Problems for Modal Reductionism:
Concrete Possible Worlds as a Test Case

Jonathan Nassim

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Birkbeck, University of London

I hereby declare that the work contained in this thesis is entirely my own.

Jonathan Nassim

Abstract

This thesis is an argument for the view that there are problems for Modal Reductionism, the thesis that modality can satisfactorily be defined in non-modal terms.

I proceed via a case study of David Lewis's theory of concrete possible worlds. This theory is commonly regarded as the best and most influential candidate reductive theory of modality. Based on a detailed examination of its ontology, analysis and justification, I conclude that it does badly with respect to the following four minimal conditions on a satisfactory reductive theory of modality: that it be (a) genuinely reductive, (b) materially adequate, (c) conceptually adequate and (d) that its justification provides good reason to think it true.

These problems for Lewis's theory are not, I suggest, due to his idiosyncratic conception of possible worlds as *concrete* entities. Rather, because Lewis's theory can be seen to represent an important class of structurally similar reductive theories of modality, the problems for Lewis's theory generalise to problems for these other theories. This suggests that Modal Reductionism is unpromising. In the light of this, the alternative approach to understanding modality, Modal Primitivism, appears more attractive.

This thesis is dedicated to my family

Acknowledgements

The music-master praised the bird tremendously, and insisted that it was much better than the real nightingale, not only as regarded the outside with all the diamonds, but the inside too. 'Because you see, my ladies and gentlemen, and the emperor before all, in the real nightingale you never know what you will hear, but in the artificial one everything is decided beforehand! So it is, and so it must remain, it can't be otherwise. You can account for things, you can open it and show the human ingenuity in arranging the waltzes, how they go, and how one note follows upon another!' (Hans Christen Anderson, 'The Nightingale')

And now the question remains whether we would give up our language-game which rests on 'imponderable evidence' and frequently leads to uncertainty, if it were possible to exchange it for a more exact one which by and large would have similar consequences. For instance, we could work with a mechanical 'lie detector' and redefine a lie as that which causes a deflection on the lie detector. So the question is: would we change our way of living, if this or that were provided for us? – And how could I answer that? (Ludwig Wittgenstein, in Kerr 2008, 91)

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Chapter 1: Introduction

1.0 Modal Reductionism

I

Modal notions play a fundamental role in our lives and thought. Without them there is much we could not think or do. The connections between modality and the standard accounts of decision-making, free will and moral responsibility, abundantly illustrate this. On such accounts, decision-making involves deliberation about which of a range of *possible* actions should be performed, and the selection of one to perform.[1] Free will places a modal condition on decision-making: having a free will requires being free to choose to do a possible action, say *F*. We are free to choose to do *F* only if we *could* have chosen to do another possible action *G*. Finally, moral responsibility requires free will, for we are not morally responsible for actions with respect to which we *couldn't* have chosen otherwise. So modality comes into standard accounts of: (a) what we reason about when we deliberate, (b) what we aim to bring about when we act, (c) free will, and so (d) moral responsibility.

These connections suggest a rather platonic picture of humans: their rational minds can escape this earthly realm, and gain access to the paradise of possibility. In this realm an array of possible actions are contemplated and one selected to bring about by action. This platonic picture is supported by a long tradition which seeks to distinguish humans from other animals by virtue of our access to the realm of possibility, and the use we make of it in our lives. Often our access to it is tied to our linguistic capacities. For instance, Pettit holds that

> it is certainly unlikely that non-human animals live up to the picture [of decision-making as a matter of deliberation+decision]. According to this description, the options over which agents deliberate are *abstracta*, not *concreta*: they are ways things might be – ways the agent knows how to make things be – not actual events. Human beings can identify such entities on the

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[1] The possibilities we deliberate about might be thought of as *agential* possibilities, courses of action the agent

basis of how they answer to abstract linguistic specifications: my helping the beggar is that way things may be, under certain contextual constraints, which makes true the sentence 'I help the beggar.' But it is unclear how creatures without language could ever entertain options as objects of thought and ever deliberate about the features of such options.[2]

On such a view, animals lacking language lack modal concepts; and lacking modal concepts, they cannot grasp thoughts about different possible courses of action, at least not as such; and so they cannot choose between possible courses of action; so they do not have free wills; so they cannot be morally responsible agents. They are imprisoned in actuality. Our capacity to partly shape the course of our lives by stepping back from the actual has been contrasted with non-human animals, the course of whose lives is taken to be wholly dictated instead by instinct or desire. Just as grasp of thoughts about what is possible has been taken to be a mark of our humanity, so too has the grasp of thoughts about what is necessary. The intellectual grasp of the necessary truths of mathematics, logic, metaphysics and ethics are plausibly distinctively human achievements.

The connection of modality with both practical and theoretical concerns appears to mean that without grasp of modal notions, our ability to act and shape the world to fit our ends would be impoverished, for our understanding of the world would be impoverished. Bertrand Russell pictured the world as at bottom non-modal and so fully graspable without modal notions. This is a world in which

> propositions are simply true or false and there is no such comparative and superlative of truth as is implied by the notions of contingency and necessity.[3]

If this were our picture of the world, then we would appear to be blind to the modal facts. We would be able to encompass modal facts in our thought, but not as such. We could, for instance, imagine different ways the world could be, but fail to understand the imagined scenarios *as possible*; or we may think that a necessarily

[2] Pettit 2010, 256. See also Nicholas Rescher whose idealism leads him to the view that "the domain of possibility is the creation of intelligent organisms and is a realm accessible to them alone" (1979, 171).
[3] Russell 1994, 520.

true proposition which contains no overtly modal content – such as the proposition that 2+2=4 – is true, but fail to think of it as *necessary*. Or we could think that some event either happens or doesn't, but not think that it happens *contingently* or *necessarily*. Or we could think that something has or fails to have some property, but not that it does so *accidentally* or *essentially*. The non-modal picture of the world – which Kit Fine characterised as an "on-or-off" affair[4] – makes no room for *modes* of truth or existence, modes which appear fundamental to our ordinary characterisations of the world, and our understanding of ourselves as free, morally responsible agents in it. Such a picture, closed in upon the actual, threatens to deprive us not only of the resources to decide and act in the world, but also of access to distinctions that seem vital to characterise it as we find it.

II

Frank Ramsey said that

> Philosophy must be of some use and we must take it seriously; it must clear
> our thoughts and so our actions.[5]

Given the importance of modality to our thoughts and actions, in heeding Ramsey's advice we may start by clarifying our thoughts involving modality. How is that to be done? There are two very general philosophical approaches to clarifying concepts. A notion can either be *reductively analysed* or it can be *taken as primitive*. Both approaches connect the target concept with other concepts, but do so in very different ways.

A reductive analysis of a concept *k* defines it without making use of *k* or concepts which themselves can be defined in terms of *k*. We might think of a reductive definition as 'unpacking' the complex contents of *k*, or as 'separating' *k* into its constituent notions. By seeing what these constituents are and how they are related, our understanding of *k* is thereby illuminated. By contrast, taking *k* as primitive is a

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[4] Fine 2005, 1.
[5] Ramsey 1990, 1.

matter of treating it, in some theory T, as not being reductively definable in T.[6] Treating *k* as primitive doesn't, unlike a reductive definition, immediately illuminate *k*. Illumination is to be found, on this view, not by 'peering inside' *k*, but rather by understanding *k*'s *role* in the theory in question; understanding, that is, how *k* connects to other notions by, for instance, partially defining them. It is in this sense in the *consequences* of treating some notion as primitive that our understanding of it is improved.

To illustrate these different approaches, take the concept of knowledge, which has been treated in both ways. It used to be thought that it could be reductively analysed in terms of truth, belief and justification.[7] It is now taken seriously that knowledge should be taken as primitive, and that our understanding of knowledge is improved by showing what we can *do* with it.[8] For instance, Keith Hossack takes knowledge to come into the definition of various notions including: concept, content, reference, truth, necessity, consciousness, language, testimony and others.[9] On this primitivist view of knowledge, theorising *about* knowledge becomes theorising *in terms of it*, rather than *dissecting* it.

Disagreements about what the right theory in some area of philosophy is often come down to disagreement about which notions should be taken as primitive and which can be reductively defined. This point is particularly important in an intellectual climate in which a premium is placed on theoretical simplicity, which is partly measured by the number of types of primitive notions a theory employs (see Chapter 5 for discussion). Take for instance, the disagreement between Bertrand Russell and Donald Davidson about the conceptual priority of the notions of mind and truth. Russell takes the concept of mind as primitive, and uses it to illuminate the concept of truth. Truth, according to his correspondence theory, is defined in terms of a relation between a mental representation and a fact.[10] So the concept of mind figures in the definition of truth. Davidson, by contrast, takes the concept of truth as primitive, and uses it to illuminate the concept of mind. According to his

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[6] I understand a concept to *be* primitive if it does not admit of a reductive definition.
[7] For suggestive remarks see Plato's *Theaetetus*, 201d-210a and his *Meno* 98, in Plato 1997.
[8] This is partly due to the influence of Williamson 2000.
[9] Hossack 2007.
[10] See Russell 1951, 119-30.

interpretationism, to have a mind is to be able to speak a language, and to be able to speak a language is to be able to grasp content, and content is understood in terms of truth-conditions. So the concept of truth figures in the definition of mind.[11]

Which notions a philosopher takes to be primitive, and which not, typically reflects their deepest philosophical convictions. Materialists, for instance, will want to exclude any mental primitives from their theory; nominalists will want to exclude any abstract primitives; extensionalists will want to ensure there are no modal or other intensional primitives in theirs. There is in general no way of deciding, before theorising, whether a notion can either be reductively defined or else should be taken as primitive.[12] Whether, for instance, what is good is defined by God's will, or whether He wills the good because it is good, is a matter which might be advanced by trying to reduce the good in terms of God's will, and see where it gets you. Likewise with modality: the attempt to reduce it helps us come to a clearer view on whether it is primitive, and if so, why.

III

This thesis aims to explore the problems which arise when modal notions are treated as reducible to the non-modal. Modal Reductionism is the thesis that the concept of modality is ultimately definable non-modally. Modal Non-Reductionism is the denial of this thesis. Modal Non-Reductionism can be further divided into Modal Primitivism, the view that the concept of modality is coherent and primitive, and Modal Incoherentism, which is the view that the concept of modality is incoherent, and so neither primitive nor reducible.[13] In this thesis I take for granted the coherence of modal notions, and so set aside Modal Incoherentism.

Modal Reductionism is opposed to irreducible modality. It takes modal notions to be legitimate only in virtue of being defined by non-modal notions which are in good standing. Modal Reductionism is not to be confused with Modal Eliminativism, which is the thesis that modal notions should be excised from our theories

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[11] See Davidson 1984, 134-35. See also, Ellis forthcoming.
[12] Stalnaker makes this point in his 2012, 4.
[13] I sometimes, for ease of expression, write as if there is a *single* modal notion, and sometimes as if there are *several*. I don't mean to imply by this a stance on the issue of the number of (basic) modal notions there are.

altogether.[14] One motivation for Modal Eliminativism is the Quinean view that because science doesn't employ irreducible modality in its theories, we have no good reason to hold onto it in our philosophy. Modal Reductionism, on the contrary, is an attempt to *preserve* modal notions in a theoretical context in which they are not primitive. The reductionist and primitivist, unlike the eliminativist, agree on the theoretical *value* of modal notions, but see different ways of preserving them. The reductionist by fitting them *into* a non-modal theory, and the primitivist by fitting a modal theory *around* them.

The value that modal concepts have in philosophy – arguably reflecting their importance outside of it – can be seen in the central roles they play in the philosophical disciplines of ethics, logic, semantics, metaphysics, philosophy of action, philosophy of science, and others.[15] Modality is taken to come into the definitions of some of the core notions of these disciplines. For instance, in logic it is usually taken to be a necessary condition of a logically valid argument that its conclusion *must* be true if its premises are (equivalently: it is *impossible* for its premises to be true, and conclusion not true). The reductionist and primitivist both accept the centrality of modal notions to philosophy, their disagreement lies in whether, in the last analysis, it is correct to define them non-modally. Indeed, for both types of theorist, it is the prevalent use of modality throughout philosophy that provides the theoretical justification for reducing it or taking it as primitive.

Fine has suggested that the value of modal notions has been exaggerated. He diagnoses a condition called "modal mania", whose characteristic symptom is "seeing everything as modal".[16] We might distinguish two senses of 'modal mania': first, the view that modal notions – of some kind or other – come into the definition of many other philosophically significant notions; second, the view that *necessity* or *possibility* in particular (the notions formalised by the box and diamond) come into those definitions. But even if the value of modal notions has been exaggerated in one or other way, and modality comes into only *some* philosophically important notions,

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[14] While both theories may endorse the view that 'we can do without modal notions', the modal reductionist means we can do without *irreducible* modal notions, while the modal eliminativist means we can do without modal notions altogether, reducible and irreducible notions alike.

[15] See e.g., Lewis 1986, 3.

[16] Fine 2005, 9.

then it is still the case that whether modality is reducible or primitive is a fundamental question with important consequences for our thought both about modality itself and about the notions it helps to define.

IV

Ironically, one of the reasons for defining various concepts in modal terms in the first place – and so perhaps, one explanation for modal mania – was the impression that modal concepts were *not* ontologically committing, that they *didn't* function like quantifiers.[17] Modality seemed to be a way, particularly in the philosophy of mathematics and metaphysics, of saying what we want to say about, say, numbers or properties, without incurring commitment to dubious entities. This modalising strategy proved attractive and low-cost from the perspective of anti-platonist epistemology or nominalist metaphysics. The irony is that the now dominant view of modality is that it should be analysed in terms of quantification over possible worlds. The problematic status of these entities raises questions about the true cost of the modalising strategy. For while a modal analysis of, say, properties as sets of *possibilia* might avoid commitment to *some* troublesome objects – the properties – it brings with it commitment to *others* – the *possibilia*. Many of the same epistemic and metaphysical concerns about numbers and properties that motivated the modalising strategy in the first place, now infect the objects in terms of which numbers and properties were defined.

Quantificationism is the thesis that modal notions are ultimately to be analysed in terms of quantification, specifically, first-order quantification.[18] Quantificationism says nothing particular about the kind or kinds of objects modal claims quantify over; it is a thesis about the *structure* of modal claims, not about which objects *fill* the structure. Quantificationist theories typically take the following 'Leibnizian' bi-conditionals to capture *de dicto* modality:

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[17] See e.g., Putnam 1967, and Field 1989.
[18] By 'ultimately' I mean, in the *last* analysis. So Quantificationism is incompatible with the view that modal claims can first be analysed in quantificational terms, which are then *further* analysed in non-quantificational terms. Non-quantificationist theories may treat modal claims quantificationally, but treat them as a manner of speaking, to be ultimately understood in non-quantificational terms.

Possibly *p* iff *p* is true at some possible world *w*

Necessarily *p* iff *p* is true at every possible world *w*

where the interpretations of 'true at' and 'possible world' are left open for each variant of the view to specify.[19] The basic thought behind this approach to modality is that possibility claims are existential quantifications, necessity claims are universal quantifications – the rest is detail.[20] It is an *ontological* conception of modality: modal discourse is discourse about *objects*. Quantificationism is an instance of a general approach to a variety of concepts, which involves treating them as first-order quantifiers over a domain of objects. For instance, *Temporal* Quantificationism is the thesis that temporal discourse is really quantification over instants of time. The logical relations between temporal *notions* are explained in terms of the existence of instants of time and certain relations which hold between them.

A large class of reductive and non-reductive theories of modality agree with the view that modal notions are guided by the logic of the quantifier. Quantificationism, which cuts across the reductive/non-reductive distinction, comes in two versions: Reductive Quantificationism and Non-Reductive Quantificationism. Reductive Quantificationism is the thesis that modal notions are ultimately to be analysed in terms of quantification over possible worlds which are themselves definable without recourse to modal notions (see §6.1 for more discussion of this thesis). Non-Reductive Quantificationism treats possible worlds either as indefinable entities *classified as* irreducibly modal, or else as entities *definable in* irreducibly modal terms. The various different versions of Reductive and Non-Reductive Quantificationism are typically formulated by keeping the Leibnizian structure of the analysis more or less fixed, and varying the entities which are taken to play the role of possible worlds.

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[19] I leave aside *de re* modality to simplify my exposition. I also simplify by treating Quantificationism as the thesis that modal claims quantify over possible worlds. This is the dominant view, but there are other views we should rightly class as quantificationist, according to which modality is to be understood primarily in terms of quantification over possibilities which are incomplete or not fully determinate, meaning that the possibility doesn't determine for any proposition *p*, whether *p* or ¬*p*. Rumfitt, for instance, holds that possibilities are best thought of as ways things might be, not *fully determinate* ways things might be. He explains why he thinks this as follows: "since I am unsure whether there is even a fully determinate way things actually are, I prefer to avoid commitment to possible worlds" (Rumfitt 2010, 55). See Hale 2013, 230-31, and Humberstone 1981.

[20] For a similar point see Dunaway 2013, 152-53.

Before Saul Kripke's seminal work in providing a semantics for modal logic,[21] there were two dominant competing approaches to reducing modality. The first was the traditional rationalist view that modality is *apriority*; on this view, modality is not a notion drawn from ontology, but from epistemology.[22] The second was the view that modality is *analyticity*; on this view, modality is a notion drawn from semantics.[23] Since Kripke, however, Quantificationism has dominated the field; rather than ask which kind of analysis of modality is correct, philosophers began asking which *version* of Quantificationism is correct. And since Kripke, Reductive Quantificationism has become the standard way to implement Modal Reductionism.

The original motivation for treating modal notions as quantifiers likely came from noticing analogies between our modal, temporal and quantificational discourse.[24] Specifically, between the notions of *all*, *always* and *necessarily* and likewise *some*, *sometimes* and *possibly*. These analogies led philosophers to take seriously the thought, as Arthur Prior put it (without endorsing the view), that

> the modal expressions 'necessarily' and 'possibly' are disguised quantifications of some sort.[25]

The analogies indicate that modal and temporal discourse disguise a hidden parameter: a *possible world*, or *instant of time* variable over which modal and temporal notions quantify. I won't go through all the analogies here, but I mention two by way of illustration.

First, modal, temporal and quantificational notions have 'strong' and 'weak' forms. The strong form: 'Necessarily p' implies, but is not implied by 'p'. 'Always p' implies, but is not implied by 'p'. 'For all x, fx' implies but is not implied by 'fa'. The weak form: 'Possibly p' does not imply, but is implied by 'p'. 'Sometimes p' does not imply, but is implied by 'p'. 'For some x, fx' does not imply, but is implied by 'fa'.

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[21] See Kripke 1963.
[22] For a contemporary defence of this position see Hossack 2007 and forthcoming. Elements of the 'modality is *apriority*' view also exist in Edgington's 2004.
[23] For a contemporary defence of this view see Sidelle, 1989.
[24] See Cresswell 2014 for a historical overview.
[25] Prior and Fine 1977, 10.

Second, the way modal, temporal and quantificational concepts interact with truth-functional connectives also run in parallel. For instance, 'necessarily', 'always' and 'all' distribute over implication. From 'Necessarily (if p then q)' we can infer 'If necessarily p then necessarily q'. From 'Always (if p then q)' we can infer 'If always p then always q'. From 'Anything, if it is f, is g' we can infer 'If everything is f, then everything is g.'[26]

The widespread acceptance of Temporal Quantificationism, and its ontological commitment to instants of time gave succour to quantificationist treatments of modality. Modal and temporal claims came to be understood ultimately in terms of non-modal or non-temporal claims being *true of* possible worlds or instants of time.[27] If analyses of modal and temporal claims are cut from the same pattern, and if temporal claims are understood in terms of quantification over instants of time, and so incur commitment to these instants, it seems hard to resist both the view that modal claims quantify over possible worlds, and so are committed to their existence. If we are not instrumentalists about instants of times, what would warrant going instrumentalist about possible worlds?

Despite the powerful analogies, and despite the theoretical power of possible world semantics, it is still possible to resist their pull. Prior, for instance, accepts the analogies, but takes them to teach the *opposite* lesson from the one that is standardly taken. On his view, rather than think of modal logic as quantificational logic in disguise, the reality is quite the opposite: quantificational claims are really *modal* claims in disguise.[28] I won't develop this intriguing view, but that it exists is worth bearing in mind. For it raises the prospect that the very idea of an object is modal; if so, then the quantificationist strategy for reducing modal discourse to discourse about non-modal objects is self-defeating, even if it can be carried through.[29]

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[26] This closely follows ibid., 15.
[27] Ibid., 103.
[28] Ibid., 10-11
[29] For a connected view see Hale 2013, 32.

1.1 Concrete possible worlds as a test case

I

In this thesis, I look at the prospects for Modal Reductionism by examining David Lewis's theory of modality as a test case. We might think of Lewis's theory as a materialistic reduction of modality.[30] Just as he attempts to fit the mind into a theory in which there are no irreducibly *mental* entities,[31] so he attempts to fit modality into a theory in which there are no irreducibly *modal* entities. According to his theory of modality, there exist an infinite number of *concrete* possible worlds and our modal notions are quantifiers over them.[32] So he is a reductive quantificationist. It is the concreteness of Lewis's worlds which primarily distinguishes his position from the more common quantificationist view that possible worlds are abstract entities of some kind.[33]

We can think of Lewis's perceived need for worlds as arising from two sources: Quinean, and anti-Quinean. The first is his commitment to the Quinean project of analysing any notion worth its salt in first-order terms, according to which if a non-logical notion is to be analysed, it must be a matter of quantification over entities for which a criterion of identity can be given. Worlds, understood as concrete objects, appear to fit the bill. The second source is Lewis's anti-Quinean enlargement of the range of beliefs which philosophy ought to take seriously. For Quine, our non-scientific beliefs need not be incorporated into the systematic theory of the world which it is, he thinks, philosophy's job to build. For Lewis, on the other hand, theorising must respect as many of our beliefs as possible, scientific and non-scientific alike, and that includes our modal beliefs. This leads to Lewis expanding the range of notions which, prima facie, *are* worth their salt to include modal

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[30] Throughout the thesis I distinguish between the *ontology* of Lewis's theory of modality, that is, the objects it postulates, from its analysis, that is, its reduction of modal notions. Lewis's theory as a whole comprises the ontology and analysis.
[31] See Lewis 1983, 99-107.
[32] I will refer to Lewis's concrete possible worlds as simply 'worlds' and reserve 'possible world' as a placeholder which various theories of modality fill in with different entities. For Lewis's definition of worlds see §§2.0-2.1.
[33] For a qualification of this view of concrete worlds, see Lewis 1986, 75-76. Their concreteness amounts to their being composed of objects standing in spatio-temporal relations, and so appear to allow for a reduction of modality.

notions.[34] The problem then arises that the physical world doesn't appear to have enough in it to sustain the truth of our modal discourse.[35] So given Lewis's reductive quantificationist analysis, he seems compelled either to admit non-modal non-concrete entities for modal discourse to be about, or else say that our world is but a small part of concrete reality – and of course he chooses the latter.

We can divide Lewis's theory into an ontology of worlds, and an analysis of modal notions in terms of these worlds. The *ontology* – which Lewis calls 'Modal Realism' and I sometimes call 'Lewis's ontology' – postulates a plurality of worlds, entities of the same kind as our universe.[36] Modal Realism shouldn't be confused with the whole of Lewis's theory of modality. It is, he writes, simply "an existential claim".[37] The *analysis* – which I sometimes call 'Lewis's analysis' – interprets modal claims as quantifying over these worlds. The theory is that logical space is constituted by the totality of concrete worlds – 'the pluriverse' – and modal claims represent states of that space.

This framework provides what Lewis needs to attempt a rehabilitation of modal notions in a first-order extensional language which lacks primitive modal vocabulary. But there is a suspicion that, as Fine put it, "*au fond*, Lewis is as sceptical of modal notions as Quine."[38] I will find, in this thesis, that there is much to recommend Fine's thought, though I complicate it by arguing, in Chapter 3, that Lewis's theory in fact requires the very modal notions it appears sceptical of (see §3.3 and §3.51).

II

Why use a test case? I initially wanted to approach the question of whether Modal Reductionism is a plausible thesis as an argument from elimination: taking the full range of plausible candidate reductive theories, I aimed to examine each of them,

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[34] See Loux and Zimmerman (2003, 1-7) for discussion of this point and relevant references.
[35] See Fine (2005, 1-2) for this point.
[36] Lewis 1986, 2. There is, in Lewis's theory, no categorical distinction between the actual world and other worlds. In whatever sense our world exists and is real, so too are the others. His ontology is, in this sense, flat or egalitarian. A possible world is just a world; a possible individual is just an individual which is part of a world.
[37] Lewis 1986, viii.
[38] Fine 2005, 2.

and determine whether they satisfactorily reduce modality. I soon discovered this project was too large, but also that a detailed study of Lewis's theory could throw considerable light on a number of structurally similar theories.[39]

But why train a test case on *Lewis's* theory in particular? The idea that doing so could provide some general illumination would appear to be shot down by Lewis's own admission that

> if the common suspicion of possible worlds…were justified, then my analysis could have little interest...[40]

By 'possible worlds' Lewis here refers to the worlds of his theory, that is, universes such as the one we inhabit. Given that people still *are* sceptical of such worlds other than our own, isn't he right to think that this scepticism would drain his analysis of modality of interest?[41] The answer to this and the reasons his theory is worthy of serious study are as follows. Despite the widespread scepticism directed at Lewis's ontology, (1) his theory and the methodology that animates it and comes into its justification are hugely *influential*, (2) his theory is the *best regarded* candidate reductive theory, and (3) it is *representative* of reductive quantificationist theories of modality. These points – which I elaborate below – mean that Lewis's theory is well suited to be a test case for Modal Reductionism.[42]

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[39] There appears to be a pattern amongst post-Kripke theories of modality: they treat modal notions in quantificational terms, only really disagreeing about *what* they quantify over, and what the *precise* form the analysis should take. Lewis's theory is a reductive implementation of this quantificationist pattern.

[40] Lewis 1973, 84.

[41] See e.g., Sider 2003, 187 and Williamson 2013, 18.

[42] A *personal* reason why Lewis takes centre stage is that I find his theory the simplest and clearest of any theory of modality. I take the following points Moore gives as reasons to study Utilitarianism, as similar to the reasons I believe it worth studying Lewis's theory of modality. He writes: "One great difficulty which arises in ethical discussions is the difficulty of getting quite clear as to exactly what question it is that we want to answer. And in order to minimise this difficulty, I propose to begin…by stating one particular theory, which seems to me to be peculiarly simple and easy to understand. It is a theory which, so far as I can see, comes very near to the truth in some respects, but is quite false in others. And why I propose to begin with it is merely because I think it brings out particularly clearly the difference between several quite distinct questions, which are liable to be confused with one another. If, after stating this theory, we then go on to consider the most important objections which might be urged against it, for various reasons, we shall, I think, pretty well cover the main topics of ethical discussion, so far as fundamental principles are concerned" (1975, 5).

III

(1) *Influence*. Fine writes that "our current thinking about modality…has been heavily influenced, one might even say dominated" by the views of W.V. Quine and Lewis.[43] I believe the influence Lewis has had on current thinking about modality is not so much from *what* his theory says – in particular, that there exist a plurality of worlds – but rather from *how* he theorises about modality and how he justifies his theory. Robert Stalnaker puts this point as follows:

> while most philosophers reject David Lewis's modal realism, most have accepted his way of framing the debate about possible worlds.[44]

This 'framing' involves three guiding assumptions. First, theorising about modality should take the form of a reductive conceptual analysis, because a central aim of theorising is to decrease the number of primitive notions a theory employs, and thereby unify it. Second, it should aim at giving the truth-conditions of modal discourse in a first-order language. Or, as Timothy Williamson more colourfully has it,

> The effect of Lewis's influential and ingenious system-building was to keep centre stage a view that imposed Quine's puritan standards on modality long after Quine's own eliminativist application of those standards had been marginalised.[45]

Third, the theory should be justified and judged in terms of a trade-off between its simplicity and fit with current beliefs. Here is Stalnaker again, noting his concerns about Lewis's methodology, but confirming its influence:

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[43] Fine 2005, 1.
[44] Stalnaker 2012, 10. Similarly, in a discussion of philosophical methodology, Oliver writes that "Lewis's work on metaphysics has had an overwhelming influence on subsequent investigations" (1996, 2).
[45] Williamson 2013, xiii.

I have alluded to the cost-benefit, reflective equilibrium methodology that Lewis articulated and made fashionable, but I have my reservations about this way of thinking about the way philosophical alternatives are evaluated.[46]

Not only is Lewis's theory of modality influential in the above respects, but so too are his other works – many of which are applications of his Modal Realism. This is a view supported by Peter Unger, who holds that Lewis is

by far the most influential philosopher over the last fifty years. No one else comes close…[47]

Unger's view is supported by a study of citations in top philosophy journals from 1993-2013 by the sociologist Kieran Healy. She concludes part of her study – which places Lewis's *On The Plurality of Worlds* (henceforth '*OPW*') as the second most influential book, after Kripke's *Naming and Necessity* – with the following:

No one else comes anywhere near…[Lewis's] level of influence….For someone who didn't intend to be a systematic philosopher, Lewis certainly ended up having a systematic effect.[48]

(2) *Best regarded*. Whether Lewis's theory *is* the best candidate reductive theory is not clear without examining his theory and comparing it to rival theories. What is clear is that his is widely *recognised* as being the best available candidate reductive theory. Though few can bring themselves to believe Lewis's theory, the high regard in which it is held by philosophers who are themselves held in high regard, is at least a reason to take it very seriously. Below are a few examples. Ted Sider, for instance, writes:

Lewis's analysis of modality is compelling and comprehensive…Hard as they are to accept, *only* Lewisian possible worlds allow a non-circular analysis of possibility and necessity; that is their great advantage…[49]

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[46] Stalnaker 2012, 5.
[47] Unger in Boey 2014.
[48] Healy 2013.
[49] Sider 2003, 193, my italics.

Joseph Melia is likewise impressed by Lewis's analysis:

> the theoretical benefits of…[Lewis's]… theory of modality are enormous. All the benefits of possible worlds semantics, the analyses of our modal thought and talk, the analyses of counterfactuals and the like are all available to the extreme modal realist.[50]

He goes on to give

> thanks to David Lewis, who has forged [Modal Realism]…into the most comprehensive, comprehensible and detailed theory of possible worlds, one can now see that extreme realism [that is, Modal Realism] offers the greatest benefits of all possible worlds theories currently on offer. Indeed, arguably, it is the one theory that truly delivers on all counts.[51]

Ross Cameron concurs:

> The most well worked out attempt at a reduction of the modal to the non-modal remains David Lewis's Modal Realism.[52]

Jessica Wilson offers a more qualified endorsement:

> Not everyone has reductive ambitions, but supposing one does, Lewis's…appears to be the best game in town; and even those not inclined towards modal reductionism can acknowledge that *if* one can generate the space of metaphysical modality in non-modal terms, that would be a win from the perspective of ontological and/or ideological parsimony.[53]

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[50] Melia 2003, 121. See also ibid., 110.
[51] Ibid., 102.
[52] Cameron 2012, 1.
[53] Wilson forthcoming.

Finally, on Bob Hale's measured view, Lewis's analysis is the "most promising – and indeed the most prominent – approach to modal reduction…"[54] Further evidence of the good repute of Lewis's theory is that his analysis is often used as a *benchmark* for testing the quality of other analyses. Showing that some analysis is equivalent to his, is widely accepted as showing that it is a *satisfactory* analysis.[55]

(3) *Representative*. A final reason to use Lewis's theory as a test case for Modal Reductionism is that it can represent, in a range of respects, a number of similar theories to it. Lewis's theory shares a common structure with reductive quantificationist theories: (a) a range of entities are postulated, and (b) modality is reductively defined in terms of quantification over these entities. We may expect that if, as I take to be the case, the central problems for Lewis's theory are not primarily due to what is peculiar to it – for instance, the *concrete* nature of his possible worlds[56] – but are rather due to its structure, then we may expect that these problems will most likely also exist for theories with the same structure.

IV

This thesis locates several problems for Lewis's theory by asking how his it does with respect to the minimal conditions I outline in §1.2. I will argue that his theory appears to do badly with respect to these conditions, and assuming that the conditions are reliable, they indicate problems for this theory. In brief, these problems are that his theory appears (a) not to fit with our view of the *truth* of certain modal claims, (b) not to fit with our view of the *content* of certain modal claims, (c) not to be genuinely reductive of modal notions. Finally (d) the justification Lewis advances for his theory is unsatisfying. I argue, in Chapter 6, that these conclusions can be generalised to other theories, which supports the view that there are problems for Modal Reductionism. I will suggest at the end of this thesis that Modal Primitivism doesn't appear vulnerable to the problems of Modal Reductionism, and seems to be a more promising alternative to it.

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[54] Hale 2013, 70.
[55] See e.g., Rosen 1990 and Hossack, forthcoming, who both use Lewis's theory as a benchmark.
[56] Other accusations against Lewis's theory that I set aside, which are also about its ontology, include: that it is profligate, that it is inconsistent with the results of physics and that we cannot know about the existence or nature of worlds. For these points see Sider (2003, 187), Williamson (2013, 18) and Rosen (1990, 339-40), in that order. In this thesis I focus less on problems with Lewis's worlds than problems with what he does with them.

1.2 Testing reductive theories of modality

I

This thesis uses Lewis's theory of concrete possible worlds as a test case for Modal Reductionism. I understand modal reductionist theories as attempts to give conceptual analyses of modality. What is wanted, generally speaking, from such reductive theories of modality? Such theories should illuminate our modal notions by means of a reductive analysis. Theories which meet the following four minimal requirements are good candidates for doing so.

(A) A conceptual analysis of modality must be part of a theory that at least preserves what we *take* the truth-value of modal claims to be – it must not fly in the face of our modal intuitions about the modal claims we would be inclined to say are *true*, under suitably reflective conditions. While this requires that the theory validate our pre-theoretical view of the truth of these claims, it doesn't require that their meaning or truth-conditions are validated by the theory

(B) A further demand on conceptual analyses of modality is that they must be *faithful* to our modal concepts – they must not fly in the face of our intuitions about what the meaning or truth-conditions of our modal claims are, under suitably reflective conditions. A theory may accurately model *patterns* of belief – understood, for instance, as patterns of assent or dissent – while being unfaithful to the content of belief. Consider, for instance, discourse about rabbits. A theory of our rabbit-talk may preserve the pre-theoretic view of the truth-value of rabbit-talk, by identifying rabbits with numbers. Such a theory would be unfaithful to our concept of rabbit, which is the concept of an animal, not a number.[57] There are very many theories which can correctly reproduce our patterns of belief, but which fail to capture what we mean by those claims.

(C) There are two parts of a theory, and if a theory is to be reductive, no part of it may employ irreducibly modal notions. This means neither the analysans of an

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[57] For more on rabbits, see Quine 1960, 29.

analysis of modality nor its ontology may employ modal notions which are irreducible by the analysis.

(D) Finally, it is a plausible scenario that a range of candidate reductive theories of modality which purport to meet the requirements (A)-(C) are available. If only one of them can be true, we need a distinctive reason to think some *particular* one is. We require, in short, a *justification*. In such competitive theoretical contexts, such reasons typically invoke theoretical or methodological considerations, having the form: the best theories are *f* (where *f* may be a property of, for instance, simplicity, coherence or explanatoriness etc., or some weighted combination of them) and that *this* theory is the *f*-est.

II

I will now say a little more about each of these requirements. The first requirement a modal reductionist theory must meet is that it on the whole preserves our modal beliefs. This is the *material adequacy condition*. Though we cannot directly test for the *truth* of a theory of modality, we can test, at least for a range of important cases, whether it preserves our *assignments* of truth or falsity to modal claims. By analogy: if we want to assess whether superluminal flight breaks physical laws, we don't go to the laws *themselves*, and ask if superluminal flight breaks *them*, we go to what we *take to be* the laws. Material adequacy is a condition which is defined relative to a body of belief; it requires that the theory's verdicts roughly conform to that body of belief.[58] That is, for any modal belief we have, the theory should not say it is wrong; and for modal claims about which we are undecided, it is best that the theory does not issue a clear verdict one way or the other, and so reflects our own neutrality with respect to the claim in question.

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[58] We evaluate the material adequacy of a theory by reference to *our* beliefs. And while we have a potential infinity of modal beliefs, we can test only for a small finite number of them, typically paradigm cases. So we check to see if the modal facts according to *us*, match the modal facts according to the *theory*. This requirement is inherently conservative, favouring theories which agree with our picture of modal reality – to the extent this is represented by the way we distribute truth-values over modal claims – as against those which revise it. This conservatism might perhaps be explained by a (metaphysical) background assumption that our beliefs are, by and large, correct, or by the (epistemological) view that we have no better way of testing a theory than against our beliefs.

Material adequacy is not hard to achieve if we place no constraints on the theory's ontology in terms of which it analyses modality. All that is required is that this ontology co-varies in the right way with our patterns of modal belief. The theory's model need not be the *intended* one to do this job; indeed many models may do the job equally well.[59] This indicates what a thin notion material adequacy is. A theory is materially adequate just in case for any given modal proposition *p* which we believe, the theory entails the truth of an analysis of it, *q*.[60] But there need exist no other connection – for instance, conceptual, metaphysical, epistemic – between *p* and *q*. All that is required is that the truth-value of *p* and *q* match.

III

Further constraints on a theory of modality are required for it to give a correct conceptual analysis. It might be thought that widening the scope of material adequacy will do the trick. Material adequacy requires that the theory of modality conserve our *modal* beliefs; we might now add that it should not violate too many of our other beliefs either.[61] Widening the scope of material adequacy doesn't provide any assurance that the resulting analysis will be faithful to our concepts, for the aim is overall theoretical benefits which might be served best by mutilating our original concepts.

The *conceptual adequacy condition* is designed to narrow down the class of materially adequate theories to those which are faithful to our modal concepts. For instance, it rules out an analysis of our concept of rabbit in terms of number, because our concept of rabbit is not a numerical concept. Our understanding of the concept to be analysed can be exploited to rule out theories which are unfaithful to it.[62] The conceptual adequacy condition is used to preserve our beliefs in the following rich sense that Oliver notes:

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[59] See Menzel 1990, 372.

[60] There are two general ways a theory of modality can fail to be materially adequate: First, if we have modal beliefs it fails to analyse *at all*, and second, if it fails to assign a modal belief the expected truth-value.

