entities I proposed? Lewis has no answer to this. If two modal realists have differing modal intuitions and use different kinds of individuals to play the possible world role, whose intuitions are correct? Lewis has no answer to whose intuitions are correct. Hence, Lewis' account is insufficient to solve a number of logical debated between modal realists.

To be clear, the issue isn't whether or not we ought to accept my revised account; the issue is how modal realism resolve debates between people with differing modal intuitions. How does modal realism resolve a debate between people who disagree on whether or not there is a possible world that has two distinct spacetimes? How does modal realism resolve a debate over whether or not a person can exist in two possible worlds? Without an account of what makes

some entities *better suited* than others, it cannot. Another way of understanding my conclusion is that Lewis' account as it is can give us conditionals such as 'If  $x$  is considered a possible world, then  $y$  follows' but it cannot help us understand whether or not  $x$  ought to be considered a conditional. This is the very thing that Lewis faults theories that use possible worlds for heuristic analysis for lacking: "They give us conditional answers only: if modal operators can be correctly analysed in so-and-so way, then they obey so-and-so system of modal logic. We must consider whether they may indeed be so analysed" (*On the Plurality of Worlds* 17). However, if Lewis theory does not have an account of what it means for certain kinds of entities to be better suited to play the possible world role than others, then Lewis' theory runs into the same problem. Without a way of determining the *best suited* entities to play the possible world role, modal realists have no way of determining whether or not our modal operator 'possible' is being correctly analysed, when what we mean by 'possible' is: true in a possible world. All we are stuck with are conditionals such as: if  $x$  is considered a possible world then  $y$  follows. This is not much better than the theories Lewis criticizes, but is nonetheless a consequence of taking the notion *best suited* as a primitive<sup>13</sup>.

### **13.5 Lewis' Counter Objection**

Lewis may argue that the *best suited entities* are the ones that allow our modal logics to capture our intuitions. For example, in the sentence:

**Sentence 2:** It is *possibly possible* that there is a *possible world* that contains  
two distinct spacetimes is true

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<sup>13</sup> or taking the notions *better suited* and *suites* as primitives

counterparts of the actual world may be the *best suited entities* because they allow both Lewis and I to retain our intuition that there is some kind of entity that is best suited to play the possible world role in this context. If Lewis holds this view, then it seems to weaken our motivations for accepting modal realism. Lewis criticizes accounts of possible worlds that use possible worlds for heuristic guidance. He claims that such accounts only produce metalogical results and: “Metalogical results, by themselves, answer no questions about the logic of modality. They give us conditional answers only: if modal operators can be correctly analysed in so-and-so way, then they obey so-and-so system of modal logic.” (*On the Plurality of Worlds* 17). To motivate modal realism Lewis claims: “We must consider whether they may indeed be so analysed; and then we are doing metaphysics, not mathematics” (*On the Plurality of Worlds* 17). If the *best suited entities* are merely entities that preserve our intuitions, then than modal realism does not help us understand how to correctly analyze modal operators.

To illustrate this, imagine that there are two modal realists: Mary and Lewis. Mary has the intuition that the sentence: ‘possibly  $x$ ’ is true and as such, believes that  $x$  is true in some possible world. Imagine Lewis has the intuition that the sentence ‘possibly  $x$ ’ is false and as such, believes that  $x$  is not true in any possible world. Imagine that to capture their intuitions they both use different entities to play the possible world role. In this example, Mary and Lewis are saying two similar things.

**Mary’s claim:** Intuitively I believe the sentence ‘possibly  $x$ ’ is true. If we use such and such an entity to play the possible world role, then the sentence: possibly  $x$ ’ is true.

**Lewis' claim:** Intuitively, I believe the sentence 'possibly  $x$ ' is false. If we use such and such an entity to play the possible world role, then the sentence 'possibly  $x$ ' is false.

Notice that both Mary and Lewis disagree on how to analyze the modality 'possibly'. Imagine that Mary and Lewis differing intuitions and differing views on possible worlds, force them to have two different logics. If Mary and Lewis' differing views lead them to have differing logics, then modal realism gives us conditional answers: if modal operators are analyzed in such and such a way, then they obey such and such system of modal logic. How is this any better than a metaphysics that leaves us with conditionals answers: "if modal operators can be correctly analysed in so-and-so way, then they obey so-and-so system of modal logic" (*On the Plurality of Worlds* 17)? There does not seem to be any substantial difference. More importantly because the best suited entities to play the possible world role are the entities that allow us to create a logic that captures our intuitions, modal realism cannot resolve any disputes between people who disagree over how to correctly interpret a modal operator. If the best suited entities to play the possible world role are the entities that allow us to capture our intuitions, then all intuitions that can be captured in modal realism have equal value. There is no account of *value* given in view: the best suited entities to play the possible world role are the entities that capture our intuitions. To put it simply, if this is Lewis' view on possible worlds, there is no way of determining which interpretation of 'possibly  $x$ ' we ought to adopt or which interpretation is correct relative to the circumstance. If this is Lewis' understanding of the possible world role, and modal realism is

intended to solve debates over the logic of modality or debates over how to correctly interpret modal operators, then modal realism can do neither. This is extremely problematic.