[61] Lewis subscribes to this conservative view, adding that the more important beliefs count for more and incur a higher cost of violation (1986, 133). The famous 'incredulous stare' objection to Lewis's theory he took to express the view that his theory disagrees with ordinary views about *what there is* (ibid., 133), not disagreement over the modal facts.

[62] Lewis employs just this technique in his 1973, 86, 90 and in his 1986, 184.

The preservation of common-sense beliefs is the preservation of two things at once: the truth and the content of those beliefs.[63]

As the rabbit example indicates, if the take theories that aim to preserve the truth to also be preserving the content of belief, then we will be taken far astray. Adding the conceptual adequacy condition to our minimal conditions expresses the fact that it is not enough for a theory of modality to merely validate the truth of our modal claims, but it must do so in the right *way*, preserving their meaning. The condition aims to ensure that our original modal notions are not unrecognisably distorted in the pursuit of a good theory.

It might be useful might think of the difference between conceptual and material adequacy as the difference between sense and reference. As John Searle writes

You can get a mapping of one sentence onto other sentences where each side has the same truth conditions. But that is not, in general, the right way to understand the *sense* of the original sentence.[64]

The mapping preserves truth, but not sense.[65] Whereas in a conceptual analysis the aim is to preserve the sense of a sentence, not merely its reference where this is thought of as truth-value. For instance, while 'x is trilateral' may be a materially adequate analysis of 'x is triangular', for it preserves reference, it is not a conceptually adequate analysis, because it fails to preserve sense.

The conceptual condition for modal theories can be stated roughly as follows: a theory of modality is conceptually adequate iff for any modal proposition *p* which we believe, the proposition *q* which analyses it is *faithful* to *p*. The trouble is how to be more precise about when a theory is faithful to the content of our beliefs, and providing criteria for recognising it to be. It is sometimes, as in the rabbit example, easy to see when an analysis *isn't* faithful – it seems *obvious* that this analysis gets

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[63] Oliver 1996, 4-5. He continues: "So rejection may take two forms: preserve the truth but change the content, or keep the original content and declare it false" (1996, 4-5).
[64] Searle quoted in Crane 2014, my italics.
[65] Though this somewhat depends on what precisely you take a truth-condition to be. For a useful discussion see Hale 2013, 66-69.

the content of rabbit claims wrong – but this gives us no handle on when it *is*, or a reflective understanding of *why* it either is or isn't.

The notion of a theory being faithful to the content of our beliefs can be cashed out in various ways. One dominant one is that for a theory to be faithful to our beliefs it must provide the intended interpretation of those beliefs. Quine's problem with possible worlds was that it was unclear how they could provide this interpretation. He wrote that

> Possible worlds did indeed contribute to the semantics of modal logic, and it behoves us to recognize the nature of its contribution: it led to Kripke's precocious and significant theory of models of modal logic. Models afford consistency proofs; also they have heuristic value; but they do not constitute explication. Models, however clear in themselves, may leave us still at a loss for the primary, intended interpretation.[66]

Quine, it appears, is sceptical of possible worlds or any other models as providing the intended interpretation of modal discourse because he is sceptical of the coherence of the modal notions they purport to interpret. If we want to know what modal discourse is about, a mathematical model which can be used to preserve what we take to be the truth-values of its sentences is certainly not enough.[67] The trouble is that there is no agreed procedure for determining when an interpretation is the intended one. Putting the question of when an analysis is faithful to the target concept in terms of when an interpretation is the intended one doesn't seem to advance the issue. We need *criteria* to determine when a theory is faithful to the content of our beliefs. Suggestions include, that the theory yields an analysans which (a) says the same thing as the original proposition, or (b) figures in our inferences in the same way as it, or (c) embeds in propositional attitude contexts in the same way as it, or (d) is known in the same way as it or (e) conforms to some specified set of

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[66] Quine 1972, 492.

[67] The following point of Rosen's about his fictionalism is relevant here: "I have supposed that fictionalism, like modal realism, aims to be a theory of possibility...But note that this assumption is not strictly necessary given the modest problem we began with…[which was to obtain]… license to move back and forth between modal claims and claims about worlds…[I]t is one thing to embrace these biconditionals – even to embrace them as a body of necessary truths – and another to regard them as providing analyses…" (1990, 353-54).

intuitions about the topic in question. I suggest the least controversial of these suggestions is (a). Vague as it is, it is a plausible constraint on descriptive conceptual analyses. (For instance, Searle's point above seems to presuppose it.) In Chapter 4, §4.0, I provide three further plausible criteria we may expect an analysis of type (a) to meet.

IV

The *reduction condition* is the requirement that a theory of modality be reductive. This means the theory cannot contain modal resources which it cannot itself reduce. So no irreducible modal notions – irreducible, that is, relative to the theory in question – can be employed by the theory. There are four points to note about this condition.

First, the classificatory question of which notions are *modal* is contested. Some notions – such as alethic necessity and possibility – everyone accepts as modal. As we move further away from these paradigms, to for instance, essence, disposition, the counterfactual and non-alethic modals, things become less clear. It is common to, at least initially, treat all these notions as modal. Theorists may, if they have them, use their favourite definitions of modality to refine the classification. I will stick to the liberal classification which treats of all these notions, and related ones, as modal.[68]

Second, a theory fails to be reductive when it contains irreducible modal notions. For a theory to contain such notions is a matter of it either containing a circle of inter-defined modal notions, none of which admit of a reduction, and so no way of breaking into the circle exists, or else containing primitive notions which are classified as modal.

Third, modality can be concealed in a theory in various places. It is normal to focus attention on the concepts in the analysans, and hunt there for covert circularity. But it is no less important to look at a theory's ontology to see if *it* contains irreducible

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[68] Here I follow Hale 2013, 63 fn.1.

modal notions. What matters for the reduction condition is that the theory *as a whole* – its analysis and ontology inclusive – does not employ irreducible modal notions.

Fourth, a theory of modality may itself make use of modal notions, so long as it exhaustively reduces them. If a theory makes use of modal notions but only reductively defines *some* of them, this is not enough, for then there will be remainder modal notions lacking reductive definitions. A connected point is that reductive theories of modality are under no obligation to reduce every modal notion there is – they are only under obligation to reduce any notion in their machinery, together with any modal notion they *recognise*. So it is no criticism of a candidate reductive theory, from the point of view of the reduction condition, that it can reduce the notion of *necessity*, but not, say, the notion of *essence*. Of course such a theory may fail from another standpoint, but not from the point of view of the reduction. It is worth emphasising here that 'Theory T reduces concept *k*' does *not* mean that T *successfully* reduces *k*. The reduction condition doesn't care about whether a theory is *successful* in other terms – for instance, true or perhaps, materially or conceptually adequate – it cares only whether it is *reductive*.

V

Facts about a theory, for instance that it satisfies the above minimal conditions, is not yet a reason to *believe* it, until satisfaction of the conditions are understood to be indications of truth. Theories of modality exist in a highly competitive theoretical space, where rivals purport to have met conditions similar to the material, conceptual and reduction conditions – and these are just the *actual* rivals, there are many more *possible* rivals! Faced with an array of theories to choose between, we need a reason to prefer one theory rather than the others. The justification condition places a very minimal requirement on a putative reason: it should raise the probability of the truth of the theory it justifies. For instance, if it is accepted that simpler theories are more likely true, then to show that T is simple raises the probability of T's truth. A good reason provides us with a reason to believe that the theory is *true*; it is *a* reason, not necessarily a *decisive* one, for other reasons may outweigh it. Such reasons are typically theoretical or methodological in nature – and so call for some theoretical or methodological explicitness about what is wanted from a theory and why.

Theories are often justified by aesthetic or pragmatic reasons.[69] But these are only reasons to *believe* a theory if they are epistemically relevant.[70] For some desirable aesthetic or pragmatic property of a theory *F*, possessing *F* only provides a reason to believe a theory if *F* raises the probability of its truth. This needs to be shown – though invariability isn't – before aesthetic properties such as simplicity can legitimately be used as reasons to believe.

1.3 Thesis outline

This thesis is divided in two: the frame (Chapters 1, 6) and the test case (Chapters 2-5). The frame provides the context of the test case, and suggests conclusions we can draw from it. The test case itself is divided into three main parts[71] each focusing on one aspect of Lewis's theory: its ontology (Chapter 3), its analysis (Chapter 4) and its justification (Chapter 5). These strands are tangled together in a tight knot in Lewis's work. I aim, perhaps artificially, to disentangle them and critically explain the contribution of each to his theory. Each of the test case chapters consist of two parts: an expository first part, and a critical second part. In each of these chapters I ask to what extent Lewis's theory meets the minimal conditions for a reductive theory of modality as laid out in the previous section. The plan of the thesis is as follows.

In Chapter Two 'Lewis's theory of modality', I provide a simple exposition of three aspects of Lewis's theory: its ontology, its analysis and its justification. I aim to clarify some of the interactions between its ontology of worlds and its analysis of modality. The chapter provides a skeletal understanding of Lewis's theory, on which later chapters build with further exposition and critique.

In Chapter Three 'Ontology', I suggest that Lewis's theory can neither satisfy the reduction condition nor the material adequacy condition. The argument focuses on Lewis's ontological postulate that there exists an abundance of worlds. There

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[69] See Kriegel 2013 and Oliver 1996.
[70] On epistemic justification see Bonjour 1978, 5.
[71] I set aside Chapter 2, which is a simple exposition and discussion of Lewis's theory.

appears no way to specify this claim such that it sustains the material adequacy of the analysis, without recourse to irreducible modal notions. The best way Lewis comes up with, his 'Principle of Recombination', is implausible, for (a) to generate enough worlds it requires irreducible modal notions, and (b) it is committed to the Humean denial of necessary connections, so distorts the facts of modality. The former problem suggests the theory is not reductive, the latter problem suggests the theory is not materially adequate.

In Chapter Four 'Analysis', I argue that Lewis's theory appears not to satisfy the conceptual adequacy condition. The argument here focuses on Lewis's analysis as a *conceptual* analysis. If our modal concepts are quantifiers over worlds, as Lewis suggests, then (i) there should be an *a priori* conceptual connection between modal and worldly claims, (ii) our understanding of the worldly claims should be sufficient for our understanding of modal claims, and (iii) the ontological commitments of modal and worldly claims should be identical. I first find that Lewis's arguments for the *a priori* conceptual connection leave much to be desired, and then argue, that Lewis's analysis appears neither to deliver on (ii) nor (iii). This suggests that modality is not to be understood in terms of quantification over worlds.

In Chapter Five 'Justification', I argue that Lewis's main justification for his theory is unsatisfactory as it appears not to provide a good reason to believe and so it appears not to satisfy the justification condition. Lewis holds that because his theory requires fewer primitive concepts than his rivals, we have a reason to think it true. He thinks that a theory is better, all else being equal, if it contains fewer primitives. The justification for this principle is that a theory containing fewer primitives provides a better – more unified and economical – systematisation of our beliefs. I argue that this justification doesn't provide a reason to think Lewis's theory is true, for it relies on three problematic assumptions: (1) that our beliefs form a unity, (2) that our beliefs and systematisations of them can be compared to determine the number of primitive notions they contain, and (3) that Lewis's view of what the costs and benefits of theories are, and what grounds them, is correct.

Finally, in Chapter Six 'Conclusion', I summarise the results of the test case. I then argue that the results may be carefully generalised to apply beyond Lewis's theory,

to theories which are of a similar structure or which employ a similar justification. This builds the case for the view that not only are there problems for Modal Reductionism in virtue of its most influential and best regarded candidate having problems, but there are also problems because other similar theories appear to have similar problems to Lewis's. I conclude by suggesting that Modal Primitivism offers an approach to modality which seems not to be vulnerable to these same problems, and is worthy of serious consideration.

Chapter 2: Lewis's theory of modality

In this chapter I lay out the ontological, analytical and justificatory foundations for the case study of Lewis's reductive theory of modality. I first outline the skeleton of Lewis's theory, clearly distinguishing its two main parts: its ontology of worlds and analysis of modality (§2.0). Later chapters will add flesh to its bones, as I discuss and critique it. I then clarify what the theory says, and explore the relationship between its two parts (§2.1). Finally, I outline Lewis's justification of his theory by situating it in its theoretical setting (§2.2).

2.0 Lewis's theory of modality

I

Lewis's theory is best approached by dividing it into two parts: an ontology of worlds and a conceptual analysis of modality in terms of them.[72] Doing so allows us to later distinguish ontological from analytical criticism of the theory. Lewis himself usually formulates his theory by dividing it into these two parts, and I stick fairly closely to his own formulation of it.[73] I start with the ontology, for it is in terms of this ontology that the conceptual analysis of modality is given. Several of the technical terms used below will be clarified in the following sections.

II

Ontology. Modal Realism can be roughly stated by the following claims:

> (i) There exists a plurality of worlds, where 'world' is defined as follows: x is a world iff x is a maximal spatio-temporally interrelated fusion.[74]

To analyse modality, the plurality of worlds must be abundant. To state this abundance, Lewis appeals to a principle of plenitude for worlds (see §3.1 for

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[72] This bipartite division of Lewis's theory is particularly clear in Divers and Melia's regimentation of it in their 2002.
[73] Lewis 1986, vii, 3-5.
[74] See ibid., 73.

discussion of this principle). Lewis changed his mind about what the correct formulation of this principle is.[75] He first used the principle I call 'Ways' and then replaced it with 'The Principle of Recombination':

> (ii) Ways: Every way that a world could be is a way that some world is; and every way that a part of a world could be is a way that some part of some world is.[76]

> (iii) The Principle of Recombination: Anything can coexist or fail to coexist with anything else, provided they occupy distinct spatiotemporal positions.[77]

III

Analysis. Having postulated an abundance of worlds which are all the ways a world could be, a materialist reduction of modality becomes possible: modal discourse can now be reduced to talk about these worlds and their parts. Lewis's analysis states an equivalence, which is ordinarily read as laying down a *truth-condition* for modal claims. It doesn't say *how* we are to determine for any given modal claim, what its truth-condition is. It just says *that* modal claims of certain forms have corresponding truth-conditions of a certain form. Though the analysis below is divided into the analysis of the *de dicto* and the *de re*, it treats both kinds of modal claim as fundamentally the same, in that they quantify over the same subject-matter: worlds and their parts.

When we assert that it is necessary or possible that a general proposition *p* is true, we make a *de dicto* modal claim. Lewis analyses the *de dicto* as follows:

> (a) Possibly *p* iff there is a world *w*, such that at *w*, *p*.
> (b) Necessarily *p* iff every world *w* is such that at *w*, *p*.[78]

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[75] Ibid., 86-87.
[76] Ibid., 2, 86.
[77] Ibid., 88.
[78] See ibid., 5-7.

An example: suppose we assert that there could be a blue moon. According to the analysis, we thereby assert that there is a world where there is a blue moon. One way to express this is as follows:

$$\exists x \exists y (Wx \ \& \ Pyx \ \& \ My \ \& \ By)$$

which says that there is an x and y such that x is a world which y is part of, y is a moon and y is blue.

When we say of a particular thing that *it* possibly or necessarily has a certain property, we make a *de re* modal claim. The analysis of the *de re* runs as follows:

(c) x is possibly G iff there is a counterpart of x which is G.

(d) x is necessarily G iff every counterpart of x is G.[79]

Another example: suppose we assert that Moses could have played football. According to the analysis, what we assert is that there is a counterpart of Moses who plays football. One way to express this is as follows:

$$\exists x \exists y (Wx \ \& \ Pyx \ \& \ Cym \ \& \ Fy)$$

which says that there is an x and y such that x is a world which y is part of, y is a counterpart of Moses, and y plays football.

Note that both the *de dicto* and *de re* analyses are meant to analyse a single basic concept of modality, which is understood in terms of quantification over worlds and their parts. As such, the basic concept of modality in terms of which all others can be defined is, for Lewis, non-epistemic; it belongs to ontology, not epistemology. Other modal notions can be understood by restricting the domain of quantification.[80] So, for instance, p is *physically* necessary just if for every world w which has the same physical laws as the actual world w^*, at w, p.

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[79] Ibid., 8.
[80] Ibid., 7.

2.1 Relating Lewis's ontology of worlds and the analysis of modality

I

Clarification of what worlds are. Worlds, for Lewis, are universes like the one we live in. ("The other worlds are of a kind with *this* world of ours."[81]) But it is not exactly right to say that *whatever* our universe is, Lewis thinks of worlds as more things of the same kind. Lewis takes our universe to be a physical entity and other worlds are other such entities.[82] Officially, Lewis takes words to be maximal spatio-temporally interrelated fusions. How are such fusions to be understood? A mereological fusion of several things is that thing y such that for any x, x overlaps y iff x overlaps one of those things.[83] What distinguishes the fusions which *are* worlds from those that are not? Fusions f which are worlds must meet the following conditions:

Totality: every part of f is spatio-temporally related to every other part of f

Maximality: anything spatio-temporally related to any part of f is a part of f.[84]

Assume that my – Jonathan Nassim's – body can be defined as a fusion of spatio-temporal parts. Is my body a world? Totality doesn't rule it out from being a world. Totality ensures that for any part of a world, there is a spatio-temporal path connecting it with any other part. My body clearly satisfies this condition: my thigh bone is (spatio-temporally) connected to my hip bone etc. My body fails however to satisfy Maximality. For *your* body is spatio-temporally related to *my* body, but it is not a part of mine. My body is a spatio-temporally interrelated fusion, but it is not maximal. Maximality is thought to pick out the subclass of fusions satisfying Totality which are worlds.

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[81] Lewis 1986, 2, my italics. Also see Lewis 1973, 85.
[82] Lewis 1986, 2, 69, 73. Lewis takes his two notions of world – the former *indexical*, the later *physical* – to coincide. It is the later notion which officially occurs in his theory. In practice, Lewis weakens the physical definition of 'world'. Maximal fusions whose parts are related by external relations which are spatio-temporal or *analogous* to spatio-temporal relations, are both counted as worlds (ibid., 75, 76 esp. fn. 55, 230). This generates a tension with the indexical notion of world. For if we understand the notion of a world via the kind of thing which surrounds us, then it is questionable whether non-physical worlds really are worlds if they are very dissimilar that the thing which surrounds us.
[83] Lewis 1986, 69 fn.51, 70.
[84] For this formulation see Sider 2003, 192-93.

II

This conception of the nature of worlds interacts in various ways with Lewis's analysis of modality. I note two of them. First, it follows from Lewis's definition of worlds, that they are spatio-temporally *isolated*. For if one world stood in spatio-temporal relations with another, the two worlds would, by Maximality, be parts of the same world, and so not distinct.[85] Isolation motivates the development of counterpart theory, and its use in giving an analysis of *de re* modality.[86] The reason for this is that if worlds are isolated, then they have no parts in common. This means that possibilities for an individual *i* in some world *w* cannot be understood in terms of how things go for *i* itself in other worlds – for *i* doesn't exist in worlds other than *w*. I elaborate on this aspect of the relationship between the ontology of worlds and the analysis of *de re* modality in the discussion of counterparts below.

Second, though no object can be wholly in two worlds, Lewis takes there to be objects composed of parts of different worlds, called 'trans-world individuals'. The existence of trans-world individuals follows from three of Lewis's views: (a) that there exist a plurality of worlds, (b) the definition of worlds as fusions of individuals, and (c) the principle of unrestricted mereological composition, which says that for any things whatsoever, there is some thing which is composed of them.[87] Together, a consequence rather awkward for Lewis's analysis of modality appears to follow. According to Lewis's analysis it appears that it is possible for *x* to exist iff there is a world where *x* exists iff there is a world which *x* is part of.[88] Given that in general, if *x* is part of *y*, then the *whole* of *x* is part of *y*, it follows that if it is possible for *x* to exist, then the whole of *x* must be part of a world.[89] Trans-world individuals however only *partly* exist in any world, that is, only some proper parts of them exist in any world. If the whole of a trans-world individual exists at no world, such entities are, according to the analysis, impossible beings. Indeed Lewis acknowledges this:

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[85] A world *a* can contain a *duplicate* of another world *b* as a part, but this doesn't violate the isolation of worlds, for a duplicate of *b* is not itself *b*. For 'duplicate' see Lewis 1986, 89.
[86] By 'counterpart theory' I mean Lewis's counterpart theory, unless I state otherwise.
[87] Ibid., 211.
[88] Ibid.
[89] Lewis writes: "There are no free-floating *possibilia*. Every possibility is part of a world – exactly one world…" (Ibid., 23).

Parts of worlds are *possible* individuals; trans-world individuals are...*impossible* individuals.[90]

A serious problem for this view is that it doesn't conform to some important modal intuitions. First, it is correct to infer from the impossibility of x to the non-existence of x[91], and second it is correct to infer from the existence of x to the possibility of x. Yet the view proposed allows that some x exists and is impossible, thereby violating both inference rules.[92]

III

Clarification of what counterparts are and their use in the analysis of de re *modality*. Take an individual i which exists at a world w. Its counterpart, in a world w', is the most similar object to i in w'. In w, i itself is its own counterpart. The totality of counterparts of i is the set of objects, drawn one from each world, which are the most similar objects to i, in their respective worlds. The similarity relation that figures in the definition of counterpart is called 'the counterpart relation'. The counterpart relation pairs up i and its counterparts in other worlds, by examination of their intrinsic and extrinsic qualitative properties. Lewis writes:

> Your counterparts resemble you closely in content and context in important respects. They resemble you more closely than do the other things in their worlds.[93]

Answers to questions about similarity are sensitive to which respects of similarity are in question and how those respects are weighted. Is this blue ball more similar to

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[90] Ibid., 211. Lewis, in an earlier work, admitted that "the possible individuals are not all the individuals", and that "a cross-world sum is not a possible individual. There is no way for the whole of it to be actual. No matter which world is actual, at most a proper part of it actually exists. It is not in any world...for it is not part of any world. But it is partly in each of many worlds, overlapping different worlds in virtue of different ones of its parts" (1983, 39-40). So on this view there are objects not in logical space –it, as it were, has an *outside*.

[91] Lewis makes this inference, at least when source of the impossibility of x is that the given description of it is contradictory. See Lewis 1986, 7 fn.3 and 1983, 21.

[92] Lewis has a response to this charge. He writes: "to call the trans-world individuals 'impossible'...is *only* a terminological stipulation" (Lewis 1986, 211, my italics). And he offers another terminological stipulation on which trans-world individuals turn out not to be impossible. It seems that given the importance of this issue to the coherence of Lewis's analysis, these 'merely' terminological issues must be ironed out in a way that trans-world individuals, the analysis of modality and our modal inferences can live together.

[93] Lewis 1983, 28. See also his 1986, 88.

that green ball or to the blue sky above them both? This depends on which respects of similarity we focus on: if it is simply type of colour, then the ball and the sky are more similar, if it is simply type of shape then the two balls are more similar. If we focus on several respects of similarity – colour and shape, say – then the answer will depends in part on how these respects of similarity are weighted. Lewis thinks this is as it should be, because the counterpart relation is

> problematic in the way all relations of similarity are: it is the resultant of similarities and dissimilarities in a multitude of respects, weighted by the importances of the various respects and by the degrees of the similarities.[94]

Counterpart theory and the semantics that flows from it require that worlds and things in them stand in determinate similarity relations. When we utter a *de re* modal sentence – say, '*x* could have *F*-ed'[95] – we implicitly select a counterpart relation which determines the relevant class of counterparts, and so provides our sentence with a truth-condition: *x* could have *F*-ed so long as one of its counterparts *F*s.

Why use counterpart theory to analyse *de re* modality? Possibilities are, on Lewis's view, worlds.[96] He thinks that when we ask whether 'Possibly *p*' is true, we wonder whether there is a possibility, that is, a world, where *p*.[97] When we ask whether '*x* is possibly *F'* is true, the natural way of extending the analysis is that we are asking of *x* whether *it* is, in some world, *F*. The effect of 'possibly' in either case would appear to get us to a world.

However, on Lewis's mereological conception of worlds, this analysis would destroy contingency. For any object which is *wholly* part of a world, is wholly part of *just one* world. Suppose an object *a* exists in the actual world. Further suppose that '*a* is *F*' is always false at the actual world. It follows, according to the natural extension of the analysis above, that '*a* is possibly *F*' is necessarily false. For the only way for *a* to be possibly *F* is for *a* to be F at some world and for *a* to be *F* at some world *a*

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[94] Lewis 1983., 28.
[95] Where appropriate, quotation should be understood as quasi-quotation.
[96] Lewis writes: "It is usual to think that the unit of possibility is the possible world...It is true, and important, that possibilities are invariably provided by whole possible worlds" (Lewis 1986, 230).
[97] Where appropriate, single quotes are to be read as corner quotes.

must be *in* some world in which it is *F*. But in the actual world, the only world in which *a* exists, *a* is *not F*. So there are no worlds in which *a* is *F*. So '*a* is possibly *F*' is necessarily false. Were Lewis's analysis of modality to be extended in this way, no individual would have any property contingently.

Counterpart theory is designed to analyse *de re* modality without giving up on contingency. Rather than treat '*x* is possibly *F*' as stating that *x itself* is *F* at a world, counterpart-theoretic semantics takes its truth-conditions to be that a *counterpart* of *x* is *F* at a world. So while *x* itself remains (by definition) moored to the world of which it is a part, its modal properties are analysed in terms of the non-modal properties which the objects most *like* it possess at other worlds. By altering the analysis of modality *de re*, Lewis attempts to construct a semantics which accommodates contingency – or at least, simulates it – in a context in which the natural extension of his analysis would destroy it. Thus, though Lewis analyses the *de dicto* and *de re* in terms of the same subject-matter – worlds and their parts – they are distinct analyses, with distinct motivations.

IV

The relation between Lewis's ontology and the language in which the analysis of modality is couched. We may ask which comes (conceptually) first: Lewis's use of a first-order language to analyse modality or his ontology of worlds whose natural description is in a first-order language. Williamson seems to take the first view:

> Although Lewis's attitude to modality is sometimes viewed as the opposite of Quine's, he is more accurately understood as reducing modal language to Quineanly acceptable language…[98]

Lewis's project, as Williamson sees it, is primarily one about language and the ontology of worlds provides the means to carry out this project. Agustín Rayo, contrasting Lewis's project with his own "*linguistic* project of assigning truth-conditions to modal sentences", sees Lewis as

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[98] Williamson 2013, xiii. For a similar point see also Williamson quoted in Antonsen 2010, 25.

primarily engaged in the *metaphysical* project of characterizing a space of Lewisian worlds…[99]

Whichever way is correct, it is clear that if an ontology of worlds is to be described by a first-order language, the two must fit each other. If the objects which constitute the ontology are to be reached by names or variables of the language, they must meet certain conditions. What those conditions are is a matter of some debate, but it seems fairly clear that *we* must possess a criterion of identity for these objects – and this means the *objects* must be a certain way, for instance, they must be such that there is a determinate answer as to when any two of them are identical or not.[100] The language in which a theory of possibility is couched imposes important constraints on the kinds of entities it can take possibilities to be. Lewis demands that possibilities are entities which we can quantify over, and this has important ramifications for his theory (see §§4.23-4.26).

V

Does the analysis follow from the ontology? I just noted two possible starting points for Lewis's theory – language or ontology. I now ask whether there is evidence for thinking Lewis puts his ontology first, and whether his analysis is, in a sense, 'contained' in it. I have assumed in the way I separated out the two parts of Lewis's theory, and discussed their relation, that the ontology and analysis are logically independent aspects of it. However there are reasons to challenge this widely held assumption. Despite dividing his own theory into an ontological part and an analytical part, there is some textual evidence that Lewis thinks that the analysis *follows from* the ontology; and some of his commentators appear to support this.[101] I

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[99] Rayo 2013, 156, my italics. He goes on, on the same page, to recognise that "the two projects [metaphysical and linguistic] are interrelated, of course, since a space of Lewisian worlds can be used, in the presence of a suitable counterpart relation, to assign truth-conditions to modal sentences, and an assignment of truth-conditions to modal sentences imposes significant constraints on the space of Lewisian worlds."

[100] Other than possessing a criterion of identity it might be thought that objects that can be named or quantified over must possess determinate identity conditions, or must fall under a sortal concept, or be possible members of sets. For some discussion of some of these requirements see Lowe 1995.

[101] One reason it is important for me to clarify which the correct interpretation is, is because I assume in the content and structure of this thesis that the two parts of Lewis's theory are independent and can be treated separately.

now defend the view that though there are ways in which they are related, they are nonetheless logically independent.

We can distinguish two views about the relation of Lewis's ontology and his analysis:

> Dependence: Lewis's ontology and analysis are logically dependent. There are two ways they can be dependent: the analysis depends on the ontology or vice versa.

> Independence: it is not the case that Lewis's ontology and the analysis are logically dependent.

One apparent endorsement of Independence as the correct interpretation of Lewis comes from Stalnaker:

> The thesis of modal realism has two parts. First, the ontological claim that there are other worlds spatially and temporally disconnected from ours; second, the semantic claim that statements about what might or must be true are to be analysed as quantifications over these worlds.[102]

By saying that Lewis's ontology and analysis are distinct parts of his theory, Stalnaker may be understood as saying that they are logically distinct parts. The point is made more explicitly by Charles Chihara:

> ….there is no logical connection between Lewis's ontology of worlds and his analysis of modal operators, in virtue of which belief in the former commits one to acceptance of the latter.[103]

Despite being the standard view, there are two curious facts about Independence. First, Lewis never *explicitly* endorses it. Second, there is some textual evidence that

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[102] Stalnaker 1988, 118. Note that Stalnaker means by 'modal realism' here what I mean by 'Lewis's theory of modality', comprising his ontology of worlds, and his analysis of modality.
[103] Chihara 1998, 83.

he rejects it, and takes the analysis to be 'contained' in his ontology. What is the evidence that Lewis supports Dependence?

First, he stresses the entanglement of his analysis with the ontology of worlds. In advocating Modal Realism Lewis suggests that systematic philosophy goes more easily when we "*presuppose* modal realism in our analyses".[104] If presupposition of an ontological thesis by a conceptual thesis means that the latter entails the former, then presupposition may be thought to bring logical dependence.

Second, and more importantly, Lewis seems to think that if there are all the worlds he holds there to be, it follows that the correct analysis of modal concepts is in terms of quantification over worlds. Introducing his analysis for the first time in *OPW,* he writes:

> What actually is the case, as we say, is what goes on here. That is one possible way for a world to be. Other worlds are other, that is unactualised, possibilities. 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. Conversely, since it is safe to say that no world is any way that a world could not possibly be, whenever there is some world at which such-and-such is the case, then it might be that such-and-such is the case. So modality turns into quantification: possibly there are blue swans iff, for some world W, at W there are blue swans.[105]

Call this passage 'Lewis's Argument'. According to it, if Modal Realism is true, then possibly *p* iff there is a world at which *p,* where the bi-conditional is to be understood as expressing a conceptual analysis of modality. If the analysis were a *purely* conceptual thesis, then it would be hard to understand how it could *follow* from what appears to be a *purely* ontological thesis. For an ontological thesis asserts that so-and-so exists, from which nothing about the correct analysis of concepts appears to follow. One way of explaining how the conclusion of Lewis's Argument

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[104] Lewis 1986, vii, my italics. Also he counts his analysis of modality as an instance of Modal Realism "at work" (ibid., 5).
[105] Ibid.

is reached is by denying that the ontological thesis is *purely* ontological, and so to treat the ontological thesis as being a partly conceptual thesis. Another explanation is to deny that the conceptual thesis is *purely* conceptual, and so to treat the conceptual thesis as being a partly ontological thesis. A different approach altogether is to deny that the conclusion of Lewis's Argument follows at all, and explain this fact by denying the existence of a logical connection between the ontological and conceptual theses.[106]

Jessica Wilson appears to hold the second view: that Modal Realism is not a purely ontological thesis. She writes that Modal Realism, specifically, the principle of plenitude, does

> little more than encode, for worlds or parts of worlds, the operative assumption that modal claims involve quantification over possible worlds (such that, e.g., *p*'s being possible is understood in terms of *p*'s being true in some possible world)….[and that it]…provides a translation strategy for modal claims…[107]

On Wilson's Dependence view, Lewis's ontology "encodes" his analysis. This seems to be consistent with the interpretation of Lewis's Argument above, according to which his analysis follows from his ontology. Wilson focuses on Lewis's principle of plenitude, and seems to think this part of his ontology "provides a translation strategy for modal claims". However, it doesn't appear at face value that *any* part of Lewis's ontology could do such a thing. It is true that Lewis's ontology postulates objects which can be *utilised* by an analysis, but this doesn't put the ontology itself in logical relations with the analysis.

On my view, Lewis embraces Independence, despite some appearances to the contrary. To support this, compare Lewis's Argument with the following point he makes when discussing supervenience:

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[106] I set aside a further possibility which is denying that Lewis's analysis is a conceptual analysis. See §4.1 for evidence to support the view that it is.
[107] Wilson, forthcoming.

A supervenience thesis is a denial of independent variation. Given an ontology of *possibilia*, we *can* formulate such theses in terms of differences between possible individuals or worlds. To say that so-and-so supervenes on such-and-such is to say that there can be no difference in respect of so-and-so without difference in respect of such-and-such.[108]

The point here is that the ontology of *possibilia* makes possible – *not logically obligatory* – an analysis of supervenience in terms of it. This is the same strategy Lewis applies again and again in his career: find a problematic concept in philosophy, and put *possibilia* to work in defining it. But that doesn't mean the ontology *forces* any analysis upon us. Defining a concept in terms of worlds is a *decision* we may choose to make. Belief in the "vast realm of *possibilia*" gives you an ontology which those choices can exploit, and we are free in our theories to do so.[109] Whether we should make such decisions is, for Lewis, a matter of balancing the costs and benefits to our theory of doing so (see §2.2 and Chapter 5). This helps us see that in Lewis's Argument, he is using rhetorical flourish when he says "*so modality turns into quantification*". This is not a conclusion of an argument. He should be read as saying that, given an ontology of worlds, we *can* – not *must* – analyse modality in terms of them.

Having given a reason to think that Lewis isn't committed to Dependence, I now give an intuitive reason to think that Independence is correct. Consider the following two hypothetical scenarios, neither of which appear to lead to contradiction:

(i) Suppose our modal concepts are analysed in terms of quantification over worlds, but there are no worlds other than our own.

(ii) Suppose a plenitude of worlds exist in all their glory, but our modal concepts cannot be analysed in terms of them. Perhaps our modal concepts turn out to quantify over another kind of thing, or perhaps they are not concepts drawn from ontology at all.

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[108] Lewis 1986, 29, my italics.
[109] Ibid., 4.

Logic doesn't seem to preclude either view. In the first case our modal concepts speak of other worlds other than our own but there are none, and so our modal beliefs are in error; in the second case worlds other than our own exist, but our modal concepts do not speak of them. Neither situation appears contradictory so both situations appear logically possible, so Dependence appears false.[110]

2.2 Justification

I

Plato had his Forms and Lewis his worlds; worlds are, for Lewis, the key to philosophical insight. He believed that philosophically problematic notions – such as content, proposition, property etc. – had been fruitfully defined in modal terms, in particular, in terms of possible worlds.[111] But for a reduction of this circle of intensional concepts to be carried through, modality must itself be reduced, in particular the notion of possible world. Otherwise, modality will have been implicated in the definition of central philosophical concepts, but without a reductive definition of it being available; one intensional notion will have been used to define the others.

For Lewis, the fact that his theory of modality is reductive provide a *justification* for it.[112] In order to understand why he takes this view a little must be said about the theoretical setting of his theory.

II

First, Lewis's philosophical starting point is a Neurathian conception of the given. This is the epistemological view according to which (a) we find ourselves with a range of beliefs about the world, and (b) there is no way to distinguish a special class of them (e.g., by intuition or experience) which are guaranteed to be epistemically

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[110] For a further reason for Independence being a requirement of Lewis's theory, see §3.2.
[111] Lewis 1986, 3.
[112] Ibid., 4.

secure. All of our beliefs are – in the sense of failing to have foundations – on an epistemic par.[113]

III

Second, given a Neurathian starting point, philosophy cannot be the search for foundations. Instead, Lewis suggests, philosophy should aim at *harmonising* belief. Or as Quine had it, philosophy is concerned with "rounding out our system of the world" in pursuit of truth.[114] The idea is to start with the beliefs we have – for on this view, we have nowhere else to start – and to bring as many beliefs as possible into 'reflective equilibrium', in a unified theory of reality. As Lewis put it,

> [o]ne comes to philosophy already endowed with a stock of opinions. It is not the business of philosophy either to undermine or to justify these preexisting opinions, to any great extent, but only to try to discover ways of *expanding them into an orderly system*.[115]

Unlike Quine, who wanted to bring clarity and order to our scientifically respectable beliefs, Lewis aims at a theory which brings *all* our beliefs into reflective equilibrium, scientific and unscientific alike.[116] This is why modal beliefs get a hearing in Lewis; it is not due to his view that they are central to science, it is enough that we simply *have* them.

IV

Third, how does philosophy contribute towards bringing our beliefs into reflective equilibrium? A central way it can do so, for Lewis, is to make our theory of the world increasingly *unified*. Lewis writes:

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[113] This is of course not to say that there are no reasons for thinking some of our beliefs are on a more or less sound epistemic footing than others. It's just that there is no way to establish that any are on an absolutely sound footing.
[114] Quine in Magee 1978. See also Lewis 1986, 4.
[115] Lewis 1973, 88, my italics.
[116] Loux and Zimmerman 2003, 1-7.

> improv[ing] the unity and economy of the theory…is our professional concern – total theory, the whole of what we take to be true.[117]

Lewis aims to implement the project of unifying our theory by reducing the number of concepts we have to accept as primitive.[118] This essentially involves the use of conceptual analysis. In the case of modality, Lewis takes this to involve postulating a range of worlds and reductively analysing modal notions as quantification over them. Lewis takes this approach to be "the only successful attempt I know of, to systematize…preexisting modal opinion".[119] He appears to fuse a traditional view of philosophy as the *a priori* search for conceptual analyses, with the view that these analyses should further the pursuit of bringing our beliefs together in the most unified theory available. The analyses aid the theory by showing how notions once accepted as primitive, can in fact be defined in more basic terms.

V

Fourth, conservatism. The change, in the form of unification, that Lewis wants philosophy to bring to our theory of the world must, he thinks, be balanced against preserving as much of our body of belief as possible. But conservatism isn't merely a voluntary brake on unification, it a requirement on recognising this theory as true.

Lewis's takes a principle of charity to apply to the beliefs given in the original Neurathian position: they are by and large *true.*[120] For Lewis, making our beliefs more unified is only epistemically worthwhile if they are already taken to be true; only then does the simplicity that unity brings to theory make it more likely true.[121] If truth comes from below (our initial beliefs) and above (our unification of them), then the philosophical balancing act is to unify, while not undermining, these initial beliefs. This explains why Lewis treats lack of fit of prior beliefs as a cost; for the truth of a theory is largely inherited from the initial beliefs it systematises. Lewis writes about this in the following passage:

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[117] Lewis 1986, 4.
[118] Ibid.
[119] Lewis 1973, 88.
[120] Ibid., 134.
[121] Ibid., 4.

it is pointless to build a theory, however nicely systematised it might be, that it would be unreasonable to believe. And a theory cannot earn credence just by its unity and economy. What credence it cannot earn, it must inherit. It is far beyond our power to weave a brand new fabric of adequate theory *ex nihilo*, so we must perforce conserve the one we've got. A worthwhile theory must be credible, and a credible theory must be conservative. It cannot gain, and it cannot deserve, credence if it disagrees with too much of what we thought before. And much of what we thought before was just common sense. Common sense is a settled body of theory – unsystematic folk theory – which at any rate we *do* believe; and I presume that we are reasonable to believe it. (*Most* of it.)[122]

It is natural, on this view, to want the systematisations of our beliefs that philosophy proposes to preserve the content and truth of our beliefs. Lewis holds that because revision of belief is a cost to a theory, they must be *revised* as little as possible.[123] This conservatism is captured by Quine and Joseph Ullian:

> the less rejection of prior beliefs required, the more plausible the hypothesis – other things being equal.[124]

It is in unifying our beliefs which are taken by default to be by and large true that an improvement to those beliefs is thought to emerge. On this view, a unified theory however beautiful it may has no claim to truth without incorporating beliefs we already take to be true. A central assumption guiding the view that systematisations of belief should be unifying but conservative is that the costs and benefits to a theory of conservation of prior beliefs and of unification are comparable and can be determined (they can be 'traded-off' against one another to find an acceptable equilibrium). I question this assumption in §5.4.

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[122] Ibid., 134.
[123] Where revision may amount to treating a proposition we believe to be true, as false or undecided, or treating a proposition we believe false as true or undecided, or treating an undecided proposition as true or false.
[124] Quine and Ullian 1970, 67.

VI

Fifth, tension. The twin demands to unity belief and conserve belief are in tension. Lewis takes the task of philosophy to be finding a theory in an *acceptable* state of tension.[125] He self-consciously describes this productive tension as follows:

> In trying to improve the unity and economy of our total theory by providing resources that will afford analyses, for instance of modality as quantification over worlds, I am trying to accomplish two things that somewhat conflict. I am trying to *improve* that theory, that is to change it. But I am trying to improve *that* theory, that is to leave it recognisably the same theory we had before.[126]

The tension starkly emerges in Lewis's understanding of the role of conceptual analysis:

> The object of analysis is to reduce our burden of primitive notions, and to make tacit understanding explicit – not to bootstrap ourselves into understanding what we didn't understand at all beforehand.[127]

How can conceptual analysis serve the goal of improving our beliefs – by reducing "the burden of primitive notions" – and at the same time, capture their content? An analysis which *revises* belief, surely cannot at the same time *record* it. I think Lewis's response would be to say that we have a folk-theory of, say, modality – but we are unaware of what it is. His aim is to make that folk-theory explicit, and so to show want the content of modal belief as supplied by that theory. It turns out, on this response, that the content of our modal beliefs are different from what we thought they were. According to this response, this isn't a *revision* of modal beliefs; it is a

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[125] See Lewis 1986, 134 and his 1983, x.

[126] Lewis 1986, 134.

[127] Ibid.,154, see also 20 and 189. Compare with two of Lewis's points about the role of analysis in the philosophy of mind, which are applications of "making tacit understanding explicit". First, "[m]ental features of the world…are not at all beyond our ken. Finite assemblies of particles – us – can track them. Therefore there must some sort of simplicity to them. Maybe it will be a subtle sort of simplicity, visible only if you look in just the right way. (Think of the Mandelbrot set: its overwhelming complexity, its short and simple recipe.) But somehow it must be there. Revealing this simplicity is a job for conceptual analysis." (1999, 297-98). Second, "conceptual analysis can reveal the simple formula — or anyway, the much less than infinitely complicated formula — whereby, when we know enough, we can pick out a mental feature of the world from all the countless other features of the world that likewise supervene on fundamental physics (ibid., 303).

discovery of what they're really about; what is revised is our *understanding* of their content. Our theory of the world can be said to be improved because modal beliefs are shown not to required modal primitives, and so a simplification of our understanding of modality is achieved. The following passage is a good example of this strategy:

> The standards of validity for modal reasoning have long been unclear; they become clear only when we provide a semantic analysis of modal logic by reference to possible worlds and to possible things therein. Thus insofar as we understand modal reasoning at all, we understand it as disguised reasoning about possible beings. But if these are intelligible enough to provide modal logic with foundations, they are intelligible enough to be talked about explicitly. Modal reasoning can be replaced by nonmodal, ordinary reasoning about possible things.[128]

The call for 'replacement' here is only the call for the replacement of the implicit with the explicit; not the elimination of one discourse, and its replacement by another. Of course it might be held that Lewis's response is unsatisfactory. That in fact he *is* replacing one discourse by another. Sure, it might be thought, he respects the preservation of the *truth-value* of modal sentences, but he doesn't preserve their *content.* On this view, Lewis's is a weak or pretend form of conservatism. A strong or genuine kind preserves the truth *and* the content of belief. According to this line of thought, we are aware of what the content of modal claims are, and the surprise we all have on hearing Lewis's analysis for the first time, shows that if we have a 'Folk Theory' which gives our modal claims their meaning, we are not entirely unaware of it. We might put the point by saying that in the Neurathian situation, we are aware of *what* it is we believe. The ignorance about content Lewis requires for his re-interpretation of modal belief to work is implausible.

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[128] Lewis 1983, 10.

VII

Sixth, this finally brings us to the *justification* of Lewis's theory. For a theory to be credible it must, for Lewis, be (a) conservative and (b) unified. Lewis takes his theory of modality to both be conservative with respect to our modal beliefs and more unified than any other theory of modality. This is primarily because he takes it to reduce modal notions. It is this feature of his theory that he takes to distinguish it from all others, and provide a central reason to belief it to be true. In Chapter 5 I develop this line of thinking, and argue that Lewis's justification for his theory is unsatisfactory.

Chapter 3: Ontology

3.0 Introduction

Lewis's theory is standardly rejected due to concerns about his ontology of worlds. Sider, for instance, is typical in thinking that "it is very difficult to believe that they exist", and that they are just "too much to take".[129] Reasons for this rejection, when they are rarely given, range from concerns of ontological profligacy, to the inconsistency of the pluriverse with the verdicts of physics.[130] I don't believe that the central problems with Lewis's theory are purely ontological, but rather lie in the interaction between his ontology and his analysis of modality. In this chapter I focus on this interaction by asking what Lewis must say about his worlds for them to fit with our modal beliefs (and so meet the material adequacy condition) and reduce modality (and so meet the reduction condition, see §1.2 for the conditions).

I will argue for two main points. First, the two conditions seem unable to be jointly satisfied in Lewis's theory. This is because without irreducible modal notions in Lewis's ontology, there appears no way for it to postulate an abundance of worlds. Given that Lewis understands our modal beliefs in terms of quantification over worlds, there don't seem to be enough worlds to account for the truth of those beliefs. For Modal Realism to work, Lewis must embrace irreducible modality.

Second, Lewis's theory decides on a number of modal claims which we are pre-theoretically undecided about or else outright opposed to – it would be better if his theory correctly captured our attitude towards such claims or else were neutral with respect to them. I provide several examples of such claims, and argue that Lewis's revisionary stance with respect to them makes it questionable that his theory is materially adequate. I suggest that one reason for this revisionary stance is that Lewis builds into his ontology a combinatorial conception of possibility from which a substantive Humean view about what is or is not possible flows.

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[129] Sider 2008, 1. For a similar point, see Hughes 2004, 137.
[130] Williamson 2013, xiii.

These conclusions mean that a common interpretation of Lewis's theory of modality as reductive, materially adequate but unbelievable due to its ontological extravagance appears incorrect. Furthermore, it appears to mislocate what the fundamental problem with the ontology of worlds is as a problem of *ontology*, rather than as a problem of *using* this ontology to reductively analyse modality. I proceed in this chapter by asking if Lewis's ontology can play the roles it is designed for, specifically, whether his principles of plenitude – the principles used to postulate an abundance of worlds – are fit for purpose. I begin by asking what such a principle is and why Lewis needs one (§3.1). In the rest of the chapter (§§3.2-3.5) I outline his two candidate principles of plenitude, and argue the neither are fit for purpose.[131]

Before beginning, I want to note an objection to this approach to reduction. It might be thought that while it is not obvious whether Lewis's theory postulates enough worlds, it is nonetheless easy to determine whether it is reductive: simply *look* at his analysis of modality and ask if it contains any irreducibly modal terms; given that it doesn't, it isn't reductive. The trouble with this approach is twofold. First, as with any other analysis, the target concept might occur *covertly* and *unobviously* in its analysans. Determining whether it occurs covertly takes work – and cannot be done simply by examining the words used in the statement of the analysis. But second, and more importantly for our purposes, the problem with the approach is that it fails to respect the fact that Lewis's theory of modality divides into two, and that *both* its ontology *and* its analysis must conform to the reduction condition. Any modal notions occurring in the ontology must be reducible in the analysis, and the analysis itself may not contain any irreducible modal notion. Exclusive focus on Lewis's *analysis* will not bring out his use of irreducible modal notions in his ontology.

3.1 Why Lewis needs a principle of plenitude

I

For it to be plausible that Lewis's theory is materially adequate, it is not enough that there merely *is* an abundance of worlds – as there may well be – the theory must *say*

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[131] I agree with Lewis who himself accepts his first principle *isn't* fit for purpose, I disagree with his verdict that his second attempt is.

that there is, and I will argue that it appears unable to do so without resort to irreducible modality. It is worth nothing the obvious: that while the postulation of an abundance of worlds may help make Lewis's theory materially adequate, it is merely a postulation. It doesn't, of course, answer the questions of whether we should believe (a) that there are all these worlds and (b) that they can be used to correctly (and/or reductively) analyse our concept of modality.

A principle of plenitude is an ontological principle which expresses the thought that there exists a *plenitude* or *abundance* of objects of some kind or kinds. Any analysis of a notion in quantificational terms presupposes the existence of the range of objects quantified over.[132] When the analysis quantifies over a very large number of things, we can say, vaguely, that the analysis presupposes an *abundance* of objects. Take, for instance, the reduction of the mental to the neurophysiological. It presupposes both that *quite a lot* of brain matter exists, and that an *abundance* of neurological connections exist therein. When it comes to modality, because we take there to be an infinite number of distinct possibilities, if modality is to be analysed as quantification over worlds, then the analysis presupposes the existence of an infinite number of worlds.[133]

But while the *motivation* for a principle of plenitude often lies in an analytic or theoretical demand, it ought not to be *defined* in terms of that demand; a principle of plenitude should be specifiable *independently* of these analytic demands. Were principles of plenitude for objects of kind *F* of the form 'There are *F*s enough to provide a quantificational analysis of so-and-so claims', its truth would fail to be part of an explanation of why those so-and-so claims are true.[134]

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[132] Strictly speaking, the presupposition is not made by the analysis – which can be thought of as expressed by a bi-conditional of some sort – but by the analysis together with the truth of a proposition which it analyses.

[133] I take an abundance of worlds not merely to require a large number of worlds. For consider a world with one grain of sand in it, and nothing else. There is a *numerical* abundance of worlds if for each additional grain of sand, there is a world in which there is just that number of grains of sand and nothing else (at least presuming an infinite number of worlds is a numerical abundance of worlds). This is however not the right kind of abundance for Lewis's purposes, for he ties the possibility of *F* to a world in which *F* exists. And worlds with grains of sand and nothing else don't even cover all the possibilities involving sand – for instance, the possibility of a shore, which requires sand and sea. What Lewis needs is a *qualitative* abundance of worlds.

[134] Lewis doesn't always make clear the distinction between the semantic and explanatory purposes he has for worlds. Stalnaker does: "Modal realism is really two theses, one semantic and one metaphysical. The semantic thesis is that claims about what is possible or necessary should be analysed as claims about what is true in some or all of the appropriately individuated parts of reality. The metaphysical thesis is that there exists a plurality of parts of reality individuated in this way—a plurality that is full enough to make true many of our ordinary beliefs about what is possible and necessary when those beliefs are interpreted in accordance with the semantic thesis" (2003, 40).

II

Lewis's quantificational analysis of modality treats modal claims as quantifications over worlds. For such an analysis to be materially adequate, it must be shown that the truth of our modal beliefs is sustained by worlds. So in order for there to be enough worlds to sustain our beliefs, an abundance of worlds needs to be postulated (noting what I said above: that 'an abundance of' does not simply *mean* 'enough for some purpose'). Lewis indicates what is required:

> We have only to *believe in the vast realm of possibilia*, and there we find what we need to advance our endeavours. We find the wherewithal to reduce the diversity of notions we must accept as primitive…[135]

The principle of plenitude Lewis needs is one which roughly specifies the class of *possibilia,* and so makes explicit what ontological commitments his theory of modality incurs. His hope is that the worlds it postulates make possible a reductive analysis of our modal notions, and an explanation of the truth of our modal beliefs.

Lewis wants – and it is required for the material adequacy of his theory – a principle of plenitude to postulate a space of worlds which matches up with our intuitive conception of logical space. Given his view that, upon analysis, we see that modal beliefs are really beliefs about worlds, there are two ways a principle of plenitude can fail to match up with our beliefs. First by postulating worlds which are impossible by our lights, second, by not postulating worlds required for the truth of our modal beliefs.

To address the first point, Lewis is not concerned that his principle of plenitude will generate impossible worlds. This is because he thinks the notion of an impossible world is contradictory and so describes nothing. Lewis's reasoning is as follows: an impossible world is a world at which a contradiction holds; to describe such a world is equivalent to asserting a contradiction; and contradictions are necessarily false,

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[135] Lewis 1986, 4, my italics. We can think of this as Lewis's general answer to a question posed by Stalnaker: "what kind of metaphysical commitments do we need to make in order to have access to the philosophical clarifications provided by analyses of various modal and intentional concepts in terms of possible worlds?" (1988, 122).

and so describe nothing.[136] So long as his theory is free of contradiction – a general requirement on any theory – it won't postulate contradictory worlds, and so won't postulate impossible worlds.[137]

Lewis's main concern is the second point above: ensuring that every possibility we *take there to be* is modelled by his ontology. Were his ontology to fail to posit an abundance of worlds it would not provide enough worlds to ensure our modal beliefs are correct, and so his theory would be materially inadequate. Suppose, for example, only two worlds are postulated, our own and another in which there exists only a single rose. Putting Lewis's analysis and this ontology together would yield an error theory of our modal beliefs: they are about a plurality of worlds, but there are not enough worlds to make them true. A principle of plenitude is, for Lewis, supposed to ensure that this kind of deficit of worlds does not arise.

3.2 Ways

I

Lewis generously offered *two* principles of plenitude which aim to delineate the "vast realm of *possibilia*". The first, which I call 'Ways', identifies worlds with ways worlds might be. The second principle, 'The Principle of Recombination', states roughly that there is a world for every combination of things (see §3.4). Lewis's ontology first included Ways, which was then retracted and replaced by The Principle of Recombination.[138] I begin by discussing Ways and its problems, before turning to The Principle of Recombination and its problems. Despite Lewis eventually abandoning Ways, I will argue in §3.51 that its problems also haunt its replacement principle.

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[136] Lewis 1986, 7 fn.3, 165 and 1983, 21. On contradictions being *a priori* false see Lewis 1998, 101.
[137] I won't dwell on this reasoning, but I want to note two points about it. (a) It appears to reveal that Lewis's notion of impossibility is at bottom a narrowly logical notion. This is odd, given that there appear to be impossibilities which are not resolvable into contradictions. For instance, that this table is now red all over and yellow all over, or that currently, James is taller than Helen, and Helen is taller than James, or that I could be born to parents other than my actual parents. (b) The given basis for rejecting impossible objects appears to be in tension with Lewis's acceptance of trans-world individuals which are impossible, despite existing and having non-contradictory properties (see §2.1). This last point indicates that Lewis doesn't *simply* equate the impossible with the contradictory, and so the necessarily false. This seems to indicate that Lewis's own theory allows for a more refined notion of impossibility than both he and some of his commentators recognise.
[138] Lewis 1986, 86.

II

Ways appears to be an integral part of Modal Realism. From the very beginning of *OPW*, Ways plays a fundamental role in the formulation of Lewis's ontology. It is the means by which he teaches the doctrine of Modal Realism and so provides the basis of our understanding of his ontology. He informally introduces Ways on the second page of *OPW*:

> There are so many other worlds, in fact, that absolutely *every* way that a world could be is a way that some world *is*. And as with worlds, so it is with parts of worlds. There are ever so many ways that a part of a world could be; and so many and so varied are the other worlds that absolutely every what that a part of a world could possibly be is a way that some part of some world is.[139]

Ways is also used in what, in §2.1, I called 'Lewis's Argument' for his analysis of modality:

> What actually is the case, as we say, is what goes on here. *That is one possible way for a world to be. Other worlds are other*, *that is unactualised*, *possibilities*. 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. Conversely, since it is safe to say that *no world is any way that a world could not possibly be*, whenever there is some world at which such-and-such is the case, then it might be that such-and-such is the case. So modality turns into quantification: possibly there are blue swans iff, for some world W, at W there are blue swans.[140]

Its official statement comes later in *OPW*, and is given by the following two theses, which aim to postulate an abundance of worlds and their parts:

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[139] Ibid., 2.
[140] Ibid., 5, my italics.

I made it part of my modal realism that (1) absolutely every way that a world could possibly be is a way that some world is, and (2) absolutely every way that a part of a world could possibly be is a way that some part of some world is.[141]

III

What does Lewis *mean* by Ways? There are two readings of this principle which ties worlds and possibilities together. It can be read as a *correspondence* thesis or a stronger *identity* thesis.[142] The correspondence thesis states that for each possibility, there is a world it *corresponds* to. The identity thesis states that for each possibility, there is a world it *is*; each possibility *just is* a world.[143] Either way, there will be no lonely possibilities unmarried to worlds. There are however two noteworthy differences between these readings of Ways:

First, the identity thesis is a view about the *nature* of possibility or ways a world could be, while the correspondence thesis is a view about the *relationship* between ways, whatever they are, and worlds. The identity thesis tells us what kind of entities ways world could be are, viz., spatio-temporally interrelated fusions. By identifying possibilities with worlds, the identity thesis expresses an account of the nature of possibility.[144] By contrast, the correspondence thesis provides a *model* of possibility, but leaves the *nature* of possibility an open question.

Second there is a Rylean intuition which runs counter the identity thesis, but not the correspondence thesis. The intuition is that possibilities cannot be *identical* to worlds because worlds are a piece of real estate, and whereas coffee can be spilt on a piece of real estate, coffee cannot be spilt on a possibility.[145] This intuition is problematic

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[141] Ibid., 86. In the following discussion of Ways I will for simplicity concentrate on thesis (1), and will treat Ways as restricted to (1).

[142] For the identity reading see Lewis (1973, 85) and for the correspondence reading see his ibid., 89-90 and 1986, 90-91.

[143] The readings are stated in terms of complete or fully determinate possibilities. Adjustments must be made for incomplete possibilities. On this see Lewis 1986, 8, 230.

[144] Though I call this an 'identity' thesis, Lewis appears to take worlds to have priority in the following sense: possibilities are understood in terms of worlds, while worlds are not understood in terms of possibilities. There is a corresponding sense at the ontological level that Lewis takes possibilities *really* to be worlds, but not vice versa. The demands of reduction and identity seem to be in conflict here.

[145] This point was suggested to me by Ian Rumfitt. It should be said that coffee *can* be split on something which is possible *because actual*, such as this table I write on. The intuition is that coffee cannot be spilt on *merely*

for the identity thesis, for if worlds and ways worlds could be have different modal properties, they cannot be identical. By contrast, the intuition has no bearing on the correspondence thesis, because the correspondence thesis is uncommitted as to the nature of possibility. In particular, it is not committed to possibilities being concrete objects which is the source of this problem for the identity reading (see §§4.23-4.24 for further discussion of ways the world could be).[146]

IV

I believe the identity thesis expresses Lewis's reading of Ways.[147] He provides four reasons to support it. First, ontological economy. He writes:

> Why distinguish two closely corresponding entities: a world, and also the maximally specific way that world is? Economy dictates identifying the 'ways' with the worlds.[148]

The thought appears to be that ways worlds could be and worlds are so similar – both in their explanatory role and in what goes on 'in' them – that the ways can be identified with the worlds. This is thought to result in a more ontologically economic theory if (a) we assume that ways worlds can be would otherwise be treated as a *sui generis* entity, and (b) if we measure ontological economy in terms of the number of types of entity postulated.[149] Given these assumptions, if ways worlds could be are identified with worlds – a type we already accept in our theory – we will have one less type of thing in our theory, and so we will have a more ontologically parsimonious theory.

Second, conceptual reduction. Lewis aims to reductively analyse modality in terms of quantification over worlds. If ways worlds could be merely *corresponded* to

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possible objects or parts of *merely* possible worlds. The intuition illustrates that we ordinarily treat possibilities and concrete entities to have different modal properties, which suggests that possibilities are not identical to any concrete objects.
[146] If Lewis does accept the identity thesis, then it would appear he must just bite the Rylean bullet, that is, accept that coffee can indeed be spilt on a possibility, and accept that though this is counter-intuitive, it is worth the cost to obtain the reduction his theory promises.
[147] That Lewis endorses this reading is clear from his 1986, 5, 13, 86, 185 and his 1973, 85.
[148] Lewis 1986, 86, my italics.
[149] See Lewis 1973, 87.

worlds, then however successful the analysis of modality may be, there would be the *further* question as to whether ways themselves could be reductively defined. Identifying the ways with the worlds removes this additional question, and may be thought to establish the reductive credentials of Lewis's theory.

Third, explanation. Lewis wants to use worlds both to provide a semantic analysis of modal discourse and also to explain the truth of modal claims. The identity thesis seems better suited than the correspondence thesis to explain the *source* of modal truth. For while a world may correspond with a possibility, and so its existence may be used to correctly 'predict' the truth of a modal claim describing the possibility, the identity thesis takes a given possibility to be identical with a world, and so the world can explain the source of the truth of the claim describing the possibility.

Fourth, meaning. The identity reading is also independently supported by Lewis's account of the meaning of modal expressions, which is an application of his general account of the meaning of theoretical terms. In brief, Lewis takes the meaning of 'possibility' (and other modal notions) to be given by a definite description which denotes an object which plays a certain role in our thought; and he further believes worlds to be the very objects which play this role, so he takes possibilities to be worlds, just as the identity reading has it (for the above argument and its problems, see §§4.25-4.26).

V

Lewis appears to want a principle of plenitude to be a non-trivial general principle about the range of worlds which exist, which is independent of his analysis of modality. Ways appears to meet these requirements. It lays down a condition which not every collection of worlds can satisfy, and so it is non-trivial. It thereby says something about worlds, but about no *specific* world, and so is general.

While its generality means we cannot use it to determine whether some particular proposition describes a possibility, we can use it *together* with facts about what is possible which we are already confident of, to infer facts about which worlds exist. For instance, it appears possible that there be a blue moon, so we can use Ways to

infer that there is at least one world in which there is a blue moon.[150] And of course, we can in principle use it to go the other way too: from the existence of a world we can infer, using Ways, the existence of a possibility. The identification of possibilities with worlds is the crucial principle underlying transit across the bi-conditionals of Lewis's analysis.[151]

3.3 The objection to Ways

I

Lewis ends up rejecting Ways as his principle of plenitude, and tries instead to secure the abundance of worlds via The Principle of Recombination. I now elaborate the reasoning underlying his rejection of Ways, and argue that his rejection of it incurs greater costs than he imagines.

Ways is a modal thesis (it identifies ways worlds *could* be with worlds). So it must be analysed by Lewis's analysis. If Ways is so analysed it turns out to mean 'Every world is identical to some world.'[152] Because this is trivial, it cannot serve as a principle of plenitude; *any* collection of worlds satisfies it – it is true even if there are no worlds.[153] Yet this is a puzzling result: for Ways is the backbone of Modal Realism, and we *seem* to perfectly well understand the apparently non-trivial claim that every way that a world could be is a way that some world is.

There appear two ways to resolve this puzzle. The first is to assume we *do* indeed correctly understand Ways and it is indeed a non-trivial condition on worlds. If this is so – and this of course was our starting point – then we can only conclude that because Lewis's analysis trivialises it, his analysis gets it wrong. If Ways is an

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[150] A trivial non-knowledge extending case: from actual fact that *p*, there is a way the world could be such that *p*, and so by Ways, there is a world at which *p*., viz. the actual world. As Lewis says, "What actually is the case, as we say, is what goes on here. That is one possible way for a world to be. Other worlds are other, that is unactualised, possibilities" (1986, 5).

[151] Note that Ways provides for transit across Lewis's bi-conditionals only when modal claims have *already* been analysed as quantification over ways (as in Lewis 1973, 84). For Ways – an ontological principle – connects ways worlds could be to worlds, it doesn't connect statements (such as 'Possibly p') to worlds, because it doesn't connect modal statements of *any* form to worlds.

[152] Lewis acknowledges as much in his 1986, 87. He also considers analysing Ways in terms of other objects in his ontology, none of which he takes to fair any better than worlds.

[153] Compare to Rayo 2008, 1.

irreducibly modal principle which is part of Lewis's theory, then the theory appears not to be reductive.[154] The second way to resolve the puzzle is to assume that rather than our understanding of Ways being correct, it is Lewis's analysis of modality which is correct. This of course is a position which Lewis is entitled to. Given that the analysis tells us that Ways is a trivially true principle, then because on our initial unreflective understanding of it is non-trivial, it follows that our initial understanding of it is mistaken.

II

Lewis takes the second view, which leads him to reject Ways as the principle of plenitude for Modal Realism. This is, I believe, more costly than he imagines. It is costly in part because it is hard to resist the thought that his analysis of modality fails to get the right result, given that the analysans is trivially true, but the analysandum appears not to be. But a more important reason it is costly concerns what Lewis must say about our understanding of Ways.

In *OPW* Lewis takes us to have understood Ways as a substantial constraint on worlds; this is why he uses it in his exposition of Modal Realism (see §3.2). Lewis wonders what Ways *really* means:

> It *seems* to mean that the worlds are abundant, and logical space is somehow complete. There are no gaps in logical space; no vacancies where a world might have been, but isn't. It seems to be a principle of plenitude. But is it really?[155]

His answer is 'no'; the principle *apparently* means that the worlds are abundant, but is *in fact* trivial. If this is so, then one wonders how we correctly understood Modal Realism, based on a principle which is in fact trivial. If it was trivial how did it appear to work so well? Was this just a matter of luck? Lewis appears committed to the view that our grasp of his Modal Realism was, all along, in fact illusory. Here,

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[154] Note that 'irreducible' here is relativised to Lewis's theory. We cannot conclude from the fact that *Lewis's* theory cannot analyse a concept that it cannot be analysed in some other theory.
[155] Lewis 1986, 86.

Lewis must think of Ways as a didactic ladder we climb in order to see Modal Realism aright. But then isn't an explanation of our *illusion* of understanding owed? If Ways only *seemed* to mean what we thought it meant, how were we deluded, and how could an illusion have done so much work in Lewis's theory? Did it only *seem* to do that work, did we only *seem* to understand Modal Realism? Lewis provides no account either of how Ways could have played a significant role in his theory if in fact it was trivial, or of the semantic illusion he seems forced to think we are under with respect to Ways. And in the light of the work the principle does in his theory (see §3.2) this is surprising. It seems to me that Lewis gets things the wrong way round. Ways *does* mean what we, and Lewis, originally understood it to mean – "that the worlds are abundant, and logical space is somehow complete".[156] We know this better than we know any analysis of what we say. So because Ways is part of Lewis's theory and because he cannot analyse it correctly, his theory appears not to be reductive.

This leads to a connected cost for Lewis. His analysis of modality is not intended to be revisionary; rather it is to be a descriptive conceptual analysis (see §4.1). But his analysis of Ways *is* revisionary. For by saying that our ordinary understanding of it rests on a mistake, the analysis requires us to revise our beliefs about the meaning of this modal claim. In §4.31 I will argue that this scepticism Lewis's theory induces about our ordinary verdicts on the meaning of our modal claims means is not just confined to Ways, and that his theory is much more revisionary than it is often realised as being.

Lewis denies that Ways plays a foundational role his theory. Were Ways the *only* principle of plenitude on the table, then Lewis's theory of modality would face severe difficulties. For Ways appears either to be trivial and so fails to postulate an abundance of worlds, or it cannot be analysed and so fails to be reductive, thereby undermining the analysis' raison d'être.[157] Fortunately, Lewis has a reply which he

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[156] Ibid.

[157] One option I don't discuss is that Lewis could fall back on the correspondence interpretation of Ways. It is only when ways and worlds are identified that the problems described in §3.3 arise. However, as I said earlier (a) the correspondence interpretation of Ways leaves as an open question whether ways worlds could be are reducible, and (b) the correspondence interpretation doesn't provide an explanation of the source of modal truth. As both reducing modality and explaining the source of modal truth are the main goals of Lewis's theory, this option is not attractive for him.

believes allows him to maintain his reductive analysis *and* postulate the abundance of worlds. The replacement for Ways he supplies is The Principle of Recombination. This is, he says, a "*new* way to say…that there are possibilities enough, and no gaps in logical space."[158] He takes it to be a principle of plenitude which can be reductively analysed *and* remain a substantive constraint on the space of worlds. I am sceptical about this, and will argue that (a) it presupposes an irreducibly modal existence claim about *possibilia* (see §3.51), and (b) it doesn't seem to yield the right model of worlds to secure the material adequacy of the analysis (§3.52).

3.4 The Principle of Recombination and its roles in Lewis's theory

I

Lewis's core statement of The Principle of Recombination is that

> anything can coexist with anything else, at least provided they occupy distinct spatiotemporal positions. Likewise, anything can fail to coexist with anything else.[159]

This principle, unlike Ways, certainly doesn't *state* anything about the abundance of worlds – it doesn't even explicitly *mention* worlds. It is a claim about the co-existence of *spatio-temporal* entities, and the claim is roughly that *any* such entity can coexist (or fail to) with any other. It effectively states that there are no modal forces of repulsion or attraction, forcing such objects apart or binding them together.

Note that like Ways, The Principle of Recombination is a *modal* principle. A modal principle in the ontology is compatible with a reductive analysis of modality only if the analysis can reduce the principle. Unlike Ways, there are various ways to do so. For instance, the principle may be reformulated as follows:

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[158] Lewis 1986, 87, my italics.
[159] Lewis 1986, 88. Lewis immediately qualifies the principle, but its unqualified core statement suffices for my purposes.

For each plurality of distinct things, and for each spatio-temporal arrangement of them, there is a world in which only those things in that arrangement exist.[160]

No modal concept appears to be expressed in this principle, so perhaps after all, Lewis *isn't* forced into making a choice between retaining his reductive analysis and obtaining an abundant ontology of worlds. By treating worlds as fusions of spatio-temporal individuals, he Lewis has a way of understanding the variety of worlds in terms of the totality of combinations of the individuals that constitute them. Combinatorial – that is, mathematical – notions go in place of modal notions.

II

I now want to distinguish two readings of The Principle of Recombination. The first reading takes the quantification in it to be actualist, the second possibilist. On the first reading, the objects to be re-combined are drawn from the actual world. On this reading, The Principle of Recombination says that any combination of *actual* objects is possible; it is a claim about actual objects and *their* possible combinations. For instance, suppose, as I hope is the case, that you and I exist. From The Principle of Recombination we can infer four *modal* facts about re-combinations of these actual objects, viz., that we can exist together, that I can exist without you, that you can exist without me, and that we can fail to exist together.[161] Lewis suggests this actualist reading of The Principle of Recombination doesn't go far enough:

it won't do to say that all worlds are generated by recombination from parts of this world, individuals which are possible because they are actual. We can't get the alien possibilities just by rearranging non-alien ones. Thus our principle of recombination falls short of capturing all the plenitude of possibilities.[162]

Alien individuals are defined as individuals which either instantiate properties which are not instantiated in the actual world, or instantiate combinations of actual

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[160] For discussion about the precise non-modal formulation of The Principle of Recombination see Nolan 1996, Efird and Stoneham 2008, and Derby and Watson 2010.
[161] Thanks to Keith Hossack for this example.
[162] Lewis 1986, 92.

properties in a way not instantiated in the actual world.[163] If we take there to be (alien) possibilities involving such individuals, then on its actualist reading The Principle of Recombination will be materially *in*adequate, for no re-combination of actual individuals will generate the alien individuals that figure in alien possibilities. To solve this problem, Lewis should take The Principle of Recombination to quantify unrestrictedly over any object whatsoever, actual or possible. And indeed this possibilist reading of The Principle of Recombination is suggested in two passages. First, Lewis writes that we should understand The Principle of Recombination to quite generally "patch together parts of different possible worlds [to] yield another possible world" where just those parts exist together.[164] In this passage, Lewis takes The Principle of Recombination to say that any number of parts of *any* different world – not limited to parts of the actual world, or worlds generated from *its* parts – can be 'patched together' to form another world.[165] Second, Lewis says that although recombination

> will not *generate* alien worlds out of the parts of this world, it nevertheless *applies* to alien worlds.[166]

In this passage, Lewis admits that we cannot *use* The Principle of Recombination together with actual objects to postulate the full range of worlds. The distinction between 'generate' and 'apply' allows Lewis to hold a compromise position: that while our theory cannot generate alien worlds – because we cannot give the specifications of alien individuals to the theory – if there are some alien individuals, The Principle of Recombination will apply to them. We might put it like this: were we able to specify alien individuals, the theory would generate every alien world in which they are recombined.

III

Lewis believes The Principle of Recombination can take over the role Ways played in Modal Realism.[167] Ways was introduced primarily as an ontological principle,

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[163] Ibid., 91-92.
[164] Ibid., 87-88, slightly amended.
[165] Or more precisely, their duplicates can be.
[166] Ibid., 92, my italics.

used to state the abundance of worlds. By contrast, The Principle of Recombination plays several other roles in Lewis's theory. It is important to distinguish these roles, as it is easy to confuse them:

(a) *ontological*, the principle of plenitude for worlds and their parts.

(b) *psychological*, the method by which we *form* our modal beliefs, by inference from our non-modal beliefs about worlds and their parts.[168]

(c) *epistemological*, a method by means of which modal beliefs can be *reliably or knowledgeably* inferred from non-modal beliefs about worlds and their parts.[169]

For each of these principles, insofar as we can use them in our theorising, we are limited to postulating, imagining or knowing only those worlds we can think of, and so only worlds built out of combinations of *actual* individuals or properties. The principles may *apply* to worlds radically different from our own, but if we cannot think of them, we cannot *use* these principles in our theorising to postulate, imagine or know about them.

3.5 Objections to The Principle of Recombination

I now provide two objections to The Principle of Recombination as a principle of plenitude for worlds. First, I argue that for The Principle of Recombination to be a plausible principle of plenitude, it must be assumed that every object that *could* exist

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[167] For the opposed view that The Principle of Recombination is *not* part of Lewis's Modal Realism, see Efird and Stoneham 2005, 21 fn.1.

[168] Lewis writes: "I think our everyday modal opinions are, in large measure, consequences of a principle of recombination" (1986, 113). And: "We get enough of a link between imagination and possibility, but not too much, if we regard imaginative experiments as a way of reasoning informally from the principle of recombination. To imagine a unicorn and infer its possibility is to reason that a unicorn is possible because a horse and a horn, which are possible because actual, might be juxtaposed in the imagined way" (1986, 90).

[169] Lewis writes that The Principle of Recombination "gives us our best handle on the question what possibilities there are" (2001, 611). It is interesting to compare this with Lewis 1973, where he says that Quinean ersatz worlds "give us an excellent grip on the real possible worlds by their ersatz handles" (90). Quinean ersatz worlds are understood in terms of quadruples of real numbers whose recombinations represent the occupation of space-time by matter. See also Lewis (1986, 114) where he notes some psychological and epistemic limits to The Principle of Recombination. For a good criticism of Lewis's epistemic use of The Principle of Recombination see Rosen 1990, 339-40. It was Shalkowski (1994, 697 fn.11) who made me aware of the different roles of The Principle of Recombination.

does exist, and that the principle quantifies over all of them (§3.51). This assumption appears to bring in irreducible modality into Lewis's ontology.

Second, I argue that The Principle of Recombination appears to yield a materially *in*adequate model of logical space (§3.52). I provide illustrative counterexamples which suggest that we hold a range of modal beliefs which The Principle of Recombination cannot provide for. This is, I take it, largely a consequence of the fact that reductive, combinatorialist theories of modality are committed to a Humean conception of what is possible.[170] And it is this Humean conception which forces serious revision and mutilation of our ordinary modal beliefs.

3.51 Irreducible modality

I

I understand that The Principle of Recombination (a) quantifies over any concrete object whatsoever, actual or possible, but (b) doesn't *postulate* (or '*generate*') every world, because we cannot specify alien individuals in the theory. (a) provides the reason that The Principle of Recombination appears to be a *powerful* principle of plenitude; (b) provides the reason it is *limited* in the context of an ontology which aims to postulate, in general terms, every world that exists. In the light of (b) the comforting thought was supposed to be: though The Principle of Recombination doesn't *postulate* every world, it *applies* to every world (§3.4). We can, it is hoped, feel confident that because the principle seems to work well when applied to a small sample of actual objects[171], there is nothing to prevent it from applying to alien objects in alien worlds too. Yet underling this confidence in The Principle of Recombination lies the following assumption: that all the objects which exist – and which the principle quantifies over – are all the objects which *could be*. This assumption transforms The Principle of Recombination into a plausible principle of plenitude. If this isn't assumed, what reason is there to think that every combination

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[170] By 'combinatorial theory of modality' I mean any theory that defines possibilities in terms of combinations of simple objects. I don't take this doctrine, as it is sometimes understood, to be essentially limited to *re*-combining *actual* objects.
[171] For some examples of Lewis's, see 1986, 88.

of every object according to The Principle of Recombination constitutes an abundance of worlds which suffices to analyse modality? I now develop this point.