To be clear, I am not saying that Lewis holds the view that the entities best suited to play the possible world role are the entities that capture our intuitions. Lewis' does not really clarify what he means by "the entities best suited to fill the roles" (*On the Plurality of Worlds* 184) and all he really says is: "To figure out what those are, we must survey the candidates according to our best systematic theory of what there is." (*On the Plurality of Worlds* 184). This is no help for two people who have identical ontological commitments but differing modal intuitions. What I am saying is that if Lewis holds the view that the best suited entities to play the possible world role are the entities that allow us to capture our intuitions, then modal realism has no way of resolving debates between modal realists. Regardless of whether or not Lewis holds such a view, Lewis ought to clarify what it means for an entity to be *better suited* than others to play the possible world role in our modal logics. Without such clarification, his fundamental commitments to possible worlds are unclear.

### **13.6 Conclusions**

In this section I have argued that modal realism does not give us a metaphysical account of possible worlds. It cannot because Lewis is primarily committed to possible individuals and mathematical sets. In so far as Lewis believes that possible worlds are the entities best suited to play the possible world role, Lewis owes an account as to what it means for an entity to be better suited than others. Without such an account, there are a number of debates surrounding modal logic that modal realists cannot solve. This isn't to say that modal realists cannot give such an account or that modal realism has an irreparable problem, it is merely to say that modal realism's

reduction of possible worlds, rests on an unanalyzed primitive (albeit a non-modal primitive). Relying on the primitive notion of best suited (or better suited) to play the possible world role is problematic because if modal realism is meant to give us substantive answers to debates surrounding the logic of modality, then there must be certain kinds of entities within modal realism that are *best suited (or better suited than others)* to play the possible world role in our modal logics. If Lewis intends to have a reductive account of modality that helps us solve such debates, then he must explain in virtue of what metaphysical facts something is the best suited to play the possible world role in our modal logics. Without having such an explanation, modal realism is unable to solve debates between modal realists that have differing modal intuitions. This is a limitation of modal realism. If Lewis claims that the entities best suited to play the possible world role are the ones that capture our intuitions, then modal realism does not and cannot have the ability to resolve debates between modal realists who have differing modal intuitions. Either way, Lewis ought to clarify what it means to be the best suited entity to play the possible world role in our modal logics.

#### **Section 14: Summary**

I have argued that there are four main costs to modal realism. The first is that the metaphysics of modal realism implies the falsity of Lewis' counterpart theory. This is because counterpart theory incorrectly captures truths derivable from trans-world individuals. If one embraces modal realism, one embraces the falsity of Lewis' logic. The second is that the metaphysics of modal realism imply that humans will be epistemically ignorant in regards to whether or not the logic we create correctly reflect the logical truths present in modal realism. This is because alien worlds are epistemically inaccessible to humans. If one embraces modal

realism, one must accept that there are a great many logic debates that cannot be practically solved, for example, whether or not it is not possible for  $P \wedge \sim P$  to be true. The third is that, if one embraces modal realism, one must also accept that conceiving of possible worlds as maximal sums of spatiotemporally interconnected things means that possible worlds are not identical to 'the ways the world could have been'. This is because the actual world could have been something that contains two distinct spacetimes, even though there is no possible world that contains two distinct spacetimes. Hence, the modal realist must use a different conception of possible worlds to express the notion of 'ways the world could have been'. The fourth is, if one embraces modal realism, one must take the notion of *best suited* as a primitive within one's explanation of possible worlds. This is because possible worlds are the entities best suited to play the possible world role and Lewis offers no analysis of what it means for an entity to be better suited to play the possible world role. If what he means by best suited are, entities that preserve the most intuitions, then Lewis must accept that his theory offers no firmer metaphysical grounding for our judgments regarding possible worlds than theories that use possible worlds are heuristic devices. It is important to note that many of my arguments exploit Lewis' acceptance of trans-world individuals. The acceptance of trans-world individuals is a metaphysical fact about Lewis' view that is generally never talked about when discussing Lewis' view.

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