II

The Principle of Recombination – as an expression of a combinatorialist theory of possibility – treats possibilities as the products of applying a combinatorial principle to a range of input objects. Combinatorial theories postulate combinations of objects, the range of which is determined by (a) which 'input' objects the theory takes to exist and (b) what particular combinatorial principle/s it employs. The following analogy from John Bigelow is helpful:

> Combinatorialism may be conceived as a kind of Restaurant Theory of the Modal Universe. Something is possible when the ingredients all exist, which constitute its recipe. Logical space is the menu, the list of all the dishes for which the ingredients exist; the actual world is the series of dishes which arrive at our table.[172]

This is useful because it emphasises the dependence, in a combinatorialist framework, of possibilities on the existence of their 'ingredient' objects together, of course, with how they are combined. If such a theory is used as a principle of plenitude, it must assume (a) that sufficient ingredients exist to be combined to form every possibility, and (b) that the principle combining these ingredients quantifies over all of them. A similar point about the dependence of possibilities on their constituent objects in a combinatorialist theory was made by Wittgenstein. He wrote:

> If all objects are given, then at the same time all *possible* states of affairs are also given.[173]

But why would we think that there is a mapping from objects to possibilities such that the range of possibilities can be inferred from the totality of objects, given the right combinatorial principle? The only answer I can think of – besides stipulating

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[172] Bigelow 1988, 41.
[173] Wittgenstein 1961, §2.0124. See also §2.014.

that what counts as possible are those combinations – is by assuming that the domain of objects include every object there *could* be.[174]

To see why Lewis needs to make this assumption, suppose that he doesn't. That is, suppose that there is an object *o* which *could* exist but does not. Given it doesn't exist, it is not quantified over by The Principle of Recombination, which quantifies over only existing spatio-temporal objects. Thus no worlds which include *o* as a part would, given the assumption, be postulated by Lewis's ontology. Yet it seems that given *o* could exist, there are a range of genuine possibilities excluded by this ontology, viz., all the possibilities in which *o* figures. No ontology which excludes these possibilities, yields the full abundance of worlds. The only way I can see for Lewis to go is to equate the totality of objects his theory postulates with the totality of objects there *could* be, and thereby include objects such as *o* in its domain. In effect, Lewis must assume an abundance of *possibilia* to fund an abundance of worlds.[175]

If this line of reasoning is correct, then Lewis must be able to state this assumption explicitly in his theory. The problem is: how can it be stated, whilst avoiding irreducible modality? It seems to me that the only way of specifying the class of *possibilia* is in irreducibly modal terms, using locutions such as 'every *possible* object' or 'every object that *could possibly* exist' or 'every way a part of a world *could* be'.[176] The Principle of Recombination, as a principle which takes objects to worlds, is inevitably silent on how to state the abundance of its input objects; it cannot be reapplied to the input objects indefinitely. But the only other principle of plenitude that appears on offer is Ways, and we already saw that this was irreducibly modal. So The Principle of Recombination, though it appears to be a suitable

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[174] Stalnaker (2012, 1-2) sees Wittgenstein and Lewis as necessitarians. See also Williamson 2013, 1-2.
[175] The trouble, as Lewis puts it, lies in providing "a domain of quantification suited to the topic of modality" (Lewis 1983, 26-27). In this early work Lewis is quite explicit about what is required: "[t]he domain of quantification is to contain *every possible world and everything in every world*" (ibid., my italics). Note that this statement is ambiguous between a modal reading of 'possible world' as *ways a world could be* and a reductive reading as *world*. See §4.24 for discussion of this ambiguity in Lewis's Paraphrastic Argument.
[176] We might resist the view that the modal notion involved in stating the assumption requires *irreducible* modality. For instance, we might try to understand *possibilia* in terms of *worlds*: as all the parts of all the worlds which exist. However, this is clearly unhelpful in the context of combinatorialism. For it is the worlds that we are trying to postulate by means of a grasp of their combinatorial constituents. If we already had a grasp of the range of worlds, we wouldn't need to appeal to a principle of plenitude at all (or at least, only to understand the engineering of worlds).

principle of plenitude for Modal Realism, ultimately seems to require an irreducibly modal assumption.[177]

It is worth noting that whether The Principle of Recombination requires an irreducibly modal existence assumption is independent of the question of whether it applies to or postulates (or fails to apply to or postulate) alien worlds. For supposing, in the best case, that The Principle of Recombination could generate alien worlds, we *still* need a reason for thinking that once we have all the worlds which are all the recombinations of all the objects there are, including the alien ones, we thereby have all the possibilities.

3.52 Material inadequacy

I

In the last section I suggested that The Principle of Recombination is incompatible with Lewis's reductive ambitions. In this section I argue that even if The Principle of Recombination were to reductively generate an abundance of worlds, the resulting theory wouldn't be materially adequate. A materially adequate theory of modality should treat our modal beliefs, as interpreted by the theory, as true according to it. I will argue that in the following revealing instances our modal beliefs are revised by Lewis's theory, which means either propositions we take to be true are determined by it to be false (or vice versa), or propositions which are pre-theoretically undecided, are decided by it one way or the other:

(1) Beliefs about necessary connections.
(2) Beliefs about necessary existence.

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[177] Discussing combinatorial theories of possibility, Bigelow wrote that "The risk with all such theories is that the constraints imposed on combinations will presuppose modality" (1988, 44). The equal and opposite risk is that when there are almost *no* constraints imposed on the *combinations* – as in Lewis's "anything can coexist with anything else" (Lewis 1986, 88) it is the hidden constrains imposed on the initial *elements* themselves which presuppose modality. It is to be expected that a combinatorial principle of plenitude requires an additional existence claim. For such a principle takes 'inputs' to worlds, and to do so it must recognise a range of objects as inputs. Lewis was aware of this. Writing about David Armstrong's actualist combinatorialism, he says that "[w]hat possibilities we get by recombining the elements of the world depends on what those elements are" (1999, 199) 'What those elements are' can be understood both as about the *kinds*, but also about the *range* of elements which exist. Making this existence claim about inputs explicit in Lewis's theory seems to require a Ways-like principle which says that every way a part of a world could be is a way that some part of some world is.

(3) The belief that possibly nothing exists.

Lewis's failure to capture our beliefs about necessary connections or necessary existence appears to be due to The Principle of Recombination being an expression of the Humean denial of necessary connections. While the failure to capture our beliefs about (3) seems to result from the combinatorial nature of The Principle of Recombination – that possibilities are constituted by *existing* objects.

II

Lewis makes it clear that The Principle of Recombination builds in David Hume's denial of necessary connections:

> It is no surprise that my principle prohibits strictly necessary connections between distinct existences. What I have done is to take a Humean view about laws and causation, and use it instead as a thesis about possibility. Same thesis, different emphasis.[178]

The first two examples below aim to show some consequences of accepting a Humean conception of what is possible. According to this conception, no distinct objects are necessarily connected. The way this manifests itself in Lewis's theory can be seen by the following example which limits itself to the connection between two objects: for any objects x and y in any worlds, there is a world w' in which (a duplicate of) x exists but (a duplicate of) y does not.[179] Because there are worlds in which one exists without the other, it seems to follow that x and y are not necessarily connected. So lack of necessary connection comes about because of the great diversity of worlds which Lewis takes to exist; there are too many possibilities to sustain necessary connections. Lewis introduced a principle of plenitude to ensure there are an abundance of worlds – but, as I take the following examples to indicate, The Principle of Recombination seems to postulate *too* many to sustain ordinary modal belief.

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[178] Lewis 1986, 91.
[179] I generally drop 'duplicate' for ease of expression.

III

(1) *Necessary connections*. We appear to believe – or at least, take seriously the idea, even if we are undecided – that there are a range of necessary connections between distinct things. Two things x and y are necessarily connected just in case either x cannot exist without y, or y cannot exist without x.[180] We may distinguish two classes of statements of necessary connection: those about (a) concrete objects, and those about (b) abstract objects. An example from the first class: it is not uncommon, at least in philosophy, to find those who believe that given *they* exist, their parents *must* also have existed.[181] In the idiom of possible worlds, there is no possible world in which they *do* exist, but their parents *don't*. An example from the second class: it is commonly accepted that a set and its members are distinct, but necessarily connected, for if a set exists, so too must its members.[182]

Lewis's theory denies both kinds of necessary connection for different reasons. With respect to the first class of claims, Lewis's view is as follows. If for there to be necessary connections between distinct concrete objects it is required that a concrete object exists in more than one possible world, his theory rules out the existence of any necessary connections. For each concrete object is wholly part of just one world (see §2.1). If it is the case that for two objects to be necessarily connected it is *not* required that they exist in more than one world, what then is required? There seem to be two options in Lewis's thought. First, for x to be necessarily connected to y is for there to be *no* world in which a duplicate of one exists without a duplicate of the other. But The Principle of Recombination clearly rules that there is *always* such a world. For consider a world w in which both x and y exist. By The Principle of Recombination there exists a world for each rearrangement of entities in w. And one such re-arrangement is a world w' in which x exists but y does not. The second way of understanding necessary connection is in terms of counterparts: for x to be

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[180] Note (a) that any number of objects may be necessarily connected, (b) that x's existence may require y's existence, though y's existence not require x's. To say x and y are necessarily connected doesn't say in which object the requirement lies, and (c) a simple analysis of necessary connection in terms of possible worlds doesn't provide the resources to distinguish between necessary existents that require one another, and those that don't, for because there is no world in which necessary existent x exists and necessary existent y doesn't, then they are necessarily connected, even if neither requires the other.

[181] E.g. Kripke 1980, 112-13.

[182] There are also hybrid cases, part concrete part abstract that I do not consider, such as fusions and their parts and instantiated universals and what instantiates them (perhaps also, sets of worlds are a hybrid case). See MacBride 2005, 124-27 for discussion.

necessarily connected to *y* is for there to be no world in which a relevant counterpart of *x* exists but no relevant counterpart of *y*. The Principle of Recombination doesn't directly say anything about this, as it re-combines duplicates, not counterparts.[183] But presumably, so long as *x* and *y* are distinct, and the specification of the relevant counterpart relation for each does not include reference to the other, then there will be worlds where *x*'s counterpart exists and *y*'s does not.

With respect to the second class of claims, which concern abstract objects – for Lewis, sets – the first thing to note is that The Principle of Recombination says nothing about them. For it applies solely to spatio-temporal or concrete objects. If it turns out that some of the entities we count as abstract are in fact reducible to concrete entities, then Lewis can treat them as above. For the rest, Lewis's view might be put as follows. Literally speaking, there are no necessary connections between abstract objects, because for something to be necessary it must be part of a world, and abstract objects are part of no worlds (on Lewis's definition of a world, see §§2.0-2.1). So there are no *necessary* connections between abstract objects. In this way, reality is bifurcated: the concrete realm in which necessary connections make sense, but there are none, and the abstract realm, in which necessary connections don't even make sense (which is a strange view, given that necessary connections between abstract objects such as numbers or propositions is the *paradigm* of necessary connection). Lewis writes:

> Numbers, properties, propositions, events—all these are sets, and not in any world. Numbers et al. are no more located in logical space than they are in ordinary time and space.[184]

For Lewis, sets are not located in logical space *because* they are not located in ordinary time and space – for according to his theory, logical space is *constituted* by concrete worlds and entities therein.[185] However, Lewis proposes a compromise

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[183] Lewis 1986, 88-89.
[184] Lewis 1983, 40.
[185] So like trans-world individuals, these non-concrete entities exist but are strictly impossible, because they are not wholly part of any world (see §2.1). Or, it is perhaps better to say that abstract objects exist but are ineligible for having modal properties.

view, according to which we can quantify over abstract entities *as if* they were parts of worlds. We think of them as falling in the

> least restricted domain that is normally…appropriate in evaluating the truth at that world of quantifications.[186]

In this way, we can understand the possibility and necessity of claims involving abstract objects. Call the 'least restricted domain' of a world its 'outer domain'. Then the question of whether an abstract object *x* is necessarily connected to an abstract object *y*, becomes the question of whether every world whose outer domain includes *x*, also includes *y*. Assuming that numbers are included in this 'least restricted' domain of every world, it will now be correct to say that there are necessary connections between there abstract existences. For instance, the number 2 exists in every world in which the number 1 exists, and so the two numbers are necessarily connected.[187]

The problem with this view is that just as Lewis sees reality as bifurcated, so his notion of necessity has become bifurcated. For necessity with respect to *abstracta* means truth *at* the outer domain of a world, not truth *in* a world. It seems that for Lewis there are two notions of necessity, and so two notions of necessary connection. According to the first, *abstracta* do not stand in necessary connections. This is the sense in which Lewis says "Numbers et al. are no more located in logical space than they are in ordinary time and space." But in a second sense – which Lewis calls a "terminological stipulation"[188] – we may say that they do stand in necessary connections, at least assuming that if *abstracta* such as numbers exist and if they are in the outer domain of each world, they exist necessarily. I take the first sense to be the more important one, expressing as it does Lewis's fundamental metaphysical idea: that logical space *just is* the pluriverse, which is constituted by concrete entities, and in terms of which modality is defined.

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[186] Lewis 1983, 40.

[187] Though because numbers exist necessarily, on a modal account their necessary connection is a trivial matter (see fn. 180 above). It seems an important difference between necessary connections between contingent beings and between necessary beings that necessary connections between contingent beings (such as me and my parents) are (a) sensitive to the identity of those beings, and (b) not necessarily symmetric, whereas necessary connections between necessary beings (such as the number 1 and 7) are (a) indifferent as to the identity of those beings, and (b) are necessarily symmetric.

[188] Ibid., 211.

IV

(2) *Necessary existence.* It is worth first distinguishing between necessary *connection* and necessary *existence*. Two objects can be necessarily connected without either necessarily existing. For instance, while neither I nor my parents necessarily exist, it is plausible to suppose that I am necessarily connected to my parents. Put in terms of possible worlds: the necessary *existence* of *x* is a matter of *x* existing in every possible world; the necessary *connection* of *x* and *y* is a matter of either there being no possible world in which *x* exists but *y* does not, or vice versa.

Consider the possibility of *concrete* necessary beings. As I have noted, Lewis's definition of 'world' already rules out the existence of an individual which exists in more than one world. Were necessary beings such individuals, then Lewis would have to their existence. In Lewis's framework a necessary being is an individual which is not *itself* in every world but has a *duplicate* or *counterpart* in every world.[189] I believe Lewis must deny the existence of a necessary being. Suppose a necessary being is a being which has a duplicate in every world. Is there such a being? For there to be such a being there must be something in each world with the same intrinsic properties. Take for instance one candidate which is a single occupied space-time point. Could this be a necessary being? No, because Lewis allows that there are non-material words, in which objects are not united by spatio-temporal relations.[190] For any candidate object, there seems to exist a world which Lewis countenances which lacks that object; and so it appears that according to Lewis there are no necessary beings.[191] But this response reveals a tension in Lewis's thought: if The Principle of Recombination is *the* principle of plenitude it must postulate all the worlds, understood in terms of recombinations of spatio-temporal individuals. Yet by allowing that there are worlds in which there are no spatio-temporal objects, Lewis undermines The Principle of Recombination as the principle of plenitude.

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[189] Necessary beings and the possibility of nothing are intimately connected. Supposing there were empty worlds – worlds with absolutely nothing in them – there would therefore be no necessary beings. In discussing necessary beings I assume for the time being, and with Lewis, that there are no empty worlds. I take our pre-theoretic opinion to take the possibility of nothing and of a necessary being seriously, and so appears to be in some tension. I discuss the possibility of nothing below.
[190] Lewis 1986, 75-76.
[191] It might be thought that the worlds themselves, not things in them, are the only things of which it can be said that they are necessary. Though of course Lewis's analysis of necessity doesn't allow for this.

Suppose now that instead of being understood in terms of duplicates, a necessary being is understood as a being which has a counterpart in every world. Is there such a being? Lewis's answer would appear to be yes: for, setting aside twins and other such problems, each individual has an object in each world it is most similar to. Indeed, if this is all necessary existence demands then every being turns out to be a necessary being. But because this definition trivialises necessary existence, it cannot be what we mean by it. To detrivialise a counterpart-theoretic understanding of necessary beings, restrictions must be imposed on the counterpart relation. On this view of necessary existence, are there necessary beings? The only way there can be a necessary being x, is if x has *relevant* counterparts in every world. For instance, if we wonder whether The Queen is necessary, we wonder whether she has a relevant counterpart in every world, and a relevant counterpart must be a *person* etc. The Queen is, on this view, not a necessary being, for there are worlds where no human counterparts exist. Suppose we turn again to space-time points, might a single space-time point be a necessary being by the above criteria? The problem again seems to be that Lewis allows for worlds with no space-time points, and so arguably no relevant counterparts for our point. And the same point appears to hold for any other candidate necessary being. And again, this puts into question the generality of The Principle of Recombination, for Lewis accepts there are non-spatio-temporal worlds which cannot be generated by it.

What about abstract objects? The Principle of Recombination understood as *the* principle of plenitude, effectively excludes *abstracta* from having modal properties, and so necessary existence. As I argued above, Lewis has a problem reconciling philosophical opinion about modal features of *abstracta* with his framework of logical space as constituted by concrete worlds. At bottom, in my view Lewis must say that *abstracta* are not eligible to enjoy modal properties – such as necessary existence – at least, not in the same *sense* as concrete objects are eligible. For instance, to say sets necessarily exist is to say that they are included in the outer domain of each world – it isn't to say, as per Lewis's analysis, that the sets exist as *part of* each world.[192] This suggests that Lewis can either deny that abstract objects

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[192] This raises the question: are worlds themselves necessary beings? Lewis calls them "non-contingent" (1986, 130) and he says of the pluriverse "It could not have been different" (ibid., 80). But worlds cannot literally be

can enjoy necessary existence, or accept it and be more explicit about the two senses of necessity, and the implications of this for his theory.

V

(3) *Possibly nothing exists.* The proposition "Nothing exists" appears to be possibly true, so an abundance of worlds should contain such a possibility. Yet it presents difficulties for a combinatorialist principle of plenitude, for it seems the very way such theories take possibilities to be constituted, excludes it. There are two brief points to begin. First, if there *are* any necessary existents – for instance, space-time points or sets – then the question of whether there is a possibility of nothing is answered in the negative. For if there is a being which exists in every world, then there are no worlds in which nothing exists – and the possibility of nothing *at least* requires this. Second, distinguish between the possibility of nothing *at all*, from not *much at all* existing. It is the former that is the possibility in question. Some mythological stories suggest the world came from nothing, and we might go the other way to make vivid the possibility in question. Suppose, if we can, that there exists an omnipotent God who destroys our universe together with anything else that may exist, and then kills Himself. Now nothing remains of what existed, so absolutely nothing exists. It is this final state which is the possibility in question.[193]

I will now argue that The Principle of Recombination excludes the possibility of nothing. Note that in Lewis's framework, the possibility of *F* is analysed in terms of the existence of *F*s in some world. So the possibility of a unicorn is a matter of there being a unicorn in some world. Plausibly, the possibility of nothing is a matter of

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necessary, for necessity is understood in terms what exists in every world, and worlds themselves do not exist in any world. If they are necessary in an extended sense it is one Lewis doesn't explain.

[193] Or, more mundanely, consider everything there is, and subtract one part of it after another until nothing is left. See Baldwin, 1996. These of course are just stories. And it is unclear whether in *imagining* these stories we are really *conceiving* of the possibility of nothing. Wittgenstein appeared to be ambivalent about our ability to think of or imagine this possibility. He writes: "Each thing is, as it were, in a space of possible states of affairs. *This space I can imagine empty*, but I cannot imagine the thing without the space" (1961, §2.013, my italics). But he later came to the view that: "it is nonsense to say that I wonder at the existence of the world, because *I cannot imagine it not existing*" (1965, 9, my italics). Other philosophers have thought there might have been nothing. Efird and Stoneham, for instance, go so far as to say that any view which denies the possibility of nothing "would run counter to both intuition and theory" (Efird and Stoneham 2005, 22). If we presuppose the possibility of nothing by taking seriously the question 'why is there something rather than nothing?' then all the more so do metaphysicians need to make sense of the possibility of nothing. The question is taken seriously by a range of metaphysicians, such as Lowe and others (in Goldschmidt 2013), Rescher (1984), Nozick (1981), and Van Inwagen and Lowe (in their 1996). For critical discussion about Nozick and Rescher's theories see Kusch 1990.

there being nothing in some world, that is, a world with no things as parts. Yet it appears that Lewis cannot countenance such a world. According to Lewis's definition of a world, it is a fusion of its parts. Where there is a world, there are parts which constitute it (combined as per The Principle of Recombination). Because parts are somethings, where there is a world, there is a something. This shows that 'there being nothing in some world' is a contradictory condition. Complete possibilities are, for Lewis, worlds, yet the possibility of nothing is nothing, and necessarily, no world is nothing.[194]

It appears that if (a) the possibility of nothing is correctly understood as a world which has no things as parts, and (b) this is impossible in Lewis's system, then Lewis must deny that there is such a possibility, and in the following wonderful passage, this is what he does:

> If a world is a maximal mereological sum of spatiotemporally interrelated things, that makes no provision for an absolutely empty world. A world is not like a bottle that might hold no beer. The world is the totality of things it contains, so even if there's no beer, there's still the bottle. And if there isn't even the bottle, there's nothing there at all. And nothing isn't a very minimal something. Minimal world there can indeed be. There can be nothing much: just some homogeneous unoccupied spacetime, or maybe only one single point of it. But nothing much is still something, and there isn't any world where there's nothing at all. That makes it necessary that there is something. For it's true at all worlds that there is something: it's true whenever we restrict our quantifiers to the domain of parts of a single world, even if the only part of some world is one indivisible nondescript point. Of course, if we don't restrict quantifiers from the standpoint of one world or another, then all the more is it true that there is something rather than nothing: there is logical space, the totality of the worlds in all their glory.[195]

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[194] It's worth stressing here that on Lewis's view, worlds are not *representatives* of possibilities, they *are* possibilities (see §3.2). Our world could on some scheme *represent* nothing – but it is not that very possibility. So, while the possibility of nothing plausibly requires a world with nothing in it, Lewis's conception of worlds as fusions of parts under The Principle of Recombination, seems unable to provide for it.
[195] Lewis 1986, 73.

I have noted above that it is not clear whether Lewis thinks there is any common denominator between worlds, be it points of space-time or just some spatio-temporal stuff, because it allows that there are non-spatio-temporal worlds. Yet it is true that given what a world is for Lewis, there can be no worlds where there is nothing. An ontological conception of possibility, according to which modal claims describe possibilities, and possibilities are objects, simply doesn't allow for the possibility of nothing. Combinatorialism is such an ontological conception of possibility, and no combinatorial view of possibility would seem able to capture the possibility of nothing (for discussion, see §6.1).

What worlds are and what they do are tightly connected for Lewis. Worlds are spatio-temporal objects which 'take up' or 'fill' logical space. They leave no room for the possibility of nothing. As Lewis put it,

> there are no gaps in logical space; no vacancies where a world might have been, but isn't.[196]

VI

We have seen that the Principle of Recombination commits Lewis to the impossibility of necessary connections, necessary beings and nothing. Therefore it is revisionary of both ordinary modal belief and considered philosophical opinion, much of which appears to endorse the existence of some necessary connections, while being undecided about necessary beings and nothing. Further revisions of ordinary opinion should be expected from Lewis's theory, given its Humean picture

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[196] Ibid., 86. Nothings haunt Lewis's materialism, for instance, holes (1983, 3-9) and the void (2004, 277-90). Absences, he counsels, are: "spooky things, and we'd do best not to take them seriously" (ibid, 283). There is another approach, I haven't discussed, that Lewis appears to take towards the possibility of nothing, which results in the same conclusion. Roughly, it is that if there can be nothing, there is a proposition to the effect that there is nothing. However, Lewis holds that "truths must have *things* as their subject matter" (1999, 206) and that "[a]ny proposition has a subject matter, on which its truth value supervenes" (2003, 25). He writes: "truths are about things, they don't float in a void" (1999, 207). But truths about the nothing *do* seem to float in a void, for no positive characterisation of their subject matter is possible. For Lewis, all truths are about reality understood as constituted by *what* exists, and *how* what exists exists. He writes: "There is a most inclusive subject matter: *being*. Differences in being come in two sorts. There are differences in whether something is, and there are differences in how something is" (2003, 25). The proposition that nothing exists isn't about *something* which exists, and so there are no *ways* for it to exist. Lewis's rejection of the possibility of nothing is part of his general rejection of any view in which there are brute facts of reality, modal or otherwise, that conflict with this conception of the subject-matter of propositions (1999, 207). The possibility of nothing is a possibility without a subject-matter, and so for Lewis no proposition corresponds to it.

of what is and is not possible. For such a picture is really a narrowly logical view of what is possible: anything is possible, so long as it isn't contradictory. Ordinary belief takes there to be less possibilities and more necessities than this picture allows.

Furthermore, it seems to me to be problematic that a theory of modality says *so much* about what is and is not possible. It would be better were such a theory to remain neutral on topics of substantial philosophical controversy, particularly a theory that aims to accurately capture our concept of modality. For instance, if God is defined as a necessary being, Lewis's theory allows us to conclude that the possibility of such a being is at best merely epistemic – ignorance masquerading as necessity.[197] But should a theory of modality so easily pronounce on the existence of God – or the existence of anything else, for that matter?

A final note about this theory is that its impossibilities (of necessary connection, of necessary existence and of nothing) must ultimately be brute facts of the pluriverse. For though we can in a sense explain why they are impossible by reference to The Principle of Recombination and the analysis of modality, *why* the pluriverse is this way is ultimately a datum we must accept.

3.6 Assessment

Lewis's theory of modality needs a principle of plenitude. A central problem with Lewis's use of it, I have argued, is that every way the principle is formulated appears to lead to conflict with one of two minimal conditions placed on theories of modality: (a) the reduction condition, and (b) the material adequacy condition (see §1.2).

With regard to the reduction condition, in §3.3 and §3.51 I suggested that any way to state that there is an abundance of worlds appears to require irreducibly modal notions, and so to violate that condition. The point applies to both of Lewis's formulations of the principle of plenitude, but is more problematic for The Principle

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[197] I paraphrase Lewis 1999, 198.

of Recombination, because Lewis takes it to be the *correct* principle of plenitude for his Modal Realism. We should expect this problem to arise for any *reductive* attempt to, as Fine put it,

> extend the arena upon which the possibilities are realized to include what goes on in each possible world.[198]

If the actual world doesn't provide the resources to yield the full abundance of worlds, then the only reason I can see to think that the non-actual *will* do is if the non-actual is thought of in modal terms. Lewis's theory in particular appears paradoxical: for it uses an ontology of worlds – specified by covertly and irreducibly modal principles – to reduce modality, thereby giving with one hand what it takes with the other.[199]

With regard to the material adequacy condition, in §3.52 I argued that Lewis's theory requires revision of a range of our modal beliefs, treating some propositions we take as true to be false (and vice versa), and deciding on propositions we remain undecided about. This appears to mean that Lewis's theory fares badly with respect to the material adequacy condition. I suggested this is due to Lewis's theory being combinatorialist, and so reflects a Humean conception of what is possible, which is not in conformity with common belief. Not only is this a problem as registered by the material adequacy condition, but revision of modal belief is an internal problem for Lewis, whose conservative methodology prizes the preservation of belief and treats revision of belief as serious cost (see §2.2 and Chapter 5).

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[198] Fine 2005, 1.
[199] Compare with Shalkowski 1994, 675-76.

Chapter 4: Analysis

4.0 Introduction

I

Lewis's ontology postulates an array of worlds, which according to his conceptual analysis, we unwittingly talk about when we speak modally. In the previous chapter I suggested that there is a tension between his ontology of worlds and his analysis of modality: the only way, it seems, to design an abundant ontology of worlds is by appeal to irreducibly modal resources which undermine the reductive ambitions of the theory. In this chapter I ask: does Lewis's analysis capture our *concept* of modality? I therefore focus on Lewis's analysis rather than his ontology, and so on the *conceptual* rather than *material* and *reductive* adequacy of his theory.[200]

Can a theory of modality be reductive and materially adequate but nonetheless conceptually inadequate? I think so. For suppose a given theory *is* reductive and provides a non-modal definition of our modal notions in terms of the existence of worlds and what is true of them. The fact that an analysis of modality usefully and creatively exploits a model of worlds doesn't mean that it *correctly captures* our modal notions. An analysis of modality may both be materially adequate and reductive but *still* wrong.[201] We can, after all, propose to define any concept any way we like. The question is: what *basis* is there for thinking the concepts are connected in the way proposed? With respect to Lewis's theory we must ask: even supposing there *is* an abundant ontology of worlds describable in non-modal terms that *could* be used to reduce modality, *should* it be so used? It is not enough to provide a methodological justification along the lines 'it is fruitful, let us define things so', for not only will such an appeal be limited to those who share the same view of what counts as fruitfulness, but it seems reasonable to think that there is a fact of the

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[200] I take for granted that Lewis's analysis is reductive. On the question whether it is a conceptual analysis, see the following section.
[201] I assume that there is a matter of fact which makes definitions correct or incorrect, but I leave as an open question what the nature of such facts are. Are they, for example, facts about how we use words, or facts about concepts, or facts about the natures of the things defined?

matter which definitions answer to and which such a justification ignores (see §5.4 for more reasons why this methodological justification is problematic).

I approach the question of conceptual adequacy as follows. In §1.2 I explained what I meant by a conceptually adequate analysis as a matter of the analysans and analysandum saying the same thing. How do we test for this? Three criteria that might be applied are as follows: First, if two propositions say the same thing, it should be a conceptual *a priori* matter that they do. In our case, modal claims and claims about worlds should be connected by *a priori* conceptual truths. There may be metaphysical connections between things which fall under some given concepts, but such connections are not purely conceptual because they cannot be discovered merely by reflection on the concepts in question. A physicalist analysis of mind, for instance, aims to reveal metaphysical connections, as it depends on certain non-conceptual truths which are revealed in the argument for it (for instance, a causal closure principle). A *conceptual* analysis on the other hand must reveal two concepts as *conceptually* connected, a connection which can be discovered *a priori*.

Second, if two propositions say the same thing, our understanding of one is sufficient for our understanding of the other. Sider may be right in advising a healthy scepticism about

> the extent and value of definitions. Philosophical concepts of interest are rarely reductively defined. Still more rarely does our understanding of such concepts rest on definitions.[202]

Yet if a definition of a concept k is correct it must allow us at least to *understand k*, and the contribution k makes to truths involving it. Whether our understanding is *constituted* by grasp of the correct definition is another question.

Third, if two propositions say the same thing, they should have the same ontological commitments. The analysans of a conceptual analysis is typically understood as

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[202] Sider 2011, 9.

giving the *real* content of the analysandum, as such, the ontological commitments of the analysans are the same as the *true* ontological commitments of the analysandum. In this chapter I provide evidence for the view that the reasons Lewis gives to connect modal claims with claims about worlds do not pass these tests. To the extent to which the tests are reliable, Lewis's analysis is unsatisfactory.

II

Lewis's analysis is a *conceptual* analysis which analyses modality in terms of quantification over worlds (see §4.1).[203] Modal words and sentences are taken to disguise the deep quantificational structure of the concepts or thoughts they express. Modal claims, on this view, just are disguised quantifications over worlds.[204] We need a good reason to think this is so, that is, a reason to think not merely that the connection between worlds and modality *can* be made out, or is fruitful for some purpose, but that it is *correct*.[205]

The requirement for a justification of the analysis is made all the more pressing because there are several reasons to be suspicious of it, including the following two:

(A) The analysis suggests that modal concepts, which we do not take to be ontologically committing, are in fact so. We can see Lewis's analysis as following into a pattern Stephen Yablo has observed:

> The problem with these analyses [which bring in objects to analyse concepts not overtly existence involving] is not just the unwelcome ontology; it is more the ontology's intuitive irrelevance to the notions being analysed.[206]

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[203] Recall that when I talk about Lewis's treatment of modal concepts as quantificational, I always mean the analysis in terms of first-order quantification over worlds, as per §2.0.

[204] Lewis writes: "[I]nsofar as we understand modal reasoning at all, we understand it as disguised reasoning about possible beings" (1983, 10). The model for Lewis's understanding of 'disguise' is Russell's Theory of Descriptions, according to which sentences involving definite descriptions "are *disguised* existential quantifications" (ibid., 88, my italics).

[205] I already in §2.1 looked at one argument, which I called 'Lewis's Argument', for his analysis of modality. In this chapter I look at other of this arguments.

[206] Yablo 2008, 191. Compare with Morton 1973, 394.

The definition of modal notions in terms of existence seems deeply unintuitive. This is very clear from Lewis's analysis. Suppose S says 'Trolls don't exist but they could'. Lewis treats what S says by applying two steps: first, he treats the first conjunct as having a hidden world parameter. It means 'Trolls don't exist in the actual world'. Second, he treats second conjunct as analysed as per his analysis to mean 'There is a world in which Trolls exist'.[207] Now a fair reply by S to Lewis might go as follows: 'When I say that Trolls don't exist I simply mean they don't exist – there are no hidden parameters, I am not talking about any worlds. Likewise, when I say that Trolls *could* exist, I'm not talking about any worlds either. I don't believe that Trolls exist, so a fortiori, I don't believe they exist in other worlds.' If S explicitly *denies* there exist other worlds in which Trolls exist, and Lewis interprets him as saying that they *do* exist in other worlds, then Lewis makes S's beliefs inconsistent. Lewis's analysis appears to attribute *implicit* beliefs to subjects whom *explicitly* deny them. In this circumstance Lewis must either say that we don't know what our own beliefs really are, or that those beliefs should be revised.

Even when it appears we can analyse a notion in a theoretically fruitful way, and when we think that fruitfulness is a reason to think the analysis is right, there are strong *non*-theoretical reasons *not* to. Suppose it were discovered that a certain kind of insect exists in such variety and number to match quite precisely the structure of moral truth. A great philosopher proposes defining moral notions as quantifiers over insects. Perhaps it could be done, and a naturalistic account of moral notions could finally be accomplished. But could it be right that in making moral claims we were, all along, just talking about insects? Could 'cutting edge' philosophy really discover what historiography and hermeneutics could not, that the Sermon on the Mount was about…insects? That we *can* quantify over insects to obtain a materially adequate analysis, doesn't mean we *should* define the moral in entomological terms.

To convince those of us who have a powerful and palpable *sense* – not a theory – that morals are not insects, the theorist would need to advance a good *reason* to think a conceptual connection holds between moral notions and quantifiers over insects. For a revisionary picture of the *content* of our moral claims is being proposed,

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[207] If Lewis only interprets the second conjunct as containing a hidden parameter, then he will interpret S as believing the contradictory claim that Trolls don't exist (simpliciter) but there is a world in which Trolls exist.

indeed it is an *error* theory of that content. It treats us as right about the truth-value of modal claims, only because we are wrong about their content – they do not concern, say, *sui generis* moral properties, but are rather non-moral predications about insects.[208] Given that this interpretation is revisionary, it needs justification.

(B) Even supposing that modal discourse really *is* a quantificational discourse – and so modal claims purport to be about some *things* – suspicion remains about identifying these things as *worlds*. First, worlds other than the one we inhabit do not appear to be part of our ordinary ontology. Given we don't ordinarily think there are other worlds, we are reluctant to accept a theory which both postulates them. Second, given we don't believe there are other worlds, a theory that interprets us as talking about them is not only suspicious it lands us in contradiction, as I suggested above. To avoid contradiction, we must either deny that this worldly interpretation of modality is correct, or else revise our beliefs about the existence of worlds to fit the interpretation of their content as being about worlds. Third, if modal discourse is accepted as quantificational discourse, we would want a reason to think the quantifiers range over *worlds* rather than one of the other available candidates. A central part of Lewis's reason for preferring worlds, is that only worlds allow for a reduction of modality, and no other candidate does. Appeal to the value of reduction in justifying Lewis's theory is discussed in detail in Chapter 5.

Lewis's theory is usually rejected because it is committed to the pluriverse, which is regarded as an *untenable ontology*. But I see as even more problematic the fact that his theory treats our modal discourse as quantification over worlds, which I take to be an *untenable analysis*. For just as we may be unable to accept a theory whose *ontology* we cannot bring ourselves to believe[209] – because it is so widely at odds with our ordinary ontology – so we cannot accept a theory whose interpretation of the *content* of our beliefs we cannot bring ourselves to believe, because it is so widely at odds not only with what we take to exist, but what we *take* ourselves to

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[208] An error theory of the *content* of a class of claims says that we are in error about their content; an error theory of the *truth-value* of a class of claims says that we are in error about their truth-value. Whether a theory is an *error* theory is relative to what we take the truth or content of a class of claims to be.

[209] Lewis employs a similar argumentative strategy in arguing for why he doesn't take seriously the idea that possible worlds are constituted by numbers or sentences. See 1973, 84-89.

believe.[210] This problem of content isn't, as it is sometimes thought, reducible to the ontological problem, but is a problem in its own right.

Lewis takes the subject-matter of our modal discourse to be about worlds – which we have been unwittingly talking about worlds our whole lives. And equivalently, when anyone has spoken of genuinely different worlds – as perhaps physicists or priests or philosophers have – they have thereby unwittingly been speaking of different possibilities. However not only (a) do we not take our modal beliefs to incur ontological commitments to worlds, but more importantly, (b) we do not see, in general, our modal beliefs as *incurring* such special commitments, or indeed any special commitments at all.

III

The plan for this chapter is as follows. I first provide evidence for the view that Lewis's analysis is a *conceptual* analysis, that is, an analysis which alleges a conceptual connection between modal and quantificational concepts. Lewis accepted that *argument* is required to show that the analysis is correct. I examine three of his arguments for the existence of this conceptual connection (§4.2). I find, and this is my first conclusion of this chapter, that none of his arguments clearly succeed. Further, I argue that there are good reasons to think that there is no conceptual connection between modality and quantification over worlds (§4.3). First because what we understand when we understand modal claims and what we understand when we understand existence claims about worlds appears to be different (§4.31), and second, because while existence claims about worlds bring with them commitment to worlds, modal claims do not appear to be (§4.32). Failing these tests of conceptual adequacy suggest, if the tests are reliable, that Lewis's theory is unsatisfactory.

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[210] What it is that prevents us from believing this latter claim, that is, what it is that we know or believe that makes such a view implausible is an important question. Some kind of intentional knowledge is certainly a candidate explanation.

4.1 Lewis's analysis is a conceptual analysis

I

Lewis's analysis does not logically follow from his ontology (see §2.1). So we can treat it separately and inquire into its conceptual adequacy, independently of whether there *are* the worlds it purports to speak of. In this section I argue that Lewis's analysis is a conceptual analysis.[211] This prepares the ground for the rest of the chapter, where I ask: is it the *correct* conceptual analysis of modality? The reason for stressing the point in this section is that it is not *obvious* that just because Lewis offers an analysis of modality, he is thereby offering a *conceptual* analysis.

At a certain distance, analyses in philosophy all look the same, having the same dull form: *s* iff *r*. Such statements are often glossed as 'giving the truth-conditions of' or 'giving an analysis of' a class of sentences. But this clarifies things very little, given that very different projects are presented in this form. They include: giving the *meaning* of a class of claims, saying what objects or facts *make them true*[212], saying what kind of facts *constitute* a target class, or saying which facts the target class *supervene* on.[213]

To briefly illustrate the current diversity of views about analysis, I take two recent philosophers of modality. First, Williamson's analysis of modality in terms of counterfactuals is intended neither to directly given the meaning of our modal concepts nor explain the source of their truth. His analysis occurs in an *epistemological* setting, and its point is to show that modal statements are logically equivalent to counterfactuals. He takes this to demonstrate that creatures with the "ability to handle" one kind of statement, can also "handle" the other kind.[214] Second, by contrast Shalkowski is interested in the plausibility of what he calls "wholly metaphysical" analyses of modality, which aim to show that modal facts are

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[211] I don't say it is *only* a conceptual analysis. It may have other, perhaps explanatory, roles in addition, but it is *at least* a conceptual analysis.

[212] These two projects are sometimes assimilated, perhaps for the reason that meaning and truth-conditions are often equated.

[213] Note that it is not that any analyses strictly *say* these things – strictly speaking, an analysis *says* nothing beyond the bi-conditional it expresses. It is what analyses are *used for* in the context of a philosophical theory which has a theoretical goal, which makes it permissible to speak loosely of what an analysis *says*.

[214] Williamson 2007, 160.

"ultimately, complexes of non-modal facts".[215] This understanding of analysis is not about relationships between *concepts*, but about relationships between *facts*.

The projects Williamson and Shalkowski discuss couldn't be more different – one logical or epistemological, the other metaphysical – but both are presented with the same superficial gloss: 'giving an analysis of modality' or 'giving the truth conditions of modal claims'. The different theoretical settings yield different kinds of analysis with different roles in their respective theories. The difficulty of understanding, just by looking at it written out, what kind of analysis is being put forward by a theorist and what its purpose is in their theory, motivates clarifying what kind of analysis *Lewis* is putting forward, and what *its* purpose is.

II

The enterprise to which Lewis's account of modality is a contribution – giving an analysis or defining modality – is not at all clear. This is for two reasons. Firstly because of the difficulty of specifying what it is to give an analysis of something. To identify a theory as 'giving an analysis' is, as Ian McFetridge forcefully put it,

> …merely to locate, in the vaguest way possible, a perhaps empty class of putative philosophical projects. For we have, I think, no clear view of what the task, peculiarly philosophical, of defining, explaining, analysing or explicating words, notions or concepts, actually *is*: no single unchallenged account of the constraints to which…in general, a project thus delineated, should be subject.[216]

Secondly, because Lewis himself does not clearly state how he thinks his analyses should be understood or what their purpose (or purposes) are. As Daniel Nolan points out,

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[215] Shalkowski 1994, 671.
[216] McFetridge 1990, 29-30. For similar concerns see Oliver 1996, 50.

> [o]ften Lewis just goes ahead and produces an analysis, without telling readers exactly what he thinks he is doing.[217]

For instance, nowhere in *OPW* does Lewis say clearly: 'I am giving a conceptual analysis of modality, by which I mean thus-and-so, for the purpose of such-and-such'. Indeed, he instead uses evasive descriptions of what his analysis achieves. For instance, he writes that according to his analysis "modality *turns into* quantification"[218] or "necessity *amounts to* universal quantification"[219] or "modality de re…*is* quantification over possible individuals."[220] But without explanation, such statements clarify little. Further, Lewis takes the manifesto of *OPW* to be showing the

> many ways in which systematic philosophy goes more easily if we may presuppose modal realism in our analyses.[221]

And so appears to be justifying his analyses – including that of modality – more by the reductive and explanatory work they can do for systematic philosophy, than by their getting things right conceptually.

III

Despite this lack of clarity, from the little that Lewis says explicitly, it is fair to say that he takes philosophy to be tasked with giving conceptual analyses and he takes the analyses he gives to be conceptual analyses, including the analysis of modality. I now provide evidence that this is how Lewis saw things. First, he says that the object of analysis is twofold, to

> reduce our burden of primitive notions, and to make tacit understanding explicit – not to bootstrap ourselves into understanding what we didn't understand at all beforehand.[222]

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[217] Nolan 2005, 213.
[218] Lewis 1986, 5, my italics.
[219] Ibid., 7, my italics.
[220] Ibid., 8, my italics.
[221] Ibid., vii.
[222] Ibid., 154.

The two objects of analysis are two reasons to think of Lewis's picture of analysis as *conceptual*. (i) Analysis aims to reduce the 'burden' of primitive concepts, that is, decreasing the number of concepts required to understand some subject-matter. Primitive notions are the concepts contained in, but not definable in, a theory (see §5.1). Lewis sees the aim of analysis being driven by the need to show that certain concepts which are thought to be primitive can, in fact, be reductively *defined*, and so our understanding of them can be illuminated. By tying them both to definitions, Lewis connects the motivation for conceptual analysis with that of reduction. (ii) A condition on that definition is that it does not revise or eliminate our concepts – nor does it seek to justify or undermine them – but aims merely to make "tacit understanding explicit". The analysis thereby aims to reveal the concepts in terms of which we ordinarily, though implicitly, understand the target concept.

Second, discussing his analysis of mind, Lewis writes that "conceptual analysis" can

> reveal the simple formula — or anyway, the much less than infinitely complicated formula — whereby, when we know enough, we can pick out a mental feature of the world from all the countless other features of the world that likewise supervene on fundamental physics.[223]

And similarly

> [m]ental features of the world…are not at all beyond our ken. Finite assemblies of particles – us – can track them. Therefore there must be some sort of simplicity to them. Maybe it will be a subtle sort of simplicity, visible only if you look in just the right way. (Think of the Mandelbrot set: its overwhelming complexity, its short and simple recipe.) But somehow it must be there. Revealing this simplicity is a job for conceptual analysis.[224]

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[223] Lewis 1999, 303. This can be compared to the similar question of what simple formula is grasped whereby finite beings can grasp an infinitely complex thing as our mother tongue. See Foster 1976, 1.
[224] Lewis 1999, 297-98.

Analysis here appears to be conceptual. We understand a subject-matter *F*, but *how* we do so, that is, by means of which concepts, is unclear. Analysis should reveal the conceptual means by which we actually understand *F*– not those by which we *should* understand it.[225]

Third, in *Counterfactuals* Lewis writes that

> I believe there are worlds where physics is different from the physics of our world, but none where logic and arithmetic are different from the logic and arithmetic of our world. This is *nothing but* the systematic expression of my naive, pre-philosophical opinion that physics could be different, but not logic or arithmetic.[226]

The 'nothing but' can be read conceptually: the content of the modal belief *just is* the quantificational proposition. Whether this is the correct reading of the passage above depends on exactly what the 'systematic expression' relation preserves, which Lewis doesn't explain.

Fourth, Lewis makes *fairly* clear in *OPW*, despite the hedging mentioned above, that his analysis is conceptual:

> I myself, of course, do think that modal operators are quantifiers over possible worlds…I believe that there exist frames which afford *correct interpretations* of the modal operators.[227]

Lewis is not just after a *useful* interpretation, he wants one which gets our modal concepts – which are often expressed by modal operators – *right*.

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[225] Note that the picture of our concepts that emerges from Lewis's passage cannot *simply* be extended to any other concept. According to this passage, our simple concept of mind reflects a pattern in nature. But concepts which are not about natural objects – such those of number or modality – cannot easily be understood in terms of 'tracking' patterns in nature. Having said that, and despite the absence of a plausible epistemology for it, Lewis's analysis of modality is probably the nearest thing we have to such a 'tracking' treatment of modality.

[226] Lewis 1973, 88, my italics. See also ibid., 92.

[227] Lewis 1986, 20, my italics.

Fifth, we know Lewis was sensitive to the different functions analysis can play in different theoretical settings. For instance, he makes this good point about Armstrong's use of analysis:

> Armstrong has an unfamiliar notion of analysis. Analysis is not, primarily, a quest for definitions. Rather, it is a quest for truth-makers.[228]

Armstrong's notion of analysis is unfamiliar to Lewis because it is not primarily a quest for *definitions*. This indicates that for Lewis analysis *is* ordinarily a quest for definitions. An analysis which is a quest for a definition – in the sense that it is an attempt to provide a correct interpretation, not a stipulation or revision of its meaning – is a conceptual analysis.

IV

That Lewis provides a conceptual analysis of modality is the standard view among his commentators.[229] Chihara is perhaps the most explicit. He asks – in fact, is the only one who directly asks – the right question: "Is Lewis proposing an analysis of our modal concepts?"[230] And answers:

> Lewis is not advocating replacing our crudely characterized pre-analytic modal concepts by his realistic possible worlds ones. No, he takes himself to be providing the correct analyses of these concepts and "correct interpretations" of the modal operators.[231]

To back up this interpretation, he adds that Lewis's endorsement of a reading of The Principle of Recombination – understood, psychologically, as the basis by which we form our modal beliefs (see §3.4) – is

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[228] Lewis 1999, 203.

[229] One dissenting voice appears to be Shalkowski. He thinks Lewis "appeared to flirt with conceptual analysis" in his Paraphrastic Argument in *Counterfactuals*. But that "Though he continued to endorse the argument, it confers no serious epistemic warrant on his key ontological thesis and, so, plays no role in the mature development of his metaphysical programme in *OPW*. There the main general strategy was to use something like an inference to the best explanation" (Shalkowski 2010, 170). It should be emphasised however, that Shalkowski is discussing arguments Lewis gave for the existence of worlds, not for the legitimacy of his analysis of modality.

[230] Chihara 1998, 81.

[231] Ibid., 82.

additional evidence that Lewis regards his possible worlds account as giving us a correct analysis of our modal concepts.[232]

Melia likewise frames Lewis's analysis as conceptual:

> The extreme realist promises to provide a reductive analysis of the concepts *necessarily* and *possibly*…[233]

John Divers and Melia take the

> major explanatory ambition that is associated with…[Lewis's theory is] that of providing an analysis of the concept of possibility.[234]

In his review of *OPW*, Stalnaker takes Lewis to hold that

> our modal discourse…is discourse about this plurality of worlds….Lewis's arguments will make us think more than twice about how to understand modal discourse, as well as the many other *conceptual* phenomena to which the possible worlds framework has been applied…[Lewis makes a] semantic claim that statements about what might or must be true are to be analysed as quantifications over these universes.[235]

McFetridge treats Lewis's analysis as *both* giving a conceptual analysis *and* also as explaining the truth of modal claims, at once. He interprets Lewis as saying that

> our various modal operators are to be interpreted as various kinds of quantifiers over…worlds. Our modal judgements, when true, are true in virtue of how things stand in this domain of possible worlds. The aim of modal thought is accordingly to represent how things are in this realm.[236]

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[232] Ibid.
[233] Melia 2003, 110. See also ibid., 109.
[234] Divers and Melia 2002, 17.
[235] Stalnaker 1988, 117-18, my italics. Also see page 122 and his 2003, 40 for related points.
[236] McFetridge 1990, 141.

Ralph Wedgwood holds Lewis's analysis to belong to a species of analysis according to which

> modal claims are really only *abbreviations* of statements about what worlds there are, and about what is the case at those worlds.[237]

William Lycan wrote that

> Lewis intends his possible-world analyses of modal sentences to give those sentences' respective truth-conditions in this Davidsonian sense or something relevantly like it…[where 'this Davidsonian sense' is characterised as "the core component of the sentence's locutionary *meaning*"].[238]

Finally, Michael Loux interprets Lewis as saying that a

> realistic interpretation of *possibilia* is *merely* a *formalisation* of our common-sense thinking about modality.[239]

Though differing in detail – including perhaps the employment of different notions of 'concept' – each of these commentators takes Lewis's analysis to be some kind of conceptual analysis which defines modal notions in quantificational terms.

4.2 Lewis's arguments for the conceptual connection

In the light of the view that his analysis is a conceptual analysis, we can ask: what is Lewis's *reason* for connecting our modal and quantificational concepts, as per his analysis? He doesn't appear to think the connection is obvious, or that we can discern it by introspection. Rather, he takes it to require argument. He proposes two kinds of argument, which provide two different ways of connecting modality to quantification over worlds. The first kind aims to justify the analysis of modality

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[237] Wedgwood 2000 413, my italics.
[238] Lycan 1979, 294.
[239] Loux 1979, 10, my italics.

indirectly, by justifying the whole theory of which it is a part. I postpone discussion of this argument until Chapter 5, where I ask what the justification for the whole of Lewis's theory of modality is. The second kind of argument is a *direct* argument which aims to justify the analysis in the face of doubts we may have about defining modality in terms of worlds (as in §4.0). It comes in two varieties: *translation* arguments and *theoretical identification* arguments. The first variety uses the putative translatability of modal discourse as quantification over worlds to justify the conceptual connection. This can be done in two ways: *with* explicit rules of translation (see §§4.21-4.22), or *without* such rules (see §§4.3-4.4). The second variety of argument uses the identifiability of possibilities with worlds to justify the analysis (§§4.25-4.26). In the following sections (§§4.21-4.26) I examine whether either of these two varieties of argument succeed in establishing an *a priori* conceptual connection between modal claims and quantification over worlds.

4.21 Translation with explicit rules

Lewis appeals to the following evidence, in attempting to establish the translatability of modal discourse as non-modal quantification over worlds: that modal discourse, as formalised by Quantified Modal Logic (QML), can be translated by some fairly simple *explicit* rules into sentences of Counterpart Theory (CT), a first-order non-modal language which quantifies over worlds and their parts. In his 'Counterpart Theory and Quantified Modal Logic'[240] Lewis proves the translatability of QML into CT by means of a translation scheme. He elaborates the idea behind the scheme as follows:

> Counterpart theory and quantified modal logic seem to have the same subject matter; seem to provide two rival ways of formalizing our modal discourse. In that case they should be intertranslatable; indeed they are. Hence I need not give directions for formalizing modal discourse directly by means of counterpart theory; I can assume the reader is accustomed to formalizing modal discourse by means of modal operators, so I need only give directions for translating sentences of quantified modal logic into sentences of

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[240] Lewis 1983, 26-38. I assume some familiarity with the arguments of this paper in this and the following section.

counterpart theory….If the translation scheme I am about to propose is correct, every sentence of quantified modal logic has the same meaning as a sentence of counterpart theory, its translation; but not every sentence of counterpart theory is, or is equivalent to, the translation of any sentence of quantified modal logic.[241]

Based on this passage, we may attribute the following argument for the correctness of his analysis to Lewis. 'The justification for analysing modal notions in terms of quantification over worlds (and their parts) is that for every modal claim, there is a non-modal claim which quantifies over worlds (and their parts) which has the *same meaning*. What is the evidence for this view? It is the proof that QML can be translated by CT by a small number of simple rules. The fact that QML is taken to formalise at least a significant chunk of our ordinary English modal discourse, means that for that chunk CT provides non-modal translations of it. For the remainder of our modal discourse that QML cannot formalise, CT can *directly* translate and without rules. We thus have good reason for thinking the analysis of modality in terms of quantification over worlds and their parts correctly reflects the connections which hold between our modal concepts. The proof provides the main reason, and the direct translation fills out the rest of the picture.' I now both clarify and critique this argument.

4.22 Clarification and critique

I

Does translation by means of explicit rules provide a foundation for the analysis of modality? Lewis certainly thinks so, and rather than trading intuitions about what the correct analysis is, he takes his translation scheme to *demonstrate* that the meaning of modal sentences is given by non-modal sentences quantifying over worlds and their parts.[242] I suggest that this interpretation of his proof makes three assumptions about the epistemology of translation, which are, if true, not a matter of proof, and

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[241] Ibid., 29.
[242] Ibid.

this makes his argument appear much weaker than it initially seems, and requires Lewis to say much more than he does in its defence.

II

To be used as evidence for the view that counterpart theoretic claims provide the *meaning* of our modal discourse, Lewis's argument assumes: (i) that we can determine that a class of ordinary modal claims have the same meaning as sentences of QML[243], (ii) that we can determine there are sentences of CT which have the same meaning as English modal sentences, but for which there exists no formalisation in QML[244], and (iii) no other rival translation scheme is as good as his. I first discuss (i) and (ii) together, and then come to (iii).

Without (i) holding, a proof that QML can be translated by CT may just be a game of symbols. It is only because we can determine that QML is *itself* taken to translate our modal discourse, that a proof of the translatability of QML to CT is significant for the conceptual analysis of modality.[245] With respect to (ii), it is assumed that we can determine that for a significant sub-class of modal sentences of English, that each member can be paired with a sentence of CT, which gives the meaning of the English sentence. The basis of Lewis's claim that CT gives the *real* content of modal claims, is in part due to the existence of the class of sentences of English that CT can but QML cannot translate.[246]

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[243] Lewis writes: "I can assume the reader is accustomed to formalizing modal discourse by means of modal operators" (ibid.). This formalisation is a *translation* of a fragment of natural language modal discourse into QML. It is clear that Lewis doesn't think that all modal discourse can be so translated, because he takes there to be some modal sentences of English which have no correct formalisation in QML (see ibid.).

[244] CT can translate sentences which QML cannot correctly formalise. Lewis writes: "If the translation scheme I am about to propose is correct…not every sentence of counterpart theory is, or is equivalent to, the translation of any sentence of quantified modal logic. Therefore, starting with a fixed stock of predicates other than those of counterpart theory, we can say more by adding counterpart theory than we can by adding modal operators" (ibid., 29-30). The evidence for this is found by using English as a 'neutral' language, and showing that there are sentences of it which CT can translate and QML cannot translate.

[245] There is however some evidence that Lewis *doesn't* think that QML formalises our modal discourse. He writes: "What is the correct counterpart-theoretic interpretation of the modal formulas of the standard language of quantified modal logic? – Who cares? We can make them mean whatever we like. We are their master. We needn't be faithful to the meanings we learned at mother's knee – because we didn't" (1986, 12). This is puzzling on my interpretation, for if QML simply *formalises* a fragment of modal discourse, then its symbols inherit their meaning from that discourse, and so we are *not* their master, any more than we are of any word of English that we *did* learn at mother's knee. Perhaps Lewis's point in the above passage is that it is the symbols *box* and *diamond* which may be used to mean what we like. Once, however, they have been defined in terms of our original modal concepts, we are no longer their master. We are masters of what meaning we may associate with arbitrary symbols, but not of symbol-meaning pairs.

[246] Lewis 1983, 29.

What is important here is the epistemic point, that our ability to determine whether English sentences can be – as in (i) – translated into QML or – as in (ii) – into CT, exploits our powers of *judgement*, and is not a matter of *proof*. Determining the truth of (i) appears to depend on intuitive judgements about when a sentence of English is correctly translated by QML. Determining the truth of (ii) appears to depend on intuitive judgements about (a) when a sentence of English is *in*correctly translated into QML, and (b) when a sentence of English is correctly translated into CT. The kind of intuitive judgements required to sustain (i) and (ii) go well beyond intuitions about truth-values of sentences.[247] For in judging that some sentence of English has the *same meaning* as a sentence of QML or CT is not the same as judging that the two sentences have the same truth-*value*. The judgements required are about meaning or, at the very least, truth-*conditions*. And no explicit rules govern or guide translation from English into an artificial language, or the other way round, and arguably no rules could. In the absence of rules, we make an unaided intuitive judgement about when two sentences have the same meaning. (As Quine pointed out, in a discussion about the interpretation of temporal discourse – specifically, about whether it is really a matter of quantification over times – a central "difficulty of establishing a mechanical routine for translating words into symbols" is the existence of "ambiguous statements of ordinary language" which "call for [a] sympathetic reading and an element of implicit psychologizing; and these are *essential* factors in translating words into rigorous symbolism."[248] It seems that for Quine, the existence of ambiguity in natural language means that if sentences of artificial languages are to translate what we mean in a natural language, unaided judgments as to the correctness of a proposed translation from natural language to an artificial language are often necessary in determining whether a given sentence of natural language is ambiguous, and whether the translation into an artificial language is correct.)

The following diagram represents Lewis's picture of the translational relations of English, QML and CT. The arrows denote the 'is translated by' relation, where hard lines mean that *every* sentence of the language, or the relevant fragment of it, can be

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[247] See Hazen 1979, 319-24.
[248] Quine 1965, 91, my italics.

translated in the direction of the arrow, and the dotted lines mean that *some* sentences of the language can be translated in the direction of the arrow. The basis for the translation – intuitions or explicit rules – is indicated.
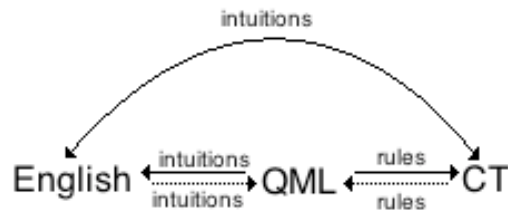
Lewis seems to accept the centrality of intuition in determining correct translation. For instance, in 'Counterparts of Persons and Their Bodies',[249] as part of an argument that his translation of a certain modal sentence in counterpart-theoretic terms is correct, Lewis brings into play the consideration that

> if I contemplate the propositions I express by means of…[the target sentence, and its putative translation]…it seems to me that they are the same.[250]

In *OPW*, Lewis makes explicit his abandoning the formalisation of modal claims in QML when such translations break down, and rather to use "the resources of modal realism *directly*,"[251] This means increasing the reliance on intuitive judgments of whether modal claims of English and quantifications over worlds have the same meaning. Following Lewis's 'direct' method, we first contemplate the propositions expressed by the two sentences, and then use introspection (that is, ask ourselves) whether they have the same meaning. I suggested in §4.2 that Lewis's appeal to *argument* to found his analysis was supposed to avoid appeal to *introspection* – it now seems that he may still require use of it, and so the journey from introspection to proof has come full circle.

To summarise the main point about (i) and (ii): Lewis's translation scheme is relevant to determining the meaning of our modal discourse only if we accept the reliability of our *intuitions* about: (a) the meaning of our modal discourse in English,

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[249] Lewis 1983, 47-54.
[250] Ibid., 53. For other examples of this method see his 'Anselm and Actuality' in ibid., 10-12.
[251] Lewis 1986, 13.

(b) the meaning of sentences in QML and CT, and (c) the truth of sentences stating the synonymy of sentences of English and QML or of English and CT. Such intuitions are direct, in the sense that they appear unmediated by a (readily articulable) translation scheme, and so not dependent on explicit rules. As a consequence, the translation scheme alone doesn't provide irrefutable *proof* that the real meaning of modal claims is quantification over worlds and their parts. The translation scheme is, rather, part of an argument that depends on our intuitive verdicts on a range of semantic questions, none of which are straightforward. Lewis would need to have said more about how the epistemology of translation for it to be clear how he came to these verdicts and how they can be verified.

III

I now turn to problems for (iii), the view that no other rival translation scheme to Lewis's is as good as his own. Suppose that the above problems vanish, and that we accept that Lewis *has* provided a translation of our ordinary discourse in counterpart-theoretic terms. What precisely has been shown? Has it, in particular, been shown that modal claims quantify over worlds and their parts? There are two interrelated problems with thinking so: (1) there are rival counterpart theoretic translations, quantifying over entities other than Lewisian worlds and their parts, (2) connectedly, counterpart-theoretic translations may themselves be translated back into a modal language which would leave the primacy of the counterpart-theoretic translation in doubt.[252] (1) and (2) would have to be ruled out to have confidence in Lewis's theory. I now say more about these two points.

(1) While CT translates modal claims as being about worlds, worlds in Lewis's understanding of them as concrete entities, are inessential to his proof. Hazen makes the point that

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[252] I have until now used 'counterpart-theory' or 'CT' to refer to *Lewis's* counterpart theory. In recognition of the various versions of the theory, I now use 'counterpart-theory' to refer to any theory which analyses *de re* modality in terms of counterparts of some kind. 'CT' continues to refer to Lewis's counterpart theory.

adoption of a counterpart-theoretic semantics is compatible with taking possible worlds to be purely abstract structures, with the same ontological status, whatever it may be, as the structures studied in pure mathematics.[253]

So even if CT is right to the extent that modal claims quantify over *something*, and that their truth-conditions involve counterparts, we need a further reason to prefer Lewis's version of the theory rather than another, which quantifies over something other than worlds and their parts. There are many different views about what entities a counterpart theory should be understood as quantifying over – so many, that the mere fact that any one of them can translate our modal discourse provides no reason for thinking that *that* translation gives *the* meaning (and so the subject-matter) of the discourse.[254] Fara and Williamson ask

> What reason is there to suppose, independently of a translation scheme that *demonstrates* it, that *de re* modal claims have anything to do with an object's counterparts?[255]

But it seems that even if a translation scheme *did* demonstrate a connection between CT and QML, this isn't *sufficient* reason for thinking that *de re* modal claims have anything to do with an object's *Lewisian* counterparts, until it is also shown that CT provides a *better* translation of modal discourse than do non-Lewisian counterpart theories.

Lewis could reply that CT is superior to any other counterpart theory because it, and no other such theory, provides the basis for a *reductive* treatment of modal claims. However there are three problems with this reply. (A) in order that Lewis's translation is materially correct, we must look to its ontology too. In setting out CT, Lewis writes that

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[253] Hazen 1979, 319-20.

[254] For a survey of some of those theories see Melia 2003. The point just made is similar to Quine's complaint that "Models afford consistency proofs; also they have heuristic value; but they do not constitute explication. Models, however clear in themselves, may leave us still at a loss for the primary, intended interpretation" (Quine 1972, 492).

[255] Fara and Williamson 2005, 453.

the domain of quantification is to contain every possible world and everything in every world.[256]

In other words, there must be an abundance of worlds and their parts – every world there could be, and every part of a world there could be, must exist. CT requires a principle of plenitude if it is to provide the basis for a materially adequate translation of modal discourse. In the last chapter I outlined some problems involved in specifying a principle of plenitude for worlds, one of which was that no satisfactory reductive principle is available. This weakens the advantage Lewis's theory has over his rivals, if that is, reduction is taken to be advantageous. (B) if we take possible worlds to be purely abstract mathematical structures or some other non-modal entities, as some believe we can, then Lewis's isn't the only reductive semantics on offer. (C) we must ask whether reductive translations are indeed superior. It is hard to see how the project of discovering what we mean by our modal claims and the project of producing the simplest non-modal account of the source of modal truth could possibly converge, such that finding the best reductive translation would take us closer to discovering what we *mean.* I discuss this further in Chapter 5.

(2) Let us now suppose that CT provides the best counterpart-theoretic translation of modal discourse – could we *now* take this translation to establish the correctness of his analysis? No, for we would also have to establish: (a) the *priority* of the non-modal translation of modal discourse over the original English or QML discourse as, for instance, a better representation of its true logical form. So for a given reductive analysis, *p* iff *q*, there is a reason for taking the non-modal *q* to be an illuminating analysis of *p*, but not the other way round. (b) It must be established that no better *non*-counterpart-theoretic translation of modal discourse is available, including that there is no way to translate the counterpart-theoretic claims back into a *modal* language.[257] These two points must be established before Lewis may legitimately claim his to be the best counterpart-theoretic translation of modal discourse, and so the most credible theory; so there is much more work to be done before that claim may be made. And so much more work remains to be done before it can be said that

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[256] Lewis 1983, 27.
[257] See Lowe 1995, 10. And see Fara and Williamson 2005 for the view that in a sufficiently rich modal language, counterpart-theoretic sentences can be translated into it. See also Prior and Fine 1977.

translation with explicit rules can be recruited to justify Lewis's analysis of modality.

4.23 Translation without explicit rules

We have just seen that the rigorous translation of modal discourse, which connected modal claims to quantificational claims by means of explicit rules, turned out to require a range of unaided intuitive judgements about the content of both kinds of claim, and so turned out to depend on assumptions about the epistemology of translation which were not susceptible to proof, which meant the argument for the analysis of modality turned out not to be as rigorous as first thought.

Why not, rather than attempting to establish the connection between worlds and modality via the putative connection between artificial languages, instead argue for this connection in a natural language, the original home of our modal concepts. And rather than trying to rigorously *prove* the connection, aim to establish the connection by appeal to *intuitions* about the meaning of sentences in this natural language? The reliance on intuition could even be seen as advantageous if presented as an 'ordinary language' or 'paraphrastic' argument.[258] This is precisely what Lewis does in his infamous argument in *Counterfactuals*, which I now discuss.

His argument runs as follows:

> I believe that there are possible worlds other than the one we happen to inhabit. If an argument is wanted, it is this. It is uncontroversially true that things might be otherwise than they are. I believe, and so do you, that things could have been different in countless ways. But what does this mean? Ordinary language permits the paraphrase: there are many ways things could have been besides the way they actually are. On the face of it, this sentence is an existential quantification. It says that there exist many entities of a certain description, to wit 'ways things could have been'. I believe that things could have been different in countless ways; I believe permissible paraphrases of what I

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[258] I follow convention in sometimes referring to the following argument as 'The Paraphrastic Argument'

believe; taking the paraphrase at its face value, I therefore believe in the existence of entities that might be called 'ways things could have been'. I prefer to call them 'possible worlds'.[259]

The argument begins with what is presented as a paradigm case of uncontroversial modal belief: that things could be otherwise than they are. Via a chain of paraphrases, the content of that belief is identified with that of a non-modal quantificational claim about entities called 'possible worlds'.[260] Because these paraphrases are in English, no explicit rules can be given to prove their correctness. Rather, in the absence of a rigorous proof, the force of the argument depends on: (a) the *intuitive* force of each paraphrase in the chain; that two claims mean the same is thought to be intuitively recognisable, and (b) the entitlement to interpret what is said at face-value. The argument is based around a paradigm case of modal belief, but it is clearly expected to be extendable to any modal belief.

It is important to note that Lewis presents this as an argument for the existence of worlds: because the real content of our modal discourse is quantification over worlds, and because we hold some modal claims to be true, we are thereby committed to the existence of worlds. Its point is to combat the view that worlds are "suspect foundations" for his analysis.[261] The argument is aimed at convincing us that worlds– though they are not normally recognised as such – are homely entities which we all accept under other names or descriptions. Lewis takes himself to be making explicit what we ordinarily implicitly understand – quantification over worlds is the 'systematic expression' of our ordinary modal discourse.[262] Worlds are then not a theorist's dream, they are what the ordinary person's modal beliefs are about. Lewis's point is that given we *all* believe in worlds, if there is a problem with them, it is a problem for *us all*. I, by contrast, am interested in this argument as an argument for a view about the *content* of modal claims. Lewis takes us to be committed to worlds because he takes the real content of modal claims to be quantifications over worlds. So his argument for the existence of worlds crucially involves an argument about the content of modal claims. This means we can use

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[259] Lewis 1973, 84.
[260] A paraphrase, like a formalisation, is just a translation of a certain kind.
[261] Lewis 1973, 84.
[262] Ibid., 88.

Lewis's argument for our ontological commitment to the existence of worlds as an argument for the view about the content of modal claims. This argument can then be taken to justify his analysis of modality.

The central differences between this translation argument, and the argument on the basis of explicit rules, is that in this argument (i) no explicit rules support the translation of modal discourse proposed, and relatedly, (ii) no rigorous proof is given of the translation. Instead, paradigm cases are given, which are taken to be extendable throughout our modal discourse.

Based on Lewis's argument above, the following argument for the correctness of his analysis may be attributed to him: 'The justification for analysing modal notions in terms of quantification over worlds is that for every modal claim, there is a non-modal claim with the same meaning. What is the evidence for this analysis? It is the translatability of paradigm ordinary modal sentences of English, by ordinary non-modal sentences of English, which can be immediately recognised. The translatability of modal sentences of English to non-modal sentences quantifying over worlds provides good reason for thinking the analysis of modality in terms of quantification over worlds correctly reflects the connections which hold between our modal concepts.' I now both clarify and critique Lewis's attempt to found his analysis of modality on The Paraphrastic Argument in *Counterfactuals*.

4.24 Clarification and critique

I

We can represent Lewis's Paraphrastic Argument as follows:

> (0) S believes that things could be otherwise than they are. (Assumption)[263]
> (1) Things could be otherwise than they are iff there is a way things could be which is different from the way things actually are. (Analytic truth)

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[263] I leave out of this representation of Lewis's argument his premise that things could have been different in *countless* ways. Lewis needs this for his argument that we are committed to a *plurality* of worlds. This premise can be removed, thereby simplifying the argument, without derailing the current focus on *content*.

(2) 'There is a way things could be' is correctly interpreted as 'there is an entity which is a way things could be'; 'the way things actually are' is correctly interpreted as 'the entity which is the way things actually are' – call this last entity 'a' for short. (By the 'principle of face-value interpretation', for which see below.)

So, (3) things could be otherwise than they are iff there is an x which is a way things could be and $x \neq a$. (By 1, 2)

(4) 'A possible world' means an entity which is a way things could be. (Stipulative definition)

(5) Things could be otherwise than they are iff there is a possible world x and $x \neq a$ (By 3, 4)

So, (6) S believes that there is a possible world x and $x \neq a$. (By 0, 5)

II

The steps in this argument are as follows. The argument develops the content of the initial modal belief. The argument can perhaps run smoother without the embedding of the modal proposition in a belief context and the problems about opacity that come with it. Lewis emphasises the belief context because he wants to argue we are committed to the existence of worlds. It isn't enough for this purpose to show that the modal proposition p is in fact a quantificational proposition q. He also needs the premise that we hold p true. In the context of an argument about content, however the belief setting in (0) and (6) is an unnecessary distraction, and can be treated as stage setting.

(1) is meant to be obvious, and so not to require argument. Lewis says 'ordinary language permits' this paraphrase.[264] This indicates that he takes the truth of (1) to be analytic and our recognition of its truth to be based on our understanding of the sentence. (2) is not meant to be obvious. Lewis thinks we should take the apparent existential quantification in (1) at 'face-value'. He appeals to the general maxim of 'face-value interpretation': unless we have good reason to think otherwise, if some quantificational locution appears to be an existential quantification, it is.[265] Lewis

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[264] Lewis 1973, 84.
[265] Ibid.

takes there to be no good reason not to interpret the quantification in (1) at face-value, so he treats there being ways things could be to be a matter of there being entities of some sort. By similar reasoning, we should treat the apparent singular term 'the way things actually are' as denoting the unique entity which is the way things actually are.[266] (3) follows by defining the relevant expressions in (1) as per (2). (4) is intended to be a matter merely of stipulation, resolving to *call* entities which are ways worlds could be, 'possible worlds'. (5) follows by defining the relevant expression in (3) as per (4). Finally, (6) then defines the initial content of the modal belief in (0) 'things could be otherwise than they are' as 'there is a possible world x and $x \neq a$', as per (5).

III

The Paraphrastic Argument is often dismissed as an argument for the existence of worlds. But does it work as an argument for the quantificational content of modal claims? There are three problems, (i)-(iii) below, I see with the argument: the first two concern ways the world could be, the third concerns what 'possible worlds' means.

(i) Lewis's principle of face-value interpretation, underwrites (2). This principle instructs us to take "seeming existential quantifications in ordinary language at their face value" unless the following conditions hold: (a) the interpretation is known to "lead to trouble" and (b) there exists another interpretation which is known not to.[267] However, this principle offers little guidance; what *counts* as trouble is unclear, so what *leads* to trouble is too. To illustrate this point, consider the following example of Jonathan Lowe's. If 'The grin on John's face is broad' is true, then the apparent singular term 'The grin on John's face' denotes, on the face-value approach, an existing object. Furthermore, if treated at face-value 'John is wearing a broad grin' is to be regimented along the following lines: 'For some x, x is a grin and x is broad and John is wearing x'. According to Lowe this "grossly overinflated ontology" of grins certainly counts as trouble.[268] Consider the parallel with ways. 'The way things

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[266] Lewis 1986, 5.
[267] Lewis 1973, 84.
[268] Lowe 1995, 510.

are' also appears to behave like a singular term[269], but just as we may be sceptical as to whether 'the grin on John's face' denotes an object, we may also be sceptical as to whether 'the way things are' denotes an object. 'There is a way things could be which is different from the way things actually are' appears to quantify over ways.[270] But just as we may be sceptical as to the first-order regimentation of 'John is wearing a broad grin' so to the first-order regimentation of the ways-sentence.[271] The principle of face-value interpretation appears unable to guide interpretation; it doesn't provide for a way of navigating the range of different views as to what counts as trouble. For this reason, it seems unable to support (2). Furthermore, because the principle is not obvious, and nor is it justified, its use in the context of an 'ordinary language' argument raises some suspicion.

IV

(ii) Lewis appears to endorse the view that we can quantify over objects only if we have a criterion of identity for them. A criterion of identity is to be understood as a condition the grasp of which is required in order to determine whether, for objects x and y and kind K, x is the same K as y. For instance, if x and y are sets and K=sets, then x is the same K as y iff x and y have the same members. With respect to ways, Lewis appear to juggle two thoughts: we do *not* ordinarily appear to have a criterion of identity for ways[272], but at the same time, given that we quantify over them we *must* have a criterion of identity for them. He writes:

> it might happen in three different ways that a donkey talks iff three possible
> individuals, very different from one another, are donkeys that talk. It scarcely
> seems possible to cover the entire infinite family of numerical modalities
> unless we resort to the pre-existing apparatus of numerical quantification. Then

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[269] Yablo, for instance, writes: "'The way the world is,' 'the way it would have been if so and so had happened,' 'the ways it could have been' – these look for all the world like noun phrases. It stands to reason then that they at least purport to denote entities of some sort" (2008, 195).
[270] Lewis 1986, 13.
[271] A similar point applies to mass terms, such as 'water'. Quantification over water is not quantification over an *entity* which is water.
[272] See Lewis 1986, 86-87.

we need some *entities* to be the 'ways' that we quantify over. My candidates are the possible worlds and individuals themselves, or else sets of these.[273]

The 'apparatus of numerical quantification' is first-order logic, and Lewis takes that apparatus to require entities with a criterion of identity with which to identify with ways.[274] In this manner, discourse about ways is rehabilitated as discourse about entities.

There are two connected questions about ways which are worth distinguishing: first, is it plausible to identify ways things can be with worlds? and second is there a general criterion of identity for ways? Starting with the first, Lewis appears to hold that ways things could be x and y are identical just in case x is the same possible world as y.[275] Note that if 'possible world' were to mean, as it appears to mean in Lewis's Paraphrastic Argument, 'a *way* the world could be' this obviously provides only a circular criterion of identity for ways, which would not allow for the reduction of modality. Lewis must take 'possible world' to mean *world*, and so the criterion of identity for ways things could be is the criterion of identity for worlds: x and y are the same way just in case they are the same world, and they are the same world just in case they are maximal spatio-temporal fusions of the same parts in the same spatio-temporal relations (see §2.1). However, ways things could be and spatio-temporal fusions appear to have very different properties, and so seem not to be identifiable. We can bring this out by considering four Rylean intuitions:

(i) A world is a piece of real estate, and while coffee can be spilt on a piece of real estate (by being spilt on some of its parts), it cannot be spilt on a way things could be. The property of being-spilt-on-by-coffee seems to be exemplifiable by worlds but not by ways, so worlds and ways things could be appear distinct.

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[273] Ibid., 13, my italics. It is the attempt to identify ways things could be with some entity that prevents Lewis stating a principle of plenitude. See §3.3.

[274] Lewis's treatment of ways things could be can be seen as an answer to Quine's point about the possible fat man in the doorway (Quine 1961, 4). Lewis recognises this: "Quine has complained that unactualized possibles are disorderly elements, well-nigh incorrigibly involved in the mysteries of individuation. That well may be true of any unactualized possibles who lead double lives, lounging in the doorways of two possible worlds at once. But I do not believe in any of those. The unactualized possibles I do believe in…do not pose any special problems of individuation" (1973, 87).

[275] This approach idealises ways for things to be as *complete*. Incomplete ways for things to be are understood in terms of the complete ways.

(ii) Van Inwagen, in a similar vein, asked:

> How could one suppose that the (unrealised) possibility that the universe be thus-and-so is a thing that has a mass of 3.4×10^{57} grams and is rapidly expanding?[276]

A way things could be seems to have no mass or size and so seems not to be correctly identified with something which has mass and size. Indeed, the explanation for why ways things could be seem unable to be identified with worlds is that *ways* appear to be non-concrete. Consider the way you look tonight. You may weigh eight stone, but does it even make sense to ask how many stones the way you look tonight weighs?

(iii) Worlds have proper parts – indeed these parts come into their criterion of identity – but ways do not appear to have any proper parts. Take, again, the way you look tonight. What are its parts? Of course *you* have parts (legs, shoulders, etc.) but the way you look tonight is not you. If *beautiful* is the way you look tonight, then the way has parts only if being beautiful does, but seems hard to make sense of the view that being beautiful has parts. Or take the way Christoph plays the organ on Sunday – say, *with gusto*. Though the performance has parts – a beginning, a middle and end – it is hard to makes sense of the idea that the way he plays – *with gusto* – has parts.[277]

(iv) If ways things could be are identical to worlds, then they must have the same modal properties (those of worlds). But the *way* the actual world is and the actual world *itself* differ in their modal properties: the actual world could have been a different way, but the way the actual world is *couldn't* have been a different way – it *is* that way![278] Compare: the table could be a different colour than it is, a certain shade of brown, but that certain shade of brown couldn't be a different colour than it is – it *is* the colour that it is.

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[276] Van Inwagen 1986, 199.
[277] For a similar point, see Block and Stalnaker 1999, 18 fn. 5.
[278] This is similar to a point Fine makes in his 2005, 216.

I now turn to the second question: whether there is a general criterion of identity for ways. We often speak as if there are answers, in particular contexts, to the question of whether two ways are identical. For instance, the way the weather is today is the same is it was yesterday, viz. *rainy*; or the way he walks is the same as the way she walks, viz. *vigorously*; or the way you look tonight is the same as the way you always look, viz. *beautiful*. It seems doubtful, however, first, that we can supply a criterion of identity even for each of these ways. For a criterion of identity is a principle, but there seems no *principled* way to determine, for any way, whether it is the same or different from any other.[279] Ways don't seem determinate enough and alike enough for questions of their identity to be settled by a general principle.

Identifying ways things could be with worlds appears unpromising, and similar problems would appear to beset any attempt to identify ways with entities for which we possess a criterion of identity. The reason is that any such attempt will make *arbitrary* stipulations about when any two ways are the same way. Identifying ways with entities for which we possess a criterion of identity will mean we will be able to answer questions about whether two ways are one and the same, which are ordinarily unanswerable. So criteria of identity may be *supplied*, but they will be arbitrary, and would appear to require the revision of beliefs about the identity of ways. This is not to say that ways do not have associated criteria of identity, nor is it to say that there is no fact of the matter about their determinate identity conditions.[280] Just that we seem unable to *say* what this may be in a principled manner which reflects our thoughts about ways.

V

(iii) Lewis takes The Paraphrastic Argument to show that we are committed to possible worlds, because he takes modal beliefs to quantify over them. Yet were his argument successful, the most it could show is that there are entities which are ways the world might be. This is because it treats our modal beliefs as quantifying over possible worlds *only insofar as they are entities which are ways the world could possibly be*. Nothing in the argument suggest that we should treat our modal

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[279] On this point see Lowe 1995, 511-13.
[280] For this distinction see ibid., 511.

discourse as quantifying over worlds, that is, spatio-temporal systems. (4) merely re-*labels* the entity which is the way a world might be, it doesn't introduce a *new* kind of entity with which to identify it. As Loux put it, 'possible worlds' in Lewis's mouth is "the philosopher's name for the different ways things might have been".[281]

But this interpretation of Lewis's argument is puzzling for two reasons. The first reason is that Lewis takes ways to stand in need of identification with a kind of entity for which criterion of identity can be supplied, so that the 'apparatus of numerical quantification' can be deployed to specify the content of modal claims. If 'possible world' is *ultimately* defined in terms of ways worlds could be – and not in terms of some entity with which these ways are identified – then this cannot be done, for independently of being identified with some entity, ways worlds could be appear not to have a criterion of identity.

Second, Lewis wants the entities that modal claims quantify over to be used in a reduction of modality. But if those ways are specified as ways the world could be, they appear unsuitable candidates in terms of which to reduce modality. For if the content of modal discourse is characterised in terms of ways the world *could* be, and the source of modal truth is explained in these terms, then no reduction is achieved. It is clear from the *context* of the argument that Lewis takes it to show that *worlds* exist and so it is clear that Lewis takes it that the *content* of modal belief is quantification over *worlds*. It appears that Lewis's interpretation of his argument goes beyond what the argument seems to show. Expanding on this last point, the *context* of the argument treats 'possible world' as meaning an entity of the same kind as the world we live in.[282] Lewis is clear that the point of The Paraphrastic Argument is to dislodge the "common suspicion of possible worlds" and to show that "there are possible worlds other than the one we happen to inhabit".[283] Note that the suspicion concerns the existence of more *worlds* like our own – for there is little suspicion of *ways* the world might be, the only question is what they are. In the pages following the Paraphrastic Argument in *Counterfactuals*, Lewis emphasises his treatment of

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[281] Loux 1979, 30.

[282] Lewis 1973, 85-90.

[283] Ibid., 84. Note, it is only possible worlds in Lewis's sense of 'worlds of the same kind as our own' that were, in 1973, taken by Lewis's peers to be suspicious, while the possible worlds framework was used widely used and accepted (as Lewis points out in his 1986, 3).

possible worlds as worlds, by distinguishing between a *genuine* possible world – a universe like our own – and a *so-called* possible world, which is an ersatz object, a *representation* of a universe.[284] The Paraphrastic Argument can be understood as a defensive operation to show that we are committed to *genuine* possible worlds by our modal discourse, and to resist the "common suspicion" of these entities. It does so by arguing that we cannot consistently deny there are other worlds while affirming modal claims, because our modal claims are committed to these worlds. If such worlds are problematic entities, then the argument is meant to show that this is a problem for *all of us*, not just Lewis.

The Paraphrastic Argument is ordinarily read as trying – and failing – to establish that our modal discourse brings with it commitment to *worlds*. The trouble with the argument is that, on this strong interpretation, encouraged by the context of the argument, it is invalid – for at no point in the argument is warrant provided for identifying ways worlds could be with *worlds*, and so no conclusion about worlds can be drawn. Indeed, such a conclusion would go way beyond the modest ordinary language status claimed for the argument. But on a weaker interpretation in which 'possible worlds' are take to be entities that are ways worlds could be, it doesn't go far enough. For nothing has been said about what these objects are – they may be irreducibly modal entities, or set-theoretic entities or something else. It seems to me that Lewis encourages us to splice the weaker argument and stronger conclusion together, so that it seems that the innocent ordinary language argument has an extraordinary conclusion. This is really just an equivocation on 'possible world', and it is this which makes it *seem* that the innocent ordinary language argument supports the view that modal belief is about non-actual worlds.

In sum, the context of The Paraphrastic Argument, understood as an argument about content, leads us to read it as the argument that the content of modal beliefs are about *worlds*. Yet the argument doesn't appear to sustain the stronger reading that Lewis encourages. And on the weaker reading, it doesn't seem to support his analysis. So on neither reading can we say that the argument supports Lewis's analysis of modality as quantification over worlds.

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[284] Lewis 1973, 85.

4.25 The Theoretical Identification Argument

The thought behind the last two arguments (§4.21 and §4.23) has been that the *translatability* of modal claims by non-modal claims quantifying over worlds – either with or without explicit rules – supports Lewis's analysis of modality as quantification over worlds. The Theoretical Identification Argument also aims to the support Lewis's analysis, but instead of starting with what we *say*, appears to start with *ontology*, specifically the identification of possibilities and worlds; and this identity is used to ground the conceptual analysis. I will focus my attention in the following section on the grounds for this theoretical identification.

I will read Lewis's argument for the identification of possibilities with worlds via his well-known theory of mind. Specifically, I take the reasoning by which he justifies psycho-physical identification to be of the same pattern as that which justifies identifying possibilities and worlds. The reasoning is as follows: for a given concept there is an implicitly known 'Folk Theory' which defines it. The theory gives us a description, à la Russell, of the thing which as a matter of fact fits the description. Thus it is a 'conceptual' truth that pain causes avoidance, for that is an axiom of the implicit theory of mind. It is an empirical fact, let's pretend, that in humans C-fibre firing fits the description. Can a similar story be told, *mutatis mutandis* about the implicit 'Folk Theory' of modality?[285]

Lewis does not make explicit The Theoretical Identification Argument I attribute to him, but it can be read between the lines, particularly in *OPW*:

> What actually is the case, as we say, is what goes on here. That is one possible way for a world to be. *Other worlds are other*, *that is unactualised*, *possibilities*. If there are many worlds, and every way that a world could

possibly be is a way that some world is, then…modality turns into quantification.[286]

We can formulate The Theoretical Identification Argument more precisely as follows:

> (A) Possibly *p* iff there is a possibility at which *p* (analytic truth)
> (B) Possibilities are worlds (theoretical identification)
> So (C) Possibly *p* iff there is a world at which *p* (by substitution)

I take the following line of reasoning to be a plausible way for Lewis to use The Theoretical Identification Argument to support his analysis of modality: 'The justification for analysing modal claims in terms of quantification over worlds is that given both that possibilities *just are* worlds, and that modal claims quantify over possibilities, then modal claims are quantifications over worlds.' We can think of this argument as a re-formulation of The Paraphrastic Argument, which rather than *label* as 'possible worlds' the entities it treats as possibilities, *identifies* possibilities with worlds. The argument reverses the expected order of identity claim and analysis. For it might ordinarily be thought that the success of Lewis's analysis of modality is a *reason* to think that possibilities are worlds, whereas this argument uses the identity in support of the analysis.

4.26 Clarification and critique

I

The question I focus on in this section is: what is the *argument* for the identification of possibilities and worlds? We can approach this via the question: what are Lewis's *general* grounds for making theoretical identifications? He suggests two: first, theoretical identifications are theoretically *fruitful*, and second, they are *entailed* by other propositions we believe.[287] It is the second ground that Lewis, eventually, takes to be the decisive one. He writes that

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[286] Lewis 1986, 5.
[287] Lewis 1999, 248.

theoretical identifications are *not* voluntary posits, made in the name of parsimony; they are *deductive* inferences.[288]

And that

theoretical identifications *in general* are implied by the theories that make them possible – not posited independently.[289]

If theoretical identifications are conclusions of arguments, what argument has the identification of possibilities with worlds as its conclusion?

Theoretical identifications, as Lewis understands them, are, in the most interesting cases, points of contact between two theories. In the two cases below, the first premise of each is drawn from our 'Folk Theory', and the second premise drawn from 'scientific' theory. I begin with a familiar example, Lewis's psycho-physical identification argument:

[i] Mental state M = the occupant of causal role R (by definition of M).

[ii] Neural state N = the occupant of causal role R (by physiology).

∴ [iii] Mental state M = neural state N (by transitivity of =).[290]

Lewis's possibility-world identification can be formulated similarly, as follows:

(1) Possibility a = the occupant of metaphysical role R (by definition of a).

(2) World w = the occupant of metaphysical role R (by metaphysics).

∴ (3) Possibility a = world w (by the transitivity of =).[291]

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[288] Ibid., 257, my italics.

[289] Ibid., 249.

[290] Ibid., 248-49. The following example is also familiar: (i) Water is the occupant of the causal role R (by definition), (ii) H_2O is the occupant of the causal role R (by the discovery of chemistry), so (iii) Water is H_2O (by the transitivity of identity).

[291] Note that possibilities are idealised in this argument as complete or fully determinate.

I now elaborate the premises of this style of argument for theoretical identities, focusing on the second possibility-world identification.

II

The first premise in an argument for a theoretical identity – of the form '*t=the F*' – is an identity statement, which is thought to be grounded in the meaning of the singular term *t* and so, if true, is analytic *a priori*. Lewis takes *t* to be implicitly defined by the definite description '*the F*'.[292] This definite description is gleaned from the role *t* plays in our 'Folk Theory', and is for Lewis ultimately to be understood à la Russell.[293] The truth of the first premise of such arguments depends not on how the world is, but on the relations between expressions in our theory of it.

Lewis has a general theory of the meaning of theoretical terms, according to which any non-logical theoretical term *t* abbreviates a definite description which expresses the role of *t* in the theory in which the term occurs. More precisely, this 'role of *t*' is what the theory takes the object the term denotes to *do* in the world. If, for instance, *t*=particles, and the theory is physics, then according to physics having mass is one of the various facets of particle *behaviour* or *function*, according to that theory. Non-logical terms are not defined by what the object *t* denotes *is*, but what it *does*, or more precisely, what it is *taken* to do in the theory in which '*t*' occurs.

Lewis thinks our 'Folk Theory' contains modal expressions, expressed in English by words such as 'could', 'must', 'necessity' etc. Such expressions are identified as non-logical terms of 'Folk Theory', and so, according to his view about their meaning, are definable by their role in it, as specified by definite descriptions. So for instance, in the schematic premise (1), 'Possibility *a*' abbreviates 'the occupant of metaphysical role R' which is taken to express the role 'Possibility *a*' plays in the theory. If 'the occupant of metaphysical role R' denotes some entity, and if 'Possibility *a*' abbreviates that definite description, then necessarily the two terms denote the same entity.

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[292] Lewis 1999, 251-52, 255.
[293] See 1983, 78-95 and 1999, 248-61.

Finally, a note about the expression 'metaphysical role R', which appears in premise (1) and (2). In premise [i] of his argument for psycho-physical identity, Lewis says that what we mean by 'mental state M' is that thing which plays a specified *causal* role. 'Mental state M' is taken to have a functional definition, in which its function is specified by its causal role in terms of its relevant causes and effects.[294] With respect to the possibilities-worlds identification, possibilities are not taken to be identified with occupants of *causal* roles, but rather occupants of *metaphysical* roles, which are not reducible to causal roles. Nolan sees the need for some theoretical terms to be understood in terms of objects which play non-causal roles:

> In early applications, Lewis emphasised the construction of *causal* roles: roles specified largely in what the typical causes and effects of entities and states are. While that seems appropriate for some philosophical projects, it does not seem crucial to the method, and applications of the method to e.g. mathematical objects, or possibilities, or values, seems a feasible thing to try even if we doubt the roles taken from available theories will have much to do with what sets or possibilities or values *cause.*[295]

Lewis insists that there are objects which *do not* stand in causal relations, but *do* play non-causal theoretical roles, which define the meaning of terms in our theories. For instance, Lewis writes:

> Understand that I am *not* opposed to states of affairs, ways things might be, possibilities, propositions, or structures. I believe in all those things. That is to say, 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.[296]

It is because neither worlds nor sets stand in causal relations that none of the entities Lewis takes to be defined in terms of sets of worlds do either. For Lewis, each such

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[294] Compare with Armstrong: "the concept of a mental state is primarily the concept of a state of the person apt for bringing about a certain sort of behaviour [and secondarily also, in some cases] apt for being brought about by a certain sort of stimulus" (1968, 82).
[295] Nolan, forthcoming.
[296] Lewis 1986, 185. Also see ibid., 86 where Lewis suggests it is 'beneficial' to identify ways worlds could be with worlds (or at least it would be if it didn't trivialise Ways (see §3.3)).

entity is taken to play a theoretical role, each are named by terms in our theory, and so each are defined in terms of the *metaphysical* role they play in that theory. Lewis appears to think a natural way of specifying the role possibilities play in our 'Folk Theory' is as ways the world could possibly be.[297] Lewis is clear about the general methodology:

> 'Property', and the rest, are names associated in the first instance with roles in our thought. It is a firm commitment of common sense that there are some entities or other that play the roles and deserve the names, but our practical mastery of uses of the names does not prove that we have much notion what manner of entities those are.[298]

While, for Lewis, the meaning of terms in our theory are tied to role the theory takes the objects they denote to play, knowing this role doesn't itself tell us anything about the *kind* of object that plays it – it just narrows down the class of objects to a range which are *capable* of playing that role. The next stage of The Theoretical Identification Argument moves from carving out roles, to filling them with objects that play them.

The second premise of a theoretical identification argument states an identity claim which is *not* grounded solely in the meaning of the expressions constituting the statement of identity. Whereas the first premise is, if true, analytic and so necessarily true, the second premise is not analytically true and is, if true, ordinarily only contingently so.[299] The second premise claims that a type of object plays the non-defining role specified by a definite description. The premise can be thought of, roughly, as a postulate of scientific theory. For instance, 'H_2O' = the stuff that plays the watery role. 'The stuff that plays the watery role' does not *define* 'H_2O', which has a chemical definition, and so it is not *necessary* that H_2O played the watery role.

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[297] Lewis 1973, 84.
[298] Lewis 1986, 189. See also 184.
[299] However, the world identification is a special case note, because if worlds are the objects which play the role of being the way worlds could be (or whatever precisely the metaphysical role of possibilities is) then they non-contingently play that role.

The initial identity will hold contingently just in case H_2O turns out to *uniquely* play the watery role.[300]

Finally, the conclusion of a theoretical identity argument should follow from the two premises by the transitivity of identity. It is essential to the argument for a theoretical identity of the form '*t=the F*, *r=the F*; so *t=r*', that the definite description which is used to give the meaning of *t*, in the first premise, is the very same description used to specify the role of *r* in the second premise.[301] It is only if the role which gives meaning to *t* is the very same role which *r* uniquely plays, that *t=r*. Lewis, writing about psycho-physical identification, says

> Physiology [premise [i]] and the meanings of words [premise [ii]] would leave us no choice but to make the psychophysical identification [[iii]].[302]

The identity is not made by *choice*, due perhaps to its perceived fruitfulness to theorising; it is *compelled* by logic. If a mental term 'M' abbreviates a definite description '*the F*', and if '*the F*' is satisfied by a object which a neurological term 'N' denotes, then it necessarily follows that M = N. Thus theoretical identities are factored into two parts: an analytic part which is necessary, and an empirical part which is contingent.

III

Having elaborated the general argument for theoretical identification, I now turn – focusing on the possibility-world identification – to three of its problems. First, premise (1) presupposes the answer to delicate questions about the nature of our modal notions and the nature of possibility. By treating modal expressions (i) as referring terms, (ii) whose meaning is specified by a definite description understood

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[300] Whereas the first premise is, if true, analytic, the second premise, if true, is not. Suppose, for instance, that a physiological theory says that the object denoted by 'neural state *N*' is the very object which does such-and-such. Its truth is dependent on whether the world is as the theory says it is, and so it is non-analytic. Whether its truth is knowable *a posteriori* or *a priori* depends on the subject-matter of the theory in question. Physiology, for instance, deals in objects we know *a posteriori*. Metaphysics is generally understood to be an *a priori* discipline, and if so, premise (2) can be known *a priori*.

[301] Note that the two Ts in question – in the first and second premises – may well be distinct. For instance, the theory in which the salient term of the first premise occurs may be our 'Folk Theory', whereas the theory in which the salient term of the second premise occurs may be metaphysics or some other science.

[302] Lewis 1999, 249.

à la Russell, it is presupposed that whatever modal notions are, they are first-order quantifiers, and whatever possibilities are they are the kind of entity that can be quantified over by first-order quantifiers. This assumption corresponds to what I took to be an unjustified move in Lewis's Paraphrastic Argument, in which he treats quantification over ways things could be, as quantification over *entities* that are those ways (§§4.23-4.24). This move, in both cases, requires justification. In the current argument, the justification is based on a general account of the meaning of theoretical terms in terms of definite descriptions. Whether it is right to think of expressions drawn from ordinary discourse as *theoretical* terms I come to below.

Second, even if (1) were true, it is hard to see how we could know it to be so. For it relies on the assumptions that we can recognise that (a) our ordinary modal expressions are part of a theory, specifically 'Folk Theory' (b) which has a canonical form, such that (c) modal expressions are *terms* of the theory, which (d) abbreviate definition descriptions of the theory, such that (e) (1) is entailed by that theory.[303] Yet I take it that all of these claims are controversial, and much more needs to be said in defence of them, which Lewis doesn't appear to provide. In particular, even if we accept that our modal expressions are part of an implicit 'Folk Theory' how are we to determine which is the correct canonical form of it and whether in that canonical form (1) is entailed by it?[304]

This same epistemic problem also strikes at (2). For if (2) is thought to be entailed by a metaphysical theory, it will only be on certain *formulations* of that theory that (2) follows from it. So whether we have a reason for thinking (2) is correct will depend on what we take to be the correct canonical form of the theory which is supposed to entail it. Consider, for instance, that the question of what *the* role associated with H_2O in chemistry is, can be answered only given a particular formulation of chemistry. Providing this, however, seems less problematic than for providing the

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[303] See §5.4 for a related point, concerning whether a global axiomatisation of 'Folk Theory' is possible.

[304] One way of answering what the correct canonical theory is, is to appeal to intuitions about the correct use of modal expressions, another is to appeal to purely theoretical considerations. While appeal to intuitions may get us somewhere, we will in any case require a theory to determine which intuitions to take seriously, and which to disregard. Theoretical considerations include prioritising the *simplest* account or the one which *coheres* best with the rest of our beliefs. However, if we appeal to purely theoretical considerations there is no guarantee these will respect what our expressions actually mean. It may be that for the sake of systematicity, some distortion of what we mean is acceptable. If so, the judgement that (1) is true by definition in the canonical theory will ring hollow, and may appear to be a convenient stipulation for the sake of a better overall theory, but its connection to our original modal discourse will be weakened.

right form of the theory which entails (1), given that there is greater agreement as to what the correct form of statements of chemical theory are than 'Folk Theory'. Further, chemists may legitimately stipulate a meaning for novel terms that may figure in claims like (2), whereas the canonical theory that entails (1) is constrained by the meaning of our discourse which precedes theory.

The above epistemic problems arise because the premises of theoretical identification arguments are thought to be entailed by our theories, but that specifying the form those theories take on which the premises are entailed seems to be more troublesome that sometimes realised. This is particularly problematic with respect to premises in which ordinary English expressions are used, and it is assumed that there is a single definite description which defines it.[305] Until there is a reliable method by which to render canonical forms of our ordinary beliefs and our theories, resorting to specific canonical formulations of them will, it appears, only beg questions, not answer them (see §5.4, for connected problems). Nolan notes the importance of addressing this issue:

> One methodological purpose of this focus on roles and what realises them is to try to extract *definitions* that can provide analytic truths about the topics of interest….Using this method to extract plausible definitions is not entirely straightforward, however, especially once the issue of deciding which theory is canonical is taken seriously.[306]

Third, what kind of claim is (2) how can we know if it is true? (2) asserts that worlds play the possibility role, or more precisely, worlds are identical to the objects which play the same metaphysical role as the role possibilities play. Lewis justifies this claim on the grounds that the theory which postulates worlds as playing this role is the most *systematic* theory available.[307] The problem with this justification is threefold. First, Lewis wanted his Theoretical Identification Argument to show that

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[305] Papineau highlights a possible reason why we need to be cautious about tying the meaning of an expression to a particular theory: "Suppose that the concept of free will is a theoretically defined concept. If so, which theory defines this concept? It could be the theory that free actions are those which spring from the agent's motives. Or it could be the theory that free actions are those which spring from the agent's motives *and* are undetermined." And "When some term is theoretically defined, there will in principle be a choice about how much to pack into the defining theory" (2011, 79).
[306] Nolan, forthcoming.
[307] E.g., Lewis's 1973, 88 or his 1986, 135.

theoretical identities are not introduced just because they are parsimonious, but because they follow from analytic and scientific claims we do or should accept. But if the basis for accepting (2) is that it follows from the most parsimonious theory of modality, then parsimony re-enters the argument for theoretical identity. Second, while Lewis takes the theory which entails (2) to be *a priori,* if the reason he thinks we should accept that theory is because it performs better than rival theories – that worlds are the best candidates for the role than rival objects – then the basis for (2) is in part dependent on knowledge of which rival theories exist, which is an *a posteriori* matter. Third, whether the basis for (2) is *a posteriori* or not, it is not purely conceptual. For the view that there are worlds to identify with possibilities is not a conceptual claim, but a postulate of Modal Realism. But if this non-conceptual claim is part of the argument for Lewis's analysis – rather than the success of the analysis of modality being the basis for Modal Realism – then the grounds of the analysis will not be purely *a priori* conceptual claims as was required (in §4.0).

4.3 Arguments against the conceptual connection

I have found Lewis's arguments for his analysis of modality to be unsatisfactory. Each has been subject to objections which indicate that there is no *a priori* conceptual path connecting modal notions and quantification over worlds. Hence he appears to have given no arguments which do well with respect to the conceptual adequacy condition on theories of modality. I now turn to several reasons which strengthen this suggestion by focusing on the two other tests of conceptual adequacy: *understanding* and *ontological commitment.* I argue first (in §4.31) that it seems our understanding of modal concepts is not constituted by quantification over worlds. I then argue (in §4.32) that modal propositions are not committed to the existence of worlds, while propositions quantifying over worlds are. Together, these are two reasons to support the view that Lewis's analysis doesn't satisfy the conceptual adequacy condition.

4.31 Quantification and understanding

I

It would be expected that if Lewis's analysis of modality were correct, then our understanding of a claim quantifying over worlds would suffice for our understanding of the modal claim it is taken to analyse. In this section I investigate whether this holds. (A) I suggest that it is widely recognised that modal notions have a special intractable meaning. (B) I then argue that there are modal claims which make perfect sense, but which Lewis's theory can make no sense of; and conversely, there are senseless modal claims which Lewis's theory makes perfect sense of. Finally, in (C) I suggest that it is implausible to suppose that Lewis's theory of modality is, as he suggests, our implicit theory of modality.

II

(A) There is a widespread recognition, perhaps especially from *within* the empiricist tradition that modal concepts are problematic; in particular those modal notions which seem to bring with them commitment to mere *possibilia*. As Quine despairingly asked about merely possible objects,

> what sense can be found in talking of entities which cannot meaningfully be said to be identical with themselves and distinct from one another? These elements are well-nigh incorrigible.[308]

The putative absence of a criterion of identity for objects which could exist but do not, leads Quine to the view that the very idea of such entities is incoherent.[309] This

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[308] Quine 1961, 4.
[309] Contrast Lewis's approach which is to reduce possibilities to entities for which a criterion of identity *is* available.

means modal discourse is incoherent, at least to the extent that modal expressions such as 'must' and 'could' behave as quantifiers over such possible objects.

Quine takes expressions such as 'could' to supposedly invoke an immense range of possible objects. For instance, consider all the trees that there are in the universe – there is a finite number of them, probably all rooted in our planet. Now consider all the trees there *could* be – there is an infinite number of them, only the actual ones being rooted in our planet. Quine refers to this power of 'could' to purport to invoke a plethora of possible objects, as the "*vast supplementary force* of 'could'" which he casts as a "vestige of Indo-European myth, fossilized in the subjunctive mood."[310] Of course he rejects that 'could' and other modal notions really have the force they appear to. For Quine holds that while such notions purport to quantify over mere *possibilia*, it turns out that we have no criterion of identity for such objects, and so quantification over *possibilia* cannot have its apparent sense. Instead Quine suggests that a sense can be given to modal notions as follows:

> Our basis for saying what 'could' be generally consists, I suggest, in what *is* plus *simplicity* of the laws whereby we describe and extrapolate what is. I see no more objective way of construing the *conditio irrealis*.[311]

This is an attempt to reconcile modality and empiricism, by taking modality to be a matter of regularity. This domesticated modality is meant to exclude possible bald men in doorways and such like from our ontology, unless they already figure in what is, or can be explained in terms of 'extrapolations' by simple laws from what is. But this is clearly to stipulate a meaning for some modal notions, consonant with Quine's empiricism; not to give a general conceptual analysis of our modal notions.

I want to stress that Quine's objection to modal notions – not his replacement for them, but the original notions – expresses the recognition (a) that they have a special sense and (b) that we use them for a special purpose. He rejects modal notions as incoherent because he doesn't think that an account can be given of their special

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[310] Quine 1961, 54, my italics.
[311] Ibid., 54. Compare Fine: "in so far as [empiricists] have been able to make sense of modality, have tended to see it as a form of regularity" (2005, 1).

sense. Such an account would have to treat modal notions as referring to *possibilia*, and so would require that criterion of identity can be supplied for such entities. Our understanding of the meaning of modal expressions would require *grasp* of this criterion of identity. Without us being able to supply such a criterion, the special sense associated with modal expressions – their 'vast supplementary force' – must be an illusion, and our use of them to express this sense must be misplaced.

Quine wasn't alone in thinking modal notions appear to make special demands on the world that outstrip what there is. Wittgenstein wrote that

> A wish seems already to know what will or would satisfy it; a proposition, a thought, what makes it true—even when that thing is not there at all! Whence this *determining* of what is not yet there? This despotic demand? ("The hardness of the logical must.")[312]

Like Quine, Wittgenstein takes modal notions to be connected to non-existent objects. Wittgenstein's view that necessity legislates over even that which is not yet there well captures our sense of the *compulsion* or "despotic demand" of necessity; just as Quine's view that 'could' has a "vast supplementary force" captures our sense of the *openness* of possibility.[313] Whether or not, as Quine thought, modal notions are ultimately illusions, because we cannot make sense of what they purport to represent, the important point here is that they *do* purport to represent something which both Quine and Wittgenstein's metaphors aim to express. On their understanding of modal notions, they cannot be reduced simply to what exists. For nothing that exists accounts for the "supplementary force" or "despotic demand" which modal notions supply, and for which quantification over *possibilia* is invoked.

III

(B) Lewis's project of rehabilitating modal notions in a Quinean framework requires him to recover the "vast supplementary force of 'could'" by finding objects for which we have criteria of identity to identify possibilities with, such that 'could' can

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[312] Wittgenstein 1953, §437.
[313] More recently Sider has described modal notions as "point[ing] beyond themselves" (2003, 193).

after all be understood as quantification over these entities. This is an attempt to meet Quine's demand that modal notions be "explained in non-modal terms".[314] The vast force of modal notions is cashed out in terms of the vastness of the domain of quantification. As Fine put it,

> if there is not enough going on in the actual world to sustain the possibilities that we take there to be, then one strategy for the empiricist is to extend the arena upon which the possibilities are realized to include what goes on in each possible world.[315]

The disagreement between Lewis and Quine is both semantic and ontological. Quine took the range of unrestricted 'everything' to reach to merely the ends of our own world; Lewis takes it to reach the edge of the pluriverse.[316] By identifying possibilities with worlds Lewis takes himself to have provided the resources to answer Quine's charge that *possibilia* are illegitimate because they have no criterion of identity. While agreeing with Quine about what it would take for modal claims to make clear sense – that they must be formulable in a non-modal first-order language – Lewis disagrees that this cannot be achieved. By identifying possibilities and worlds, and then increasing the number and diversity of worlds postulated, Lewis hopes that modal notions can be rehabilitated in a non-modal first-order language.

However, it appears that understanding existence claims about worlds is insufficient for understanding modal claims. If this is so, it would appear to undermine Lewis's analysis, and so his project of rehabilitating modality. I provide three examples to illustrate this point, which concern the *sense* not the *truth-value* of modal claims. The first example is the following Euthyphronic Dilemma:

> is *p* necessary because *p* is true in all worlds or is *p* true in all worlds because *p* is necessary?

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[314] Quine 1947, 43.
[315] Fine 2005, 1.
[316] As I suggested in Chapter 3, the power that Lewis finds in the *range* of worlds *really* comes from an irreducibly *modal* notion (§3.3 and §3.51).

This grounding question appears fairly clear, even if the precise grounding relation we are getting at may not be. Yet Lewis's analysis trivialises the question. For it is equivalent, on his interpretation, to the question

> is p true in all worlds because p is true in all worlds or is p true in all worlds because p is true in all worlds?

The original question has the form: 'is p because q or q because p?' Lewis's interpretation of it has the form: 'is p because p or is p because p?' And so it has the form: 'is p because p?' Not only is Lewis's interpretation incapable of capturing the genuinely disjunctive form of the original question, but it also trivialises it, and so fails to capture the sense of it. Our understanding of the original question cannot then run via our understanding of the worldly question. And any similar propositions which differentiate possibility or necessity from truth in a world face the same trivialisation. It is because Lewis's analysis identifies worlds and possibilities, propositions whose sense depends on their non-identity – or which raise the question of their non-identity – cannot be understood.[317] Given that we understand the Euthyphronic Dilemma to be non-trivial, the analyses Lewis offers of them cannot provide for our understanding of these claims.[318]

The second example is as follows. Suppose you know that a proposition p is (absolutely) necessary. From this knowledge of p's necessity, you can infer that whatever else may be the case, p.[319] Now suppose instead that that you know that a proposition p is true in all worlds. You cannot, with this knowledge alone, infer that whatever else may be the case, p. Our understanding of claims quantifying over worlds does not then suffice for understanding modal claims, for we can make

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[317] Another instance of this was the trivialising of Ways by Lewis's analysis, which renders 'every way that a world could possibly be is a way that some world is' as 'every world is identical to some world' (see §3.2 and §3.3).

[318] Such a result is common to analyses which tie together concepts normally regarded as distinct. Such analyses *close down* our conceptual space, so we cannot ask certain questions that previously made sense. Rayo, who has developed a sophisticated view of 'just is' statements, considers the closing of conceptual space a cost to a theory, which must be weighed against its benefits, which of course depends on what the theory is trying to achieve (Rayo 2013). Lewis is explicitly trying to give a conceptual analysis of modal *content* which makes our implicit understanding of modality explicit (see §4.1). As such, if we can understand modal claims but whose quantificational analogues do not suffice for understanding of it, this appears to be a serious problem. (Interestingly see Rayo 2008, for the view that a metaphysical analysis of modality cannot serve as an account of content.)

[319] McFetridge 1990, 135-154.

inferences from modal claims which we cannot make from claims quantifying over worlds.

I take the explanation for this difference of inferential power to be as follows. Nothing in the supposition that *p* holds in all *worlds* rules out that there may be a possibility – a *possible* world – at which *p* doesn't hold. In which case it is not true that whatever else may be the case, *p*. It is only by confusing truth in all *possible* worlds with truth in all *worlds*, that we take truth in all worlds to imply that whatever else may be the case, *p* (see §4.24). For while truth in all *possible* worlds is logically equivalent to necessary truth, truth in all *worlds* is not. There is no contradiction involved in saying that *p* is true in every world, but not necessary. At least, not unless we have the additional belief that the domain of worlds is equivalent to that of *possible* worlds. That is to say, not unless the domain of worlds includes e*very world there could be*, and nothing else. In order then to close the gap between *p* holding in all worlds, and *p* holding in all possible worlds, we must think that the worlds just *are* the possible worlds. Thus, for the understanding of quantification over worlds to suffice for the understanding modal claims, it must be accompanied by a theory of worlds according to which, every world that could exist, does exist.[320] And such a theory is not the reductionist one Lewis aims to provide.

The third example suggests that the propositions Lewis takes to constitute our understanding of modal claims (a) appear to say something different from the original claim and (b) seem either false or absurd, whereas the original claim seems true. Consider the question: 'Are there worlds bigger than the actual world?' This seems to make sense, but its modal analogue is: 'Are there *possibilities* bigger than the actual world?' which I take to make little sense.[321]

What underlies this difference of sense seems to be that we think of worlds and possibilities as having different properties (see §4.24 for a similar point). Consider

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[320] Lewis's principles of plenitude are attempts to say just that. I argued in Chapter Three that these principles bring with them irreducible modality, and so quantification over worlds can only suffice for understanding modal claims by presupposing modal notions in the first place.
[321] The previously quoted point of Van Inwagen's is again relevant here: "How could one suppose that the (unrealised) possibility that the universe be thus-and-so is a thing that has a mass of 3.4×10^{57} grams and is rapidly expanding?" (1986, 199). Note that the 'thus and so' must be a fully specific property of the universe or else the possibility will, on Lewis's view, be a *set* of worlds, and the criticism, at least in its current form, will not work.

the question: 'Is there a coloured world?' which appears to make sense, but its modal analogue is 'Is there a coloured possibility?' which appears not to make sense, for while possibilities may be possibilities of colour, it is hard to make sense of coloured possibilities. The same point can be multiplied to cover a large range of properties which seem to hold of worlds and their parts but which don't seem to hold of possibilities or ways things could be. It seems then that one of two consequences follows: either we must deny that our understanding of possibilities is constituted by our understanding of claims quantifying over worlds, and so do justice to the thought that we cannot make sense of the examples above; or, if we embrace Lewis's view of what constitutes our understanding of modality, we must accept that we can, despite evidence to the contrary, make sense of such examples.

The first view, which I take to be Lewis's, is revisionary of our modal beliefs, for according to it, it makes sense to say – indeed it is a fact – that possibilities have sizes, masses, parts etc.! Such a view seems, in part, to be a consequence of acquiescing in Quine's demand for a criterion of identity for possible objects, in Lewis's nominalist metaphysical framework.

IV

(C) It is a common criticism of Lewis's theory that it leads to an implausible modal epistemology, for it is a mystery how we can learn about what goes on in non-actual worlds, given we are, on his theory, causally isolated from them.[322] A related, but less commonly made point, is that Lewis's theory cannot be a description of the theory we all implicitly believe, because his theory is unknown to ordinary people.[323] If it is unknown to ordinary people, it cannot express our actual understanding of modal claims. Rosen writes in support of this criticism that according to Lewis

> we are committed to modal realism from the cradle, simply because we reason about what might have been. It seems clear, however, that with one or two exceptions, modal realists are made, not born.[324]

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[322] See e.g. Stalnaker 2003, 40 and Lewis 1986, 108-14.
[323] For a similar point, see Block and Stalnaker 1999, 30.
[324] Rosen 1990 340, fn.20.

Lewis takes his analysis to express the theory we implicitly believe, and which gives modal expressions their meaning. He presents this theory in a systematic and improved form, but it is, he thinks, *our* theory.[325] So, in a sense, we unwittingly knew the content of Lewis's book before we read it, before he wrote it; in fact understanding his book was really a matter of recall, for we *already* knew what it said.[326] It is perhaps the principle of charity together with a conservative approach to systematising our beliefs which is responsible for the view that we are all implicit modal realists. On this approach it is preferable to say that we misunderstood our modal beliefs – re-interpreting their content so as to maximise their truth – than it is to affirm that we do understand the content of our modal beliefs, but that they are false.

A reason to refuse Lewis's view is that it opens up a gap between what we take ourselves to understand by our modal claims, and what his theory takes our understanding to consist in. Other than seeming implausible, this view requires revisionary approach to what we might call 'meta-modal' beliefs, beliefs about the content of our modal beliefs. This includes revising our view of the content of beliefs and other propositional attitudes which take modal propositions as their objects. I return to this point at the end of the following section.

4.32 Ontological commitments and modal concepts

I

Lewis faces a dilemma: he can affirm his analysis of modality as a *description* of the content of our modal beliefs, and so hold that our ordinary modal beliefs are ontologically committed to worlds; or he can hold that ordinary beliefs are not committed to worlds, but that the analysis *should* be affirmed, not as a description of, but as an *improvement* on, our modal beliefs. While Lewis is torn on the question of whether his theory is descriptive or normative,[327] there is good evidence that he takes

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[325] Lewis 1986, 134.
[326] Note that like The Paraphrastic Argument, this point makes us accomplices in any guilt which belief in Lewis's theory brings. Rhetorically, this serves to curb certain critiques of his theory.
[327] Lewis 1986, 134.

it primarily to describe our modal beliefs, and express our ordinary understanding of them (see §4.1). As such it then seems he must take our ordinary modal beliefs to incur commitment to worlds.

In the last section I suggested that Lewis's conceptual analysis is not correct, in part because we cannot make the same *inferences* from his quantificational claims as from their associated modal claims. I now argue (a) that his conceptual analysis seems incorrect because his analysans has different *ontological commitments* from those of the analysandum. For modal and quantificational concepts cannot be the same if they issue in propositions which have different ontological commitments. And (b) that the interpretation of modal claims as ontologically committed to worlds requires large scale revision of our beliefs about the content of our modal beliefs, concerns, desires etc. The extent of this revision indicates that the analysis is not *merely* making our implicit modal theory explicit.

I proceed in this section by suggesting there is a tension between the *function* of some modal claims and the view they are ontologically committing. I take this tension to indicate that modal claims don't quantify over worlds. Then I suggest that Lewis takes the view that modal claims *are* ontologically committing, and that his view is more revisionary than often recognised. Finally I suggest he would do better by treating his theory of modality as a purely metaphysical theory, and abandoning his aspirations for giving a descriptive analysis of our modal concepts.

II

It is uncontroversial that we do not ordinarily believe that merely possible objects exist. We may be *forced* to by argument to do so, but we need force to get us there. For instance, we may reason that if it is true that *x* possibly exists, then there must be something which exists in virtue of which it is true. But force can sometimes ride roughshod over delicate concepts, distorting them as it makes way for a powerful theory. Our *ordinary* notion of merely possible objects seems to be of objects which, like fictional objects, do not exist.[328] In other words, our ordinary concept of

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[328] Why do we not mourn the dead of merely possible wars? It is because they don't exist, not because, e.g., we do not know them well enough.

possibility appears to be ontologically *neutral*: it doesn't follow from any statement asserting a mere possibility, that there exists something which *is* that possibility. So if possibility is to be analysed in a way which conforms to what I take to be ordinary belief, then it shouldn't be analysed in terms of existence. Quine takes an even stronger view: that the concept of possibility *cannot* be ontologically committing because to be so it would require possibilities as suitable values of first-order variables, yet they are unsuitable.[329] I however just want to point out that we appear to *take* our ordinary concept of possibility to be ontologically neutral. Morton well captures the surprise we find on being told by some modal theorists that we are ordinarily committed to *possibilia*:

> Most of us do not believe that there are *possibilia*. We do not believe that 'I could have been the father of six children' is true by virtue of my or anyone else's paternity of six possible, nonactual, children. It would therefore be disturbing to be told that when one uses such idioms one is referring to *possibilia*, even though one doubts that there are any.[330]

One function of assertions of possibility helps to bring out this neutrality. Assertions of possibility can be as a device to *withdraw* ontological commitment. To illustrate, take any declarative sentence *s*. Now prefix a non-epistemic possibility operator to it, so we have the sentence 'Possibly *s*'. 'Possibly *s*' we would expect is committed to no *additional* entities than *s* is committed to. If anything, in asserting 'Possibly *s*', the existential commitments that would ordinarily arise from the assertion of *s* are withdrawn.[331] For instance, compare 'There are unicorns' with '*Possibly* there are unicorns'. The former sentence is committed to unicorns; the latter is not. The latter issues in, we could say, a *possible* or *conditional* commitment, that is, a commitment to unicorns *were the possibility of unicorns realised or actual*, but a possible commitment is different from an actual commitment to a possibility. Being able to assert possible existence without asserting existence seems precisely the point of many possibility claims. The limit case of the possibility of nothing brings this out (see §3.52). For this possibility to be coherent it is required that our concept of

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[329] See, e.g., Quine 1961, 4.
[330] Morton 1973, 394.
[331] I say 'if anything', because in context, it may be common knowledge that some entities which *s* is about, exist. In qualifying '*s*' with 'possibly' we don't withdraw our commitment to *their* existence.

possibility is not existentially committing, for otherwise in saying there might have been nothing, we are committed to there being something which is that possibility. An ontologically neutral notion of possibility leaves room for making sense of such claims.

The view that ordinary modal claims are ontologically has its adherents. Williamson, for instance, clearly articulates it:

> take claims of possibility. If we try to put them in first-order terms, we may have to go to a first-order language in which we quantify over possible worlds. Then we'll understand claims of possibility as claiming, amongst other things, that there is a possible world of a certain kind. But that is not a commitment of the original claim, which is in good standing before it's regimented, and the regimentation may be unfaithful to what the philosopher is putting forward.[332]

He elaborates on this point elsewhere:

> The modal realist's postulation of an implicit argument place for worlds is not faithful to our understanding of modal vocabulary.[333]

By contrast, for Lewis, modal propositions *just are* quantifications over worlds. There is no gap between the two claims. Hence our intuitions about the content of modal beliefs, according to which they do not incur commitment to entities which *are* possibilities, are wrong. For Lewis, the concept of possibility *cannot* be used to withdraw our commitments to things. For any true assertion of possibility brings with it a commitment to a world. You cannot use 'possible' to withdraw a commitment without making a new one. For instance, take the sentences 'There are unicorns' and 'Possibly, there are unicorns'. Suppose you deny the former and assert the latter. You thereby deny there are any unicorns in the actual world, but assert there is a world in which there are unicorns.[334] That modal concepts are *not* ontologically neutral is the explicit basis of Lewis's theory of modality. He writes

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[332] Williamson in Antonsen 2012, 25.
[333] Williamson 2002, 240. For a connected but more general point, see Yablo 2008, 192.
[334] Merely possible *de re* modal claims are, on Lewis's view, doubly committing: to the world of utterance in which *x* exists, and at least one other world in which a counterpart of *x* exists.

that his analysis of modality "presupposes" Modal Realism[335] and is "Modal Realism 'at work'".[336] Such ontological non-neutrality is natural in a theory in which modal concepts are defined in terms of the existence of a realm of worlds.[337]

III

I mentioned above a dilemma Lewis appears to face: either he can affirm his analysis of modality as a *description* of the content of our modal beliefs, and so hold that our ordinary modal beliefs are ontologically committed to worlds; or he can hold that ordinary beliefs are not committed to worlds, but that the analysis *should* be affirmed, not as a description of, but as an *improvement* on, our modal beliefs.

Accepting the first horn of the dilemma means that our modal discourse commits us to the existence of other worlds. This approach is however more revisionary than usually recognised. It not only requires revision of our modal beliefs (see §3.52), and cannot makes sense of using modal claims to withdraw ontological commitments, but also it seems to require revision of our meta-modal beliefs about the content of propositional attitude ascriptions involving modal content. Take for instance the case of Hubert Humphrey.[338] He cares about whether he could have won the election, but doesn't care about whether his counterpart won a counterpart election in another world. This lack of concern about his counterpart is thought to manifest the belief that Humphrey's counterpart is *irrelevant* to his possibly winning the election. For Lewis, the fact that Humphrey possibly won is constituted by his counterpart's winning. This mean Lewis can then *either* say that Humphrey *does* care about his counterpart winning (but not under that description) and is just wrong that his counterpart's doings are irrelevant to what he (Humphrey) believes – or else he must say that though Humphrey *doesn't* care, he rationally *should* care.[339]

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[335] Lewis 1986, vii.
[336] Ibid., 5.
[337] This is most clearly seen in the limit case of the possibility of nothing, which Lewis is forced to deny. Thinking of a central feature of Lewis's theory as ontological non-neutrality with respect to modal claims can help us see the real force of the infamous 'incredulous stare' objection. It is not, as Lewis reads it, an unwillingness or inability to countenance an ontology of worlds, but rather an unwillingness or inability to comprehend that a theory could take what appears to be ontologically neutral discourse – which at times is employed precisely to *avoid* ontological commitment – to be ontologically committing discourse, whose content is to be interpreted as quantificational.
[338] Kripke 1980, 45 fn.13.
[339] For discussion see McFetridge 1990, 142-4, Hale 1986, 77-78, Rosen 1990, 349-51 and Hughes 2004, 127-131. For a connected point, see Williamson 2000, 31.

On the horn of the dilemma I believe Lewis must take, he is committed to saying that Humphrey *does* in fact care whether his counterpart wins – which is contrary, I am supposing, to Humphrey's own reflective judgment about himself, and what he takes himself to mean. This is the kind of revision that Lewis is committed to whenever ordinary views about the content of our modal beliefs run up against the verdicts of his conceptual analysis. He requires large scale revision of our view of ourselves, of our beliefs about the content of our beliefs, desires, concerns etc., whenever they take modal propositions as their objects. Revision of such meta-modal beliefs stand in the way of a smooth and costless treatment of modality as quantification over worlds.[340]

The point can be compared to an ethical theorist who takes our basic moral concepts to be those described by utilitarianism. Such a theory comes up against what I take to be the jumble of values which constitute our ordinary ethical life, which cannot be squeezed into his monistic theory. Such a theorist must not only revise many first-order *ethical* beliefs, but will also appear to require revision of meta-ethical beliefs about the content of propositional attitudes involving ethical belief. So, for instance, if the theory states that what we mean by 'good' is pleasure, then I must revise my understanding of beliefs such as my wanting to do good in the world, which I do not take to be concerned with the generation of pleasure. Indeed, as Moore pointed out, it is easy to determine that *that* is not what I ordinarily mean by 'good':

> whoever will attentively consider with himself what is actually before his mind when he asks the question 'Is pleasure (or whatever it may be) after all good?' can easily satisfy himself that he is not merely wondering whether pleasure is pleasant.[341]

If the good is identified with pleasure and moral claims are analysed in terms of pleasure, then an error theory of *the content* of moral claims is being proposed: our ordinary *picture* of our moral discourse is, according to the theory, in error.

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[340] See Rosen 1990 349-51, for support for the view that Lewis's view here is very revisionary.
[341] Moore 1986, 16.

Likewise, Lewis appears to be committed to the revision of very many beliefs we have about ourselves. On his view, in very many cases we do not know ourselves, in the sense that we do not know the content of our modal beliefs, desire and other propositional attitudes. He might go along with Wittgenstein's remark that when we mean something

> one is oneself in motion. One is rushing ahead and so cannot also observe oneself rushing ahead.[342]

Lewis appears to think we need *theory* to tell us about what it is we believe when it comes to our modal beliefs, and presumably many others; we do not have some direct or intuitive access to their content, which may constrain our theory of what they are about. Though Lewis's revisionary stance raises problems for the material adequacy of his theory, it isn't *simply* a problem of material adequacy. The theory entails a picture of ourselves that strikes us as absurd, in which we are alienated from our own modal beliefs. For Lewis, and to put things in terms he would reject, what is in our minds when we affirm necessity is something we cannot directly recognise. He hopes that by re-interpreting the content of modal beliefs he can preserve their truth-value, in his framework, and so not have to revise them. That may be so, but there is still a cost to re-interpreting this content so radically, which is that a large class of meta-modal beliefs about the content of modal beliefs are false or must themselves be re-interpreted.

IV

Whatever virtues Lewis's theory of modality might have: unified, reductive etc., if it isn't *ours* – in our heads, grasped by us – then it cannot be the theory by means of which we actually understand modal concepts. Lewis appears to find the theory of modality that suits his theoretical requirements, and projects it back as the theory we use. But there is little evidence to think that his theory is *our* theory (see §4.31). Why not instead give up on the view that the analysis of modality is a conceptual analysis, as we have so far been supposing. Lewis could distinguish between the analytic and

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[342] Wittgenstein 1953, §456.

explanatory ambitions for his theory, and set aside the former, at least insofar as the analytic ambitions rest on conceptual analysis. This would then open up the possibility of thinking of his theory of modality as a theory of the *source* of modal truth, and so as a theory which it is plausible to say we *should* believe rather than the theory we *do* implicitly believe, and in this way accept the revisionary nature of the theory (as revising our beliefs about reality, not about the content of our thoughts).[343] This would be a more plausible view, and allow Lewis to explain the *truth* of modal claims in terms of worlds, while leaving open the question of what our modal concepts really are. Having given up the conceptual analysis of modality, he can treat this theory as purely metaphysical.[344]

Compare Lewis's theory of modality with the correspondence theory of truth. The correspondence theory, roughly states that a sentence *s* is true iff *s* stands in relation R to a fact *f*. The theory can be taken one of two ways: as a metaphysical theory of truth or a conceptual analysis of truth. Treated as a conceptual analysis, the theory appears wrong. For it doesn't seem correct to say that merely by saying something is true we commit ourselves not only to whatever commitments *s* brings with it, but in addition, the relation R and the fact *f*. On this view we cannot consistently hold that some proposition is true, and deny that there are facts. Most correspondence theorists *don't* offer the theory as a conceptual analysis, but as a metaphysical theory of truth. On this approach, we may or may not know what truth is, but if the theory is right, we should revise what we believe about truth to fit it. (Just as we would and should revise our beliefs about what matter is in the light of our best theories of it.) Likewise Lewis can propose his theory of modality as a metaphysical theory of what modality is or what makes modal claims true.[345]

Lewis need not hold that this theory is our implicit theory of modality, by means of which we understand modal claims. He can instead separate out the *analytic* from the *explanatory*, that is, explain what makes modal claims true without analysing the

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[343] See Lewis 1973, 88.
[344] This view is inspired by elements in Lewis's own thinking. See Lewis (1986, 17, 19) where he seems to be after the metaphysical source of modal truth, rather than giving a conceptual analysis of modal concepts.
[345] Many have blurred the conceptual and metaphysical aspects of Lewis's theory. E.g., Stalnaker writes: "Our modal discourse, Lewis believes, is discourse about this plurality of worlds. If it is true that there might have been talking donkeys, this is because there really are talking donkeys in one or more of these worlds"(1988, 117). Whether Lewis can separate the analytic and explanatory is a hard question, which McFetridge has an insightful discussion of in his 1990, 51.

concepts we use in grasping or making these claims. This would allow him to embrace the second horn of the dilemma above – either treat the analysis as descriptive or revisionary – while avoiding the trouble that comes with accepting both the second horn and the view that the analysis is conceptual.

This approach would however deprive him of what he hoped to achieve in the arguments I reviewed in this chapter: to ground the conceptual analysis of modality, and illuminate our modal concepts in non-modal terms. It would also mean that Lewis would have to accept that his postulation of worlds is not a part of the theory we *already* believe, but a postulation by the theorist constructing a *better* theory of the world. Furthermore, given one of the central reasons to believe there are worlds is the success of the conceptual analysis of modality, giving up the analysis means this can no longer be appealed to as a reason.

4.4 Assessment

In this chapter I have argued that Lewis's attempts at meeting the conceptual condition on analyses of modality are problematic, because his analysis doesn't appear to meet the three tests of conceptual adequacy (see §4.0). First, neither of his translation arguments nor The Theoretical Identification Argument appear to establish an *a priori* conceptual connection between modal concepts and quantifiers over worlds. Second, I argued that we don't appear to *understand* modal claims by virtue of understanding non-modal propositions quantifying over worlds. Several examples indicate there are a class of modal claims which we understand but the basis for understanding them appears not to be quantification over worlds, and there also appears to be a class of claims which we should understand, were our understanding of modality constituted by worldly claims, but do we not seem to understand. Further, I suggested that if Lewis's analysis of modality is thought to be descriptive, not revisionary, then he seems committed to the view that we implicitly operate with his theory of modality. But this seems unlikely given that (a) we don't take ourselves to have the beliefs that this theory attributes to us, and (b) *a fortiori,* we don't take the theory to correctly ascribe the content of our *modal* beliefs. Third, there is good reason to think that modal claims are not committed to the existence of worlds but Lewis's analysis of them treats them as being so committed. This

indicates that modal claims are not correctly analysed as quantification over worlds. The basis for this view is twofold: firstly that the function of possibility claims is often to retract ontological commitment, whereas for Lewis to say that possibly x is F is always to bring commitment to an object which is that possibility. Secondly, Lewis's theory requires an implausible divorce of what we take ourselves to be saying when we make modal claims, and what we are really saying. His view that we know not what we think, at least about our modal claims, is highly revisionary and so problematic with respect both to material and conceptual adequacy conditions, but especially implausible according to his own conservative methodology.

Chapter 5: Justification

5.0 Introduction

I

What calls for a justification of Lewis's theory of modality? Lewis appeared to take the following three points to do so. First, the ontology of Modal Realism appears to be in conflict with our ordinary conception of *what there is* (Lewis took this objection – which he called 'the incredulous stare' – to be among the most serious).[346] Second, the conceptual analysis of modality in terms of worlds appears to conflict with our ordinary conception of the *content* of our modal beliefs (Lewis's attempts, which I surveyed in the last chapter, to provide an argument to support his analysis is evidence that he took this objection seriously). This second reason is not emphasised as much as the first, but I take it to be a problem of at least equal significance. For both Lewis's ontology and analysis would, if accepted, require substantial revision of our pre-theoretical beliefs, and it is this which Lewis takes to be so costly to his theory.[347] Third, there are a variety of rival theories of modality to Lewis's which claim not to have the first two problems, and which purport to satisfy the material, conceptual and reductive conditions which I suggested a reductive theory of modality should meet (see §1.2).[348] So a justification of Lewis's theory would be a reason to believe his, rather than one of these rival theories.[349]

These three points are linked by Lewis's view of philosophical methodology. According to this methodology, a theory of modality – indeed *any* theory – should cohere as much as possible with the rest of our beliefs. The fact that Lewis's theory of modality appears to be inconsistent with some of our beliefs and the fact that some rival theories appear not to be, make the rival theories more appealing.[350] In

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[346] Lewis 1986, 133, 135.

[347] In one of the many places Lewis makes such a point, he writes: "A credible theory must be conservative" (ibid., 134).

[348] Ibid., 4-5, 136.

[349] It is worth being aware of a distinction which Lewis doesn't always respect between a reason to *prefer* one theory to another, a reason to *believe* some theory. If you believe a theory T you think T is true, whereas you can prefer, accept, adopt T without believing it is true.

[350] Ibid., 136, 140. If these rivals treat possible worlds as abstract objects of a kind we already take ourselves to be committed to, then such theories can seem *ontologically* more appealing. *Analytically*, the story is perhaps not

this theoretical context, Lewis is under pressure to give reasons to prefer his theory over its rivals. Though he didn't think these rival theories would ultimately work,[351] he took the threat seriously enough to come up with what he took to be his trump card, a *decisive reason* to prefer his theory over theirs: his theory does *without* modal primitives, theirs *requires* them.[352] Underlying Lewis's reason for preferring his own theory is the view that the benefits of unifying our system of the world by reducing modal notions outweighs the cost of revising the beliefs (about what there is and what the content of our modal beliefs are) required to achieve this.[353]

Lewis thought of his theory as the best theory of modality there is, and therefore the theory most worthy of belief. Reducing modality is thought to be its central 'best-making' feature which no other theory possesses. But we should remember that though the discussion of which theory is best is conducted in terms of which theory satisfies certain theoretical *desiderata*, the aim of justifying a theory is to give a reason to think it is *true*. The satisfaction of these *desiderata* are merely the *means* by which we approach the question of truth. It is important to keep in mind what the link is between the *desiderata* – such as reduction – and truth, that is, *why* their satisfaction is taken to be indicative of truth. The aim in this chapter is to understand Lewis's justification of his theory of modality and to ask whether it constitutes a reason to think his theory is true.[354]

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so different to Lewis's. For if such theories treat our modal discourse as quantification over abstract objects, this appears perhaps almost as alien to our ordinary conception of what we think about when we think modally as Lewis's theory does.

[351] See e.g., Lewis 1973, 88.

[352] While other theories, such as those Lewis calls 'ersatz', may postulate abstract entities to play some of the analytical roles Lewis's worlds play, Lewis doesn't think any of them can reductively analyse modality (Lewis 1986, 140-41). According to Lewis, the benefits such 'ersatz' analyses may bring are outweighed by having to take modal notions as primitive. For Lewis it is a "fatal objection" against such theories as analyses of modality, that they do not reduce modality (ibid., 156).

[353] Menzel makes a similar point: "Perhaps the biggest — if not the most philosophically sophisticated — challenge to Lewis's theory is "the incredulous stare", i.e., less colorfully put, the fact that its ontology is wildly at variance with common sense. Lewis faces this objection head on: His theory of worlds, he acknowledges, "*does* disagree, to an extreme extent, with firm common sense opinion about what there is" [1986, 133]. However, Lewis argues that no other theory explains so much so economically. With worlds in one's philosophical toolkit, one is able to provide elegant explanations of a wide variety of metaphysical, semantical, and intentional phenomena. As high as the intuitive cost is, Lewis [1986, 135] concludes, the existence of worlds "ought to be accepted as true. The theoretical benefits are worth it"" (Menzel 2013).

[354] Of course there may be several reasons to think a theory true, but when we justify a theory we often *take ourselves* to be giving what we think of as *the* reason, or the decisive reason, to think it true. (Bonjour notes: "It is difficult to give precise criteria for when a given reason is *the* reason for a person's holding a belief" (Bonjour 1978, 2 fn.6)).

II

It is common for scientists to aim for simple, powerful, unifying theories. Richard Feynman, for instance, described physics as follows:

> we try gradually to analyse all things, to put together things which at first sight look different, with the hope that we may be able to *reduce* the number of *different* things and thereby understand them better.[355]

Lewis, like Feynman, aims for simplicity in metaphysical theories – not only simplicity of the number of different kinds of *things* it postulates, but also the number of different kinds of primitive *notions* it uses. Lewis also takes simplicity to play a central role in the *justification* of theories, and so the apparent satisfaction of his theoretical aims become justifying reasons.[356] In the case of his theory of modality, Lewis – though he is not always careful to distinguish these points – takes the putatively *reductive* nature of his theory both to be a reason to *prefer* it to rival theories, and also to provide a reason to think it *true*.[357] The locus classicus of this view is found at the beginning of *OPW*:

> We have only to believe in the vast realm of *possibilia*, and there we find what we need to advance our endeavours. 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, the whole of what we take to be true. What price paradise? If we want the theoretical benefits that talk of *possibilia* brings, the most straightforward way to gain honest title to them is to accept such talk as the literal truth. It is my view that the price is right…The benefits are worth their ontological cost. Modal realism is fruitful; that gives us good reason to believe that it is true.[358]

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[355] Feynman 1998, 24.

[356] Some philosophers appear to collapse ideological into ontological parsimony. For instance, Michael Huemer writes that Lewis's Modal Realism is justified "on the ground that the recognition of *possibilia* reduces the number of fundamental (unanalysable) kinds we must recognize in metaphysics" (2009, 217). See also Sider 2011, 14-15.

[357] Lewis 1986, 140-41, 156.

[358] Ibid., 4. And the page before he writes: "Why believe in a plurality of worlds? – Because the hypothesis is serviceable, and that is a reason to think that it is true" (ibid., 3). Later in *OPW* Lewis writes: "Modal realism ought to be accepted as true. The theoretical benefits are worth it" (ibid., 135).

The belief in *worlds* is justified, according to Lewis, because of the theoretical benefits it brings. What are these? First of all, a range of important philosophical notions – such as property, content, proposition, and most importantly *modality* – appear to be definable in terms of worlds (apparently intensional notions turn out to be definable extensionally). Second, the diversity of notions we must treat as primitive can be decreased. If modal notions, which enter into the definition of so many other notions in philosophy can be reductively defined, then modality doesn't have to be regarded as primitive. So Lewis here advances the analytical *power* of his ontology of worlds as a reason to believe it to be true.[359] Third, belief in worlds doesn't only seem to have *analytic* benefits, but *explanatory* benefits too: Lewis takes worlds to explain the source of modal truth.[360]

III

It is strange that despite Lewis placing the whole burden of justification for his theory on its fruitfulness, specifically, its distinguishing ability to "reduce the diversity of notions we must accept as primitive", this fact has attracted little critical attention. Chihara is exceptional in treating Lewis's justification explicitly and seriously. With italics in the original, he *stresses that*:

> *the whole justification for belief in possible worlds rests on the supposed reduction in the diversity of the primitives of our total theory.*[361]

Lewis justifies his theory of modality as a *whole* – not merely Modal Realism, as Chihara seems to suggest – as an instrument to realise certain theoretical goals. The existence of worlds are primarily justified by their analytical services to theory; the analysis in turn is primarily justified by its role in decreasing the number of notions we must regard as primitive. This is not something the ontological or analytical part of the theory can accomplish alone.

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[359] As Lewis says: "systematic philosophy goes more easily if we may presuppose modal realism in our analyses" (1986, vii).
[360] Shalkowski nicely summarises Lewis's justification of his theory: "It is precisely in finding…[modal realism]…to be a simple, coherent, systematic, and extremely powerful metaphysics that leads Lewis to conclude that it has a greater claim on our assent than any competitors" (2010, 178). See also Rosen 1990, 338.
[361] Chihara 1998, 99.

Little detailed work has been devoted to Lewis's justification of his theory of modality. Even Lewis himself, whose memorable methodological maxims litter his work, says very little of substance.[362] However, even if vague and elusive, their central role providing Lewis's theory both a goal and a justification means that they demand our attention. Particularly so because these maxims are widely appealed to in current discussions in metaphysics (see §1.1 and §2.2). This absence of detailed justification is, according to Huemer, part of a common pattern in which appeals to parsimony are "usually made…without discussion of the reasons for favouring simple theories".[363] Lewis's justification of his theory of modality is a case in point, though luckily he does offer us some *clues* to his thinking.

IV

Lewis takes the distinguishing feature of his theory and the central reason for believing it true to be that it decreases the diversity of primitive notions. Why is this a reason to believe it? In other words, what is the connection between reduction and truth? The following chain of reasons can be discerned in Lewis's work, which I will call 'Lewis's justification'.

> (a) The Modal Reduction Principle: all else being equal, it is better to reduce modal concepts which are taken to be primitive in a theory.

This is grounded in,

> (b) The General Reduction Principle: all else being equal, it is better to decrease the diversity of concepts taken to be primitive in a theory.

The grounding of (a) in (b) implies that from the point of view of reduction, there is nothing specially bad about *modal* concepts. They should be reduced because they *can* be reduced, and are taken to be *primitive*, so add to the diversity of primitives –

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[362] See Oliver 1996 for a critical discussion of Lewis's insubstantial methodology.
[363] Huemer 2009, 217.

not because they are *modal*. These two *normative* principles are grounded in the following two claims:

(c) The Unification Principle: all else being equal, fewer primitives make a theory more unified.

(d) The Truth Principle: all else being equal, the more unified a theory is, the more likely it is to be true.[364]

The reason to prefer a theory with fewer primitives is that such a theory is, all else being equal, more unified than one with fewer primitives. Given that a theory which is more unified is, all else being equal, more likely true than a theory with fewer primitives, and given that truth is the goal of belief, we have reason for believing in a theory with fewer primitives. I say more about these principles in the following sections.

V

This chain of reasons drive Lewis into the counterintuitive theory that there are a plurality of worlds and our concepts of modality are quantifiers over them. It is in the context of the quest to reduce the diversity of primitives that it becomes plausible to even consider such a theory as a candidate theory of possibility. This context together with a widespread belief that modal notions come into the definition of many other philosophically important notions – what Fine called 'modal mania' – makes Lewis's reduction of modality appear more plausible than it might otherwise seem.

Lewis uses his justification to issue a challenge to opponents: 'even if your theories are equal to mine in other respects, mine still has fewer primitives, and so my theory is more likely true than yours, and so has a greater right to be believed'. In this chapter I will suggest that Lewis's justification leaves much to be desired. In particular, it is hard to see why it provides a reason to think his theory is true; that is,

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[364] Lewis 1986, 3-5.

it is unclear that it satisfies the justification condition (§1.2). This of course doesn't mean his theory *isn't* true, just that his justification doesn't appear to be a good *reason* for thinking it is. In this chapter I proceed by aiming to answer the following questions:

(A) What, for Lewis, is a primitive concept? (§5.1).

(B) What does the General Reduction Principle say? (§5.2).

(C) What do the Unification Principle and The Truth Principle say? (§5.3).

(D) Does Lewis's justification work? (§5.4).

5.1 Lewis's conception of primitives

I

'Primitive', in contemporary philosophical usage, means *undefined.* But beyond this, little is settled about the meaning of this term of art. There are at least as many different views about primitiveness as there are permissible combinations of answers to the following questions:

(A) What is the primary bearer of primitiveness? Is it words, concepts, sentences, propositions, properties or objects – or something else?[365]

(B) Is *being primitive* a property a concept has absolutely or only relative to a theory?[366]

(C) Are primitive concepts merely undefined or indefinable? Are they concepts which, in some sense, merely *stand in no need* of definition or rather, do they in some sense *resist* any attempt at definition?

(D) Are primitive concepts necessarily definers? That is, must a notion be an undefined definer to qualify as primitive, or may a primitive notion be undefined and remain idle, defining nothing?[367]

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[365] I have and will continue to speak of 'concepts' or 'notions' as the primary bearers of primitiveness.
[366] See Hossack 2007, xi for what appears to be an example of an absolute conception. An absolute conception might be defined in terms of a relative one, e.g., as what is primitive in any theory, or in non-theoretical terms. An analogy: which colours are primary seems to be something theory-relative – there are colours which are primary in some colour theories, but derived in others. But we may ask whether there is an absolute matter of fact about which colours are primary. Note that one way of understanding primitives as theory-relative is to treat them as the concepts that occur in a theory's axioms that are not defined elsewhere in the theory. On this conception see Burge 1998, 309.

(E) Do primitive concepts have special *epistemic* properties? For instance, are they *innate*? Are they concepts we *understand* immediately, under suitable reflective conditions? Or are they perhaps the notions possession of which is necessary for *thinking* of a certain subject-matter?[368]

(F) Are primitive concepts the concepts of things with special *metaphysical* properties? For instance, are they concepts of simple, or fundamental things, at least from the point of view of the theory which treats them as primitive?[369]

(G) Connectedly are primitive concepts *themselves* 'things' which are, in some sense, simple?

(H) Are primitive concepts the concepts that play a special semantic role? For instance, in giving theories their content?[370]

It is a huge and interesting topic what it is that drives different answers to these questions, and so different conceptions of primitiveness. It may well be that some of what we take to be genuine theoretical disagreement comes down to different conceptions of the roles that primitives play in a theory, and exploring this line of thought seems to me worthwhile. My focus here, however, is what Lewis's conception of primitiveness is.

II

Lewis doesn't explicitly answer this question, but appears to have a *minimal* conception of primitives, which remains neutral with respect to most of the questions above, and has the following features. First, he treats *concepts*, more precisely, *types* of concepts as the primary bearers of primitiveness (see §5.2). Second, he takes what it is to be primitive to be a theory-relative matter (which is connected to his view of

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[367] Whether there could be primitive concepts that do not define, is the question of whether primitiveness is defined in terms of the explanatory role of a concept.

[368] As, e.g., one might think the notions of space and time are in thinking of physical objects or the notion expressed by '∈' is to our thought about sets.

[369] We may distinguish here the position of e.g., Hossack, for whom primitive notions are notions of simple things (2007, xi) from Sider for whom primitive notions are notions of fundamental structures (2012, 14) from Forbes for whom primitive notions k appear to "provide the fundamental means of expression of" k-facts. E.g., modal operators are the fundamental means of expression of modal facts (1989, 78).

[370] Frege wrote: "To be sure, that on which we base our definitions may itself have been defined previously; however, when we retrace our steps further, we shall always come upon something which, being a simple, is indefinable, and must be admitted to be incapable of further analysis. And the properties belonging to these ultimate building blocks of a discipline contain, as it were in a nutshell, its whole contents. In geometry, these properties are expressed in the axioms in so far as they are independent of another" (1952, 113).

the meaning of theoretical terms, see §§4.25-4.26). If primitives are theory-relative then: (a) for some notion *k* to be primitive it must occur in a theory T, and (b) the relevant facts that determine whether *k* is primitive in T are facts about the definitional relations between *k* and other notions in T (for instance, that *k* is defined by a definite description). Third, if a notion *k* is primitive in T, it is *indefinable* in T. That is, there is no possible combination of concepts in T, such that *k* can be correctly defined in T. Putting the three points above together, we can say that for Lewis, a type of concept *k* is primitive in T just in case *k* occurs in T and *k* cannot be defined in T.

The third point above opens up a gap between what theorists may *take* to be primitive in a theory T, and what *is* primitive in it. That is, an appearance/reality divide with respect to primitive notions. For one may *think* a notion *k* is definable in T, for instance, if we take ourselves to possess a definition of *k* in T, despite *k* being in fact indefinable in T. The distinction rests on the view that what is primitive in T is grounded in matters of fact about definitional relations in T. Two connected issues stand in our way of seeing which notions are in fact primitive in a given theory. First, theories are rarely presented in a form which reflects their conceptual structure. To see that structure, theories often must be reformulated, for instance, in an axiomatic form. This *should* allow us to see which are the axioms of the theory, and so which notions can and cannot be defined in it (though see §5.4). Second, and connectedly, though a theory may contain the *resources* to define some notion in it, it can require creativity to see what defines what. Lewis, for instance, thinks that all the resources are available to us in our ordinary theory of the world to reduce modal notions – but thinks it requires his explicit formulation of Modal Realism to see that this is so.[371]

It may be objected that Lewis's theory is a revision or, as he might say, an 'improvement' on our ordinary theory. So showing that modal notions need not be treated as primitive in *his* revised theory doesn't mean that modal notions are not

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[371] The Paraphrastic Argument (§§4.23-4.24) is the clearest expression of this view. It is, for Lewis, only because we have a mistaken idea as to what our own theory of the world is, and what our understanding of the meaning of our modal expressions come to – perhaps because we are blinded and dazzled by the box and diamond – that we incorrectly treat modal notions as primitives. This is, for Lewis, an illusion, as he believes that modal notions are in fact definable.

primitive in *our* ordinary theory. I think this is a fair criticism, and whether it is successful will depend on how extensive Lewis's revision of ordinary beliefs is: that is, the extent to which the new resources he introduces make it implausible to hold that it is the theory we implicitly hold, and which, implicitly, provides the meaning of our modal discourse. This again raises the question: how can a theory we do not possess – a theory which *improves* on the theory we are taken to possess – be said to provide for our understanding of modality? I do not try to answer this question here.

5.2 The Modal Reduction Principle and The General Reduction Principle

I

The Modal Reduction Principle says that, all things being equal, it is better to reduce modal concepts which are taken to be primitive. This means that a theory which defines the modal in terms of the non-modal is a better theory, all else being equal, than one which does not. Why is this so? In other words, why is it an objection to a theory that it employs irreducibly modal notions?

According to Lewis, reducing *modality* is an instrument to "reduce the diversity of notions we must accept as primitive…"[372] or "reduce our burden of primitive notions"[373] or "cut down on primitives".[374] Here 'reduce' seems simply to mean 'decrease'. So the analysis of modality in non-modal terms is a means to decreasing the diversity of primitive notions we must accept. The Modal Reduction Principle is grounded in *general* considerations about the disvalue of excessive primitive notions, not *special* considerations about the concept of modality. So Lewis doesn't think modal notions are intrinsically bad; if it turned out that reducing the modal to the non-modal *didn't* decrease the diversity of primitive notions in a theory, he would have no reason to favour the reduction of modality.

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[372] Lewis 1986, 4.
[373] Ibid., 154.
[374] Ibid., 157.

This at least is Lewis's *official* line. We might remain suspicious that he is, at bottom, sceptical of modal notions, and this is why they are singled out for special treatment. Fine for instance hold that

> *au fond*, Lewis is as sceptical of modal notions as Quine. Neither can understand modality except as a form of regularity; and the only difference between them lies in the range of the regularities to which their respective ontologies allow them to appeal.[375]

Lewis seems to find modal notions mysterious and not properly understood until they can be reduced in a non-modal language. In 'Anselm and Actuality' he made this explicit:

> The standards of validity for modal reasoning have long been unclear; they become clear *only* when we provide a semantic analysis of modal logic by reference to possible worlds and to possible things therein. Thus *insofar as we understand modal reasoning at all*, we understand it as disguised reasoning about possible beings.[376]

But let us return to the official line, whose logic we are investigating. On this view there is nothing peculiarly bad about *modal* notions. The reason they provide such an attractive target for reduction is, on this view, that they ubiquitously enter into the definition of other important philosophical notions. It is this *role* modal notions have in our theories, rather than some feature of modal notions *themselves*, which makes them a good target for reduction. This goes together, of course, with the fact that a way can be seen to reduce them, unlike some other putative primitive notions, such as *existence* or *truth*.[377]

The General Reduction Principle grounds the Modal Reduction Principle. According to the former, it is better to decrease the diversity of concepts taken to be primitive in a theory. It is worth noting that the question of why Lewis targets modal notions *in*

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[375] Fine 2005, 2.
[376] Lewis 1983, 10, my italics.
[377] Though see Stalnaker (2012, 4) for the view that modal notions *are* much like *existence* and *truth*, and are not reducible.

particular arises because the Modal Reduction Principle doesn't *follow from* the General Reduction Principle. Just because it is better to reduce the diversity of concepts in a theory doesn't mean it is better to analyse *modality* in non-modal terms; a reductive analysis of another supposedly primitive notion might reduce the diversity of notions we must take as primitive just as well. Whether the Modal Reduction Principle is the best way of implementing the General Reduction Principle, and so reducing the diversity of primitive notions, may well vary from theory to theory depending on their resources. So to use the latter principle to justify the former in a particular theoretical context, we need to know more facts about the theory in question. Lewis sees the reductive analysis of modality as the best way of implementing the General Reduction Principle with respect to *our* shared theory of the world, because he believes that a vast range of philosophically important concepts in that theory can be defined modally, including the notions of *content*, *property*, *proposition*. And Lewis took the record of contemporary use of possible worlds to confirm this:

> philosophers have offered a great many…analyses that make reference to possible worlds, or to possible individuals that inhabit possible worlds. I find that record most impressive. I think it is clear that talk of *possibilia* has clarified questions in many parts of the philosophy of logic, of mind, of language, and of science – not to mention metaphysics itself.[378]

If you are a 'modal maniac' then reducing modality may well appear to be the best way of implementing the General Reduction Principle.[379] Nonetheless there may be *other* ways of satisfying this principle, by reducing notions other than modality. But supposing, as Lewis does, that reducing modal concepts is *in fact* the best way to decrease the diversity of putatively primitive concepts of *our* theory, then the General Reduction Principle appears to justify reducing them.

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[378] Lewis 1986, 3. Sider supports this view, and writes that "possible worlds are ubiquitous in metaphysics, and are frequently utilized in semantics, ethics, probability theory, philosophy of mind, and many other contexts" (2003, 187).
[379] For "modal mania" see Fine 2005, 9.

II

What, in more detail, does the General Reduction Principle say? To begin with, what *is* it to decrease the variety of notions a theory contains? Just as Lewis's notion of ontological parsimony doesn't count the number of *token* objects postulated by a theory, but the number of *types* of object, so the General Reduction Principle doesn't count the number of *occurrences* of primitive concepts in a theory, but the number of *types* of primitive concepts.[380] To illustrate, compare the following two modal theories of God's existence: (a) it is necessarily necessary that God exists, (b) it is necessary that God exists. Assuming that it is a *single* notion of necessity which repeatedly occurs in the two theories, then in the first theory it *occurs* twice, while in the second only once; however, the number of *types* of concept occurring in the two theories is the same in both. Conceptual diversity of a theory is measured by the number of types of primitive concept that occur in it.

And just as we speak of the ontological commitments of a theory, we may speak of the ideological or conceptual commitments of a theory. A theory T is committed to a concept type *k* if at least one occurrence of a concept of type *k* occurs in T; further occurrences of the same type of concept are disregarded. So counting the primitive concept types a theory is committed to is a matter of counting how many distinct primitive concept types have at least one occurrence in the theory.

This gives rise to a problem which Lewis doesn't address. How are we to determine *what* type a given concept falls under? I take it that we have rough and ready ways of recognising a concept as, say, a *modal* concept. But given the central justificatory role of The General Reduction Principle for Lewis's theory, a principled and detailed answer seems required. For he justifies his theory of modality in cost-benefit terms, and he takes theories committed to more types of primitive to incur very serious costs.[381] So great does Lewis take the cost of primitives to be, that he takes his theory to fare better than any plausible theory which takes modal notions as

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[380] For the ontological distinction see Lewis 1973, 87. For a useful discussion of ideological parsimony, see Cowling 2013.
[381] Lewis 1986, 4-5.

primitive. And so takes the ontological cost which his theory incurs to be outweighed by the ideological cost of excess primitives.[382]

Implementing The General Reduction Principle requires counting the number of types of concepts a theory is committed to. The first step in reducing a supposed primitive concept of a theory is to identify the supposed primitive types in that theory. To use the principle, we must have a way of determining when a concept belongs to a type, what the concept types are in a theory, and how we can recognise them. To recognise if a concept belongs to a certain type we must possess a *typology* of concept types, that is, a principled account of what concept types there are and a way of determining which types a theory's concepts fall under.[383] But *prima facie*, every concept belongs to a variety of concept types. For instance, whatever a concept is a concept of, and so whatever type it belongs to, it also belongs to the concept type *concept*. So on one typology of concepts, there is a single basic type – *concept* – which they all belong to. This typology will not, of course, be useful in comparing the conceptual diversity of theories, given that they will all be equally diverse.

Ordinarily it is no problem *not* to have an explicit typology of concepts – we all appear to get by fine without one. But when the justification for a theory depends on decreasing the number of concept types in it, more detail is called for, and here the details are lacking in Lewis's theory. To see why this is important, consider two cases: (a) there is a single primitive modal concept type, and every concept we ordinarily count as modal falls under the concept type *modal*, (b) for each different concept we ordinarily count as modal, there is a distinct primitive concept type. In a particular theory T, in which there are a variety of occurrences of different modal concepts – for instance, necessity, essence, counterfactual etc. – on the first way of counting there is a single primitive modal concept type, on the second there appear to be at least three primitive modal concept types.

It is clearly in Lewis's interest to count in the second way, and hold that each type of modal notion adds to a theory's diversity – for this weights the cost-benefit argument in his favour, so long as it can be shown that if you are committed to *some* modal

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[382] Ibid., 134-135.
[383] For general discussion of typologies, see Bassett 2012.

primitives, you are committed to a *lot* of them. That this is Lewis's view is apparent from the following quotes: "Primitive modality is bad news, and more kinds are worse than fewer."[384] And,

> I suppose the moral for a friend of primitive modality is that he has more on his plate than he thinks he has: other primitive modal idioms than just his boxes and diamonds.[385]

And finally,

> Mind you, it would be no small advance if we could explain modality in general by taking one very special case of it…as primitive. If that were to be had, the offer of safe and sane ontology with just a smidgin of primitive modality would indeed be hard to refuse. But it is not to be had…The ontological gain would have to be worth not a little primitive modality but *a lot*.[386]

So Lewis's answer to his own question "If you're stuck with primitive modality, why not enjoy it?"[387] appears to be that more primitive modal notions add to the conceptual diversity of theory, which, according to the General Reduction Principle, is a bad thing. It is fairly clear that Lewis treats each type of modal notion as a distinct primitive type, and so as each making a separate and additional contribution to the diversity of concepts in our theory. So despite providing no explicit guidance on these issues, Lewis has clear opinions concerning concept types.[388] But saying it is easy; to justify these views much more must be said. More must be said, for instance, about whether occurrences of *additional* primitive modal concepts add to a theory's burden of primitive types, or whether these occurrences are all typed at the level of being modal concepts.

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[384] Lewis 1986, 242.
[385] Ibid., 13-14.
[386] Ibid., 155, my italics.
[387] Ibid., 242.
[388] Lack of guidance is a common complaint about Lewis's methodology. See, e.g., Stalnaker 2012, 5 and Oliver 1996, 2.

5.3 The Unification Principle and The Truth Principle

I

What is the source of Lewis's desire to keep the number of primitive types in our theory as low as possible? The official line is that just as there is no intrinsic problem with modal primitives, there is no intrinsic problem with primitives in general. But if there is nothing intrinsically wrong with primitives, what is the motivation to keep their numbers down? There appear to be three reasons, which aim to account for their putative theoretical cost.

First, *understanding*. If a theory is a tool to understand the world, it must itself be understood. Primitives stand the risk of being unintelligible, and so risk that a theory built using them is also unintelligible. If a concept cannot be defined, then the question arises how we understand it and grasp it in the first place. Granted there are some concepts which we understand and are primitive, perhaps for instance, the notions of truth and existence. But the more primitives there are in a theory, the more mysterious our understanding of the theory becomes, and the more the theorist must take up the slack left by the absence of definitions in the theory.[389] By this, I mean that if the *theory* doesn't explain what a concept means, the *theorist* must bring his prior understanding of the concept to the theory. Note that primitives become excessive, on this view, because of the nature of the mind of the theorist; different kind of theorist, different verdict on what counts as an excessive number of primitives. For a theorist who already grasps every concept, there would be no harm if a theory contained any number of primitives, for there would be no chance that the theorist would fail to understand some concept of the theory.

Second, *explanation*. A reason to keep primitives to a minimum is that on a metaphysical view of primitives – e.g., according to which they are concepts which correspond to simple objects or contribute towards expressing basic facts – then the more primitive concepts there are in a theory, the more brute unexplained facts there are, according to that theory.[390] For instance, in a theory which treats modal notions

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[389] See Lewis 1986, 157, 178-79, 182, 188, 261.
[390] Ibid., 141.

as primitive, and the modal facts expressed by means of them as basic, modal facts must be accepted as brute and unexplainable.[391] Or take knowledge. If the concept of knowledge is primitive in virtue of standing for a simple mental state, then nothing can be said about the inner workings of that state and so it must be taken as brute and unexplained why knowledge has the properties it does (such as, factivity).[392] Metaphysics, as an explanatory project, requires as few (metaphysical) primitives as possible, so as to keep the number of unexplained facts to a minimum.

Third, *unity*. On this account of the cost of primitives, the more primitive types in a theory, the less *unified* it is. One of the measures of theoretical unity is how many basic axioms a theory contains, another connected one is how many primitive types of concept it contains. Both appear to contribute to theoretical unity in a similar way: the theory can be formulated more compactly, using fewer basic principles and fewer basic notions. It is a widely shared theoretical aim to construct as powerful a theory as possible, from as slender an ideological and ontological base as possible. Lewis appears to take achieving unity as the most serious reason to keep the number of primitives to a minimum. Ultimately, on this view, it is the connection of this kind of theoretical simplicity to truth that is to be the reason to favour ideologically parsimonious theories.

II

The Unification Principle expresses the concern of the third answer above, which provides the central reason behind Lewis's drive to cut down on primitives. Reducing modality, in particular, is justified as the most effective way to decrease the diversity of notions in our theory. And decreasing this diversity is in turn justified by the fact that (a) fewer primitives make for a more unified theory, (b) unity makes for truth, and (c) truth is what we want a theory for. Unity, truth and reduction of primitives are, on this view, intimately related. Expressing the connection of reduction and theoretical unity, Lewis writes:

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[391] See Kriegel 2013, 22
[392] See Williamson 2000, 21-48.

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, the whole of what we take to be true.[393]

Decreasing the diversity of primitive notions is not valued *in itself*, but as a *means* to improving theoretical unity and economy. It is hard however to find in Lewis's writing a precise account of *what* theoretical unity and economy are, and of *why* they constitute improvements to theory. Given that the aim of theorising is truth, it must be that Lewis takes theories which instantiate these virtues to be more probably true than theories which, all else being equal, do not. This is what the Truth Principle states. The link to truth is vital in order for the Unification Principle to provide a reason to not merely *accept* one theory rather than another, but to be a reason to *believe* that one theory rather than another is *true*.

Why does unity make for truth? Clearly, not *any* unified set of propositions is true. A more or less unified fiction is, after all, still a fiction. The thought is that for sets of propositions which we *already take to be by and large true*, a more united version of them is more likely to be true. In *Counterfactuals*, Lewis describes the method of reflective equilibrium as expanding "preexisting opinions" into an "orderly system".[394] Likewise, he describes how a doctrine may "command our belief by its systematic beauty and its agreement with more important common opinions".[395] In *OPW* Lewis writes:

> it is pointless to build a theory, however nicely systematised it might be, that it would be unreasonable to believe. And a theory cannot earn credence just by its unity and economy. What credence it cannot earn, it must inherit.[396]

And

> [We] began with our abundant modal knowledge, particular and general. We know that there might be a talking donkey; and we know a general principle

[393] Lewis 1986, 4.
[394] Lewis 1973, 88.
[395] Ibid.
[396] Lewis 1986, 134.

which tells us, for instance, that if there might be a talking donkey and there might be a philosophising cat, then there might be both together side by side. I want to incorporate this knowledge into a systematic theory. Accordingly, I uphold modal realism.[397]

A theory must, on this view, be conservative to be credible (conservative not only with respect to the beliefs the theory directly concerns, in this case modal beliefs, but *all* our beliefs). Unification only makes a theory *more* credible when it is applied to a theory which is conservative with respect to our beliefs, and so is *already* credible. If a variety of conservative theories are each systematisations of our beliefs, then their unity would become relevant in working out which, if any, to believe. It is hoped that the theoretical tools applied to our pre-theoretical beliefs (which are thought to be, by default, broadly true) are truth-*enhancing*.

The two forces here which provide reasons for belief are Neurathianism and Quineanism. The former brings the background assumption of this conservative approach which is a principle of charity as a matter of theoretical necessity, not choice. The metaphysical version of this principle is that most of our beliefs are true; a weaker epistemic version is that we must *treat* most of them as true in order to improve our theory of the world.[398] The latter brings a holistic picture of belief and the view that ontological and ideological parsimony are central theoretical virtues. Philosophy is then given a role in bringing unity to our body of belief, so improving our theory of the world while leaving it substantially as we found it.[399] Specifically, philosophical analysis is, for Lewis, a tool for cutting away notions regarded as primitive by showing them to be definable within the theory. Conceptual analysis thereby contributes towards decreasing the number of primitive concepts in our theory, thereby making it more unified, and so, if the Truth Principle is correct, increasing the likelihood of its truth.

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[397] Ibid., 108.
[398] See Williamson (2007, 5) for the good point that the Neurathian stating point *isn't* our epistemic situation. Our epistemic situation also includes "significant knowledge of the world".
[399] Lewis 1986, 134.

III

The Unification and Truth principles make appeal to theoretical unification. Lewis takes the theory which is unified to our theory of the world, that is, all our beliefs.[400] But what *is* it to bring unity or systematicity to our beliefs?

First, what are 'our beliefs'? 'Our beliefs' must be understood as time- and person-relative. Time-relative because what we take to be true changes over time. Whose beliefs are 'our beliefs'? I understand 'our beliefs' to be the beliefs which the speaker has in common which a community to which she belongs. And this is why 'our beliefs' is person-relative. So 'our beliefs' refers to a snapshot of the beliefs the speaker shares with a community at a time.[401]

Second, what is it to *systematise* belief, in pursuit of the truth? It must at least mean: to render it consistent, for if a theory is inconsistent it is necessarily false. More substantially, it seems to mean: to axiomatise. A systematic theory of what we believe will then be an axiomatic theory in which our beliefs will count among its axioms or theorems. A central reason for thinking of systematising as axiomatising is that it is only if theories have an axiomatic form that it makes sense to ask precise questions about unity or economy which can be measured, and compared. For instance, questions about the number of primitive concepts, and the number and length of axioms.[402]

Third, *how* is our theory to be systematised? Typically, it occurs in piecemeal fashion. A theory is proposed to deal with a small part of our beliefs. Take our modal beliefs. The theory should account for our modal beliefs, without disturbing the rest of our beliefs. It provides translation rules or conceptual analysis, so that we can recognise the new theory as a correct systematisation of our modal beliefs. With respect to Lewis's analysis of modality some questions arise, including: does its ontology disturb our ordinary beliefs too much? Is the conceptual analysis correct?

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[400] Lewis 1986, 4.
[401] Many more questions can be asked about 'our beliefs', including: How is the relevant community of the speaker to be specified? How are 'common beliefs' to be differentiated from other beliefs?
[402] Axiomatisations of mathematics are the paradigm here, which doesn't escape Lewis's notice. See 1986, 3-5.

Does the analysis itself lead to a revision of our beliefs about the content of modal and meta-modal propositions?

IV

Systematisation is partly motivated by theoretical goals, such as unity. But it can also be seen to satisfy Lewis's goal for his analysis to contribute towards our understanding (see §2.2).[403] Systematising our theory can be thought of as a way of coming to better understand what we already believe. This may just be the common thought that *axiomatising* our knowledge of a subject-matter, is a way to understand better what we already know, whether or not this effects a reduction.[404] I take Lewis to see three different senses in which systematising a theory is good for understanding.

First, reducing a theory's central concepts in a systematic theory allows us to define what was previously undefined. That a concept is undefined doesn't mean we do not understand it – it better not, if as some think, all concepts rest ultimately on primitives. However, defining a concept provides an explicit means of understanding it. Lewis seems to endorse the view that, with respect to notions treated as primitive, 'I *reduce* in order to understand, unless I reduce I shall not understand'. For Lewis, systematising a theory appears to aid our understanding by providing definitions for concepts regarded as primitive (a) whose intelligibility is in question and (b) which, because they are regarded as primitive, are unexplained in more basic terms.

Second, sometimes Lewis appears to mean by 'understand', 'render in a first-order language'. In this sense, by showing modal discourse to be expressible in a first-order language he can take it to be better understood.[405] This Quinean idea is based on the thought that we understand the workings of first-order languages better than

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[403] See Lewis 1986, 4, 164 and 1983, 10.
[404] Wayne Davis writes that: "One way to increase our understanding of a subject is to systematize what is known about it. One way to systematize a body of knowledge is to organize it into a deductive system. In such a system, some terms are taken as primitive and others are defined. Some principles are taken as postulates and others are derived as theorems. Other things being equal, the greater the completeness and economy of the system – the greater the proportion of the knowledge incorporated, and the fewer the number of primitive terms and principles – the better the systematization. To the extent that it increases the integration of our knowledge, systematization increases our understanding" (2003, 11).
[405] Or, perhaps better put, we have a better understanding of our understanding. Lewis's starting point is that we *do* understand modal discourse – the question is *how*. It is the *how* which he wants to make explicit.

any others – so by formulating a claim in this language, we thereby understand better what the original claim meant. If a notion is resistant to formulation in the language which is the hallmark of understanding, it is on this view a suspect notion.

Third, Lewis certainly thinks that if we can understand a subject-matter with fewer primitives we understand it better than we do if we understand it using more primitives. This may be explained psychologically, by a theory of mind and the mental resources a thinker has to muster to grasp the subject-matter. It is, after all, more psychologically plausible to attribute to us a simpler rather than a more complex theory.[406]

Lewis can take his theory of modality to aid our understanding of modality in all three ways.[407] This doesn't *justify* his theory – doesn't give any further reason for thinking it true – but it is, for Lewis, another important effect of unifying it, and making our implicit understanding of modality, explicit. This reflects the thought that Lewis takes his two goals of analysis – of increasing unity and understanding – as two sides of the same coin.

5.4 Objections to Lewis's justification

I

There may be reasons to believe *p* that we do not know, and so cannot be reasons we can *use* to justify *p*. In appealing to a reason to justify a theory, that reason must be available and if it is general, it must be clear how it applies to justify the particular theory in question, such that the probability of the truth of that theory is raised. I argue Lewis didn't develop his justification enough for it to provide a reason to believe his theory of modality. Further, there are a number of problems with his justification, which I now outline.

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[406] There is of course a trade-off to be made between *conceptual* complexity and *computational* complexity.
[407] Whether any of these senses of 'understand' correspond to our ordinary notion of understanding I leave an open question. But there may be a difference because what Lewis seems to want is an *overall* increase in our understanding of our theory. If this comes at the cost of distorting our original beliefs, then it would be a case of misunderstanding, despite a reduction in primitives.

There are three problems with Lewis's justification. First, the Quinean ideal that drives Lewis's understanding of the costs and benefits of theories is that our beliefs form a coherent theory of the world, and philosophy's aim is to refine and improve that theory. To think that there is a single theory in which all human theoretical endeavour fits in, requires thinking that there are three unities: of science, of ordinary belief and of the two together. I argue that there are reasons to think that the three unities are mythical. Second, in order to judge that one theory of modality is more or less costly than another, there must be some way to compare rival systematisations of our modal beliefs. I argue that it is hard to see how such comparisons can be made. Third, there appears not to be a consensus in philosophy about what it is about a theory that counts as a cost and benefit. Lewis tends to assume that, in the case of the theory of modality, the value of theoretical unity outweighs the disvalue of revising our conception of what there is, to encompass the pluriverse. Without this weighting of costs and benefits being something everyone agrees to, we would expect an *argument* to explain why they are as Lewis takes them to be. But Lewis not only doesn't give one, but doesn't appear to think an argument can be given. This restricts the audience who can accept his justification to those who are *already* convinced that Lewis trades-off ontology and ideology in the right way. The rest of us may be understandably unmoved by his justification.

II

(1) Lewis assumes that our beliefs form a whole, a single body of belief. This conception of our beliefs as being a single interconnected whole is the same as Quine's holistic vision of our "system of the world" or "web of belief".[408] On this view, we may speak of our theory of this or that, but these are really ways of restricting attention to areas of our system or web. Lewis's project of systematising belief – which in practice is carried out piecemeal – aims at unifying *all* our beliefs. This is reflected in the way Lewis treats the costs and benefits of a theory, which takes into account both the question of whether it validates our beliefs about its subject-matter, but *also* the whether it mutilates our other beliefs. For instance,

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[408] This picture of belief can be thought of both as a conception of the psychology of believers or as a more abstract or idealised conception of the structure of belief.

Lewis is concerned that his theory of modality disagrees with our beliefs about what there is, even though he takes his theory to do its job of validating our modal beliefs.

For consistent conservative systematisations of all our beliefs to be possible, it must be that our beliefs ultimately form a unity. For were any substantial part of our beliefs inconsistent with any other then there would be no way to systematise them without leading to substantial revision, and so any systematisation would be unconservative. I suggest that to consider our beliefs as unified, we must assume three unities: of science, of ordinary belief and of the two together. Each unity makes possible a systematic theory of *those* beliefs; the last, makes possible a unity of *all* our beliefs.[409] How plausible are these unities?[410] The first unity appears implausible. For Feynman, science aims

> to see complete nature as different aspects of one set of phenomena….[I]s it going to be possible to amalgamate *everything*, and merely discover that this world represents different aspects of *one* thing? Nobody knows.[411]

Though Lewis doesn't subscribe to the view that there is only *one thing*, he does think that it is possible to amalgamate all beliefs – including scientific beliefs – into a *one theory*. However, not only is it *conceivable* that there exist inconsistencies in the sciences, but it is a *fact* at the time of writing. We can divide the inconsistencies into the *intra-* and *inter*-scientific. Some of the intra-scientific inconsistencies are well known, such as those within physics.[412] Inter-scientific inconsistencies are harder to pin down, but it is hard to believe that as things currently stand in science, all the sciences are consistent with each other. Take the following example: metaphysics, according to Lewis, postulates a plurality of spatio-temporal worlds, some of which break physical laws. Whatever worlds physics may postulate, it does not postulate worlds which break physical laws. Given that physics quantifies over

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[409] This assumes artificially that all our beliefs are either ordinary or broadly scientific. This is artificial partly because no clear line can be drawn between the two, and partly because there may be beliefs that are not rightly classified by either. Further, I should say that I use 'scientific' in its broad sense, not as restricted to the natural sciences.

[410] Thanks to Ian Rumfitt who pointed me in the direction of this question.

[411] Feynman 1998, 26

[412] E.g., Sushkov writes "It is remarkable that two of the greatest successes of 20th century physics, General Relativity and the Standard Model, appear to be fundamentally incompatible" (2011, 171101-1). For philosophical discussion of alleged inconsistencies in science, and how we may think about them, see Vickers 2013.

all of spatio-temporal reality, there is an inconsistency between the verdicts of Lewisian metaphysics and physics.[413] Were Lewisian metaphysics the standard view in metaphysics and the multi-verse theory the standard view in physics, this would be an example of an *inter*-scientific inconsistency.

The reason the two kinds of inconsistency are problematic for Lewis is that they stand in the way of the view that our beliefs can be systematised without a great deal of mutilation. If science is inconsistent, then any systematisation of our beliefs must take sides on matters of scientific controversy. Not only are philosophers not in a position to do this, but any attempt to do so would require wholesale revision of belief. We cannot both preserve our scientific beliefs and have a consistent conception of science, when science itself is not consistent. Given science is inconsistent, it appears that the view that it can be systematised is based more on the *hope* that, beneath apparent contradictions, there lies unity. Feynman-like modesty about such projects seems to be the correct position in our current state of knowledge.

The second unity, of current common belief, likewise appears implausible. Take for instance the following commonly held beliefs: that it is wrong to do things that cause harm to animals, that it is not wrong to eat animals, and that eating animals in various ways causes harm to animals.[414] These beliefs appear to be inconsistent. I take it that there are many similar sets of inconsistent beliefs among our common beliefs. Just as systematising our scientific beliefs requires decisions to be taken about which scientific theories are correct, and so requires radical revision of our scientific beliefs, so too with our common beliefs.

With respect to the third unity, it follows from the inconsistency of either scientific or common belief that the unity of them both must too be a myth.[415] So I conclude

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[413] This is roughly Williamson's argument in his 2013, xiii.

[414] Widespread discrepancy between explicit belief and *action* may also reveal unobvious contradictions in our ordinary belief system.

[415] An example of a special inconsistency of common belief and science is the view that the movement of material entities can be deterministically explained by physical laws, and the view that we are material entities whose movement is free and so non-deterministic. Whether this is a good example depends on whether compatibilism is true; but the very existence of compatibilism reflects a recognition of a real tension in our thought.

that the three unities appear mythical. The project of constructing a single conservative systematisation of our beliefs requires that any inconsistency among our beliefs is not fundamental, and disguises a single unity. But this seems to be a view caused more by a wish fulfilling projection than it is grounded in the nature of our beliefs.

Lewis might respond that the initial beliefs which are systematised should be understood to be cleaned up or idealised prior to, as laying the groundwork for, systematisation.

Our beliefs will be idealised so as to include only *consistent* beliefs. Then the work of systematisation will be to take a consistent construal of our beliefs and unify *it*. However, though cleaning up relatively trivial inconsistencies seems unproblematic, how are we to clean up *substantive* inconsistencies? If current physics is inconsistent it is so for good reason. The attempt to idealise away such inconsistencies would land as squarely back into the problem dealt with above, of how a systematic philosopher is to pronounce on issues of scientific controversy in order to unify our beliefs, and how this is to be done in a conservative fashion. The substantive point is: idealisation *is* a form of systematisation, so the proposal to idealise away substantial inconsistency *before* systematisation begins seems implausible.

III

(2) For Lewis's justification to be persuasive it requires first, that we can make judgements about whether systematisations of our beliefs are more or less unified than the initial beliefs themselves, and second that we can make judgements about rival systematisations so that they can be ordered from the most to least costly. The first requirement arises because Lewis takes his theory to reduce modality and so decrease the diversity of notions we must take as primitive. The second requirement arises because Lewis takes his theory of modality to be better than his rivals' theories in virtue of his theory requiring fewer primitives than theirs and so being more unified, and so being less costly. I now turn to problems with each requirement.

Comparisons of our beliefs to systematisations of them must be made in order to determine whether a systematisation is more or less unified than the original beliefs. After all, the whole point of systematisation is to *improve* our beliefs.[416] Recall that for Lewis the question of the unity of a theory is only relevant if the theory is conservative with respect to our beliefs not only about the subject-matter in question, but also the rest of our beliefs.[417] To determine if a putative systematisation improves our beliefs we must find out whether (a) it is conservative with respect to the target beliefs, and (b) whether it is more or less unified than them. Suppose T0 is all our beliefs about some subject-matter, and T1-Tn are rival systematisations of T0. To determine the extent to which T1-Tn are *conservative* with respect to T0, we need to compare T0 with T1-Tn. To determine the extent to which T1-Tn are more *unified* than T0, we need to compare the diversity of primitives in T0, with those in T1-Tn; and likewise, any other measure of unity.[418] How, though, do we make such comparisons between our beliefs and systematisations of them? To begin answering this I now look in more detail at what Lewis takes to be the two most important properties of systematisations of belief: conservativeness and unity.

(A) *Conservativeness*. A *conservative* systematisation of our beliefs contains as few propositions as possible that disagree with the original beliefs, and as many as possible that agree with them.[419] To determine whether a systematisation is conservative then requires comparing the propositions we believe to the propositions of a given systematisation. Given that Lewis doesn't take us to have a perspicuous understanding of the content of our *own* beliefs (see §4.32) – his conceptual analysis of modality is evidence of this – it isn't clear how this comparison is to be made. For to compare T0 with, say, T1, we must first be clear about what the propositions are which constitute T0. It is, however, only by systematising belief that Lewis takes us

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[416] Lewis 1986, 134.

[417] I will simplify this below by assuming that a theory must only be conservative with respect to *relevant* beliefs. So .e.g., a theory of modality must be conservative with respect to *modal* beliefs. The simplification is harmless here because we are looking at questions of unity alone. Below I bring back considerations of conservativeness with respect to *all* our beliefs when I look at questions of trade-offs between ontology and of ideology.

[418] For instance, if the theories are axiomatised, the number and length of axioms.

[419] Of course the situation with respect to our actual beliefs is more complex than this. First our beliefs come in degrees. Second, there may be beliefs or propositions of a theory which neither agree nor disagree with each other, if the theory and our beliefs do not pronounce on everything the other does. Third, not all beliefs are equally important, and the more important (say, the more general) beliefs are more important to conserve. So we shouldn't just look at number of propositions conserved, but also their importance. Lewis writes on this: "Some common sense opinions are firmer than others, so the cost of denying common sense opinion differs from one case to the next" (1986, 134).

to have a reflective understanding of what our initial beliefs are. To systematise our beliefs then appears to require a *prior* systematisation, and this seems regressive. This problem is compounded by the fact that many of our beliefs are too uncertain or vague and too hard to articulate without context to undergo systematisation. If systematisation is to be conservative it must respect these features of belief; if it idealises such features away, it risks setting aside a large chunk of our epistemic life.[420]

(B) *Unity*. Worse still, we don't seem to have a way of determining how *unified* our ordinary system of beliefs are. For supposing unity is measured in terms of diversity of types of primitives, if we do not have a perspicuous access to the propositions which constitute our beliefs, we do not have access to which concepts of our theory we treat as primitive, and so we do not know how many primitive concepts there are in it.[421] It seems that precise comparisons about diversity of primitives can only be made between already axiomatised theories[422], and so again, to compare our beliefs with systematisations of them presupposes prior systematisations of our beliefs, which appears regressive. If that is so, then while the systematisations T1-T*n* might be compared if they are axiomatised theories, none of them can be compared with T0 in order to determine if any is more or less unified than it, for T0 isn't yet axiomatised. Deciding, then, on whether any systematisation of T0 is more unified than *it*, cannot get started if such comparisons can only take place between axiomatised theories. We can perhaps discuss which of two axiomatisations are more unified, but not which is more unified than the theory they purport to axiomatise. We cannot say, for instance, that T1 reduces *modality* which is primitive in T0, unless some reliable method is found which tells us how things stand with T0 with respect

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[420] See Chihara (1998, 99) for a similar point. Interestingly, Rawls's method of reflective equilibrium also throws out vague beliefs in a bid for systematicity. Bonevac describes Rawls's method as follows: "We begin with a set…of considered judgements. We examine our moral intuitions, that is, and throw out those that are unstable, vague, or in which we lack confidence. We retain only those we are willing to affirm confidently after careful thought. We provisionally adopt a decidable set…of principles from which, we conjecture, the considered judgments might be derived" (2004, 366). Bonevac, in a footnote on this passage takes the set of principles to be axiomatisable, and that "the set of principles is decidable to capture the idea that we should think of them as ethical axioms…" (ibid., 366 fn. 10). While systematisation of our belief relies on treating them as an implicit but precise folk theory lying behind our thought and talk, it is more accurate to think of our view of the world as a picture, some parts of which are in focus, other parts blurred, and most somewhere in between.

[421] Indeed, if we understand systematisations of our beliefs as revealing the true folk theory that lies behind them, then it is only through systematisations of belief that we can know what is primitive in them.

[422] And even here things are not so simple. For even looking at the concepts used in the axioms of an axiomatised theory doesn't show us which concepts are primitive. For it is not easy to distinguish concepts in a theory with *no* definition from those which are *implicitly* defined in it. See Kriegel (2013, 19) for problems with objectively measuring theoretical simplicity.

to its primitive concepts (the point here is similar to one made in §4.22 about translation). Chihara echoes this concern, which is brought out in a discussion of whether Lewis's 'worldmate relation' is primitive. He writes:

> I do not see how one can determine with any degree of confidence whether the total number of primitives needed to spell out Lewis's theory of worldmatehood will be less than or no more than a competing theory that takes the worldmate relation to be primitive, in the absence of anything like a total theory in which these competing theories are to be placed…How can one tell if the set of primitives of the new theory is more or less than that of the old theory, if one has no clear idea of just what primitives the old theory has?[423]

It appears that to judge whether a given theory has fewer/greater number of primitives than our 'folk theory' or that it conserves or fails to conserve our beliefs, is harder than one might think. Indeed, it is only by treating our beliefs as a kind of theory, that it even makes sense to think there can be such comparisons. But *calling* it a 'Folk Theory' doesn't make it amenable to these comparisons; and we cannot assume that it is anything like an axiomatised theory, which would make such comparisons possible. If such comparisons cannot be made, then while axiomatised theories may be compared for numbers of primitives, it can be said of no theory that it better conserves *our* beliefs, or has fewer primitives than the totality of *our* beliefs, and so it cannot be said that such theories *improve* on our beliefs because they decrease the number of notions we must accept as primitive.

IV

I now turn to the second assumption about comparison, that we can make judgements about rival systematisations so that they can be ordered from the most to least costly. For even if we suppose we could make the comparisons I question above, so that we have an answer as to the relative conservativeness and unity of theories $T0$-Tn, can we then compare theories $T1$-Tn so they can be ordered most to least costly, and so determine which is (or are) the winning theory (or theories)? The

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[423] Chihara 1998, 80.

winning theory, assuming they are equal in other respects, should be the one which makes the least revision to T0, while achieving the greatest unity.

Lewis certainly thinks that we can compare different systematisations and order them in terms of cost. This is vital to his view of how his theory of modality, and in particular, his ontology of Modal Realism, is justified; it is, he thinks, the least costly systematisation available.[424] He accepts that while postulating the pluriverse is costly because it revises our belief that there is only one world, it is worth it because it makes our theory so much more systematic. He writes, objecting to the view that Modal Realism is implausible, and "at variance with commonsensical ideas about what there is" that

> I take this to be a fair and serious objection, but outweighed by the systematic benefits that acceptance of modal realism brings.[425]

And again, hinting at what he takes his theory of modality to achieve, he writes

> [s]ometimes common sense may properly be corrected, when the earned credence that is gained by making theory more systematic more than makes up for the inherited credence that is lost.[426]

This 'trade off' presupposes that the costs that arise from unconservativeness and the benefits that arise from unity can be weighted and 'traded' in the same coin. But how are such trade-offs to be carried out, what is to guide us in making them? Lewis says that such trade-offs are "matter[s] of balance and judgement".[427] But he provides no rules or guidance for deciding when, for instance, a belief is too important to relinquish in exchange for decreasing a theory's primitive notions.[428] What he provides is, as Oliver has noted, more "gestures than explicit rules".[429] In the end, Lewis resorts to *personal* authority. Discussing the 'incredulous stare' objection to his theory he writes:

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[424] Lewis 1973, 88 and 1986, vii, 135, 141.
[425] Lewis 1986, vii.
[426] Ibid., 134.
[427] Ibid.
[428] As Stalnaker wrote "the reflective equilibrium method does not offer much guidance" (2012, 5).
[429] Oliver 1996, 2.

> I suggest…a simple maxim of honesty: never put forward a philosophical theory that *you yourself* cannot believe in your least philosophical and most commonsensical moments. The incredulous stare is a gesture meant to say that modal realism fails the test. That is a matter of judgement and, with respect, *I* disagree. I acknowledge that my denial of common sense opinion is severe, and *I* think it is entirely right and proper to count that as a serious cost.[430]

However the *judgments* about what is worth what are not backed up with *principles* or *criteria* of application. And in the end Lewis appears to concede that he cannot provide grounds for his cost-benefit assessment. He continues,

> How serious is serious enough to be decisive? – That is our central question, yet *I don't see how anything can be said about it*.[431]

But then, dogmatically, sticks to his guns:

> *I still think* the price is right, high as it is. Modal realism ought to be accepted as true. The theoretical benefits are worth it.[432]

We are left, in my view, with little understanding of how to compare the cost caused to theories by unconservativeness and disunity. Lewis tells us that it is better to have all his worlds and a unified theory, than a less unified theory and just our world. But no grounds can be given for why this is so.

It may be objected that judgements about such trade-offs are an *art* for which no recipe or governing principles can be given. Just as judges of blancmange contests the world over reliably weigh the lightness, taste and wobblyiness of the gelatinous desert without being able to formulate explicit rules by which they make trade-offs to reach final verdicts, so too theorists weigh the theoretical properties of theories,

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[430] Lewis 1986, 135, my italics.
[431] Ibid., my italics.
[432] Ibid., my italics.

such as conservativeness, unity, beauty etc., and likewise, no explicit rules governing the trade-offs can be given.[433]

The problem with this response is that it is only because blancmange competitions produce reliable winners that we accept the verdicts of blancmange judges without understanding how they come to their results (we accept the *art* without the *mechanism*). Were such competitions to always end in disagreement, we would not accept that there is an art to such judgements. In philosophy, while there may be consensus about what the desirable theoretical properties are, there is no consensus as to how particular competitions are to be judged, and who the winners are. Indeed, to the extent to which there is consensus on the case in question, it urges us *against* Lewis's view of the results, towards the view that in the trade-off of worlds against modal primitives, the former are worse than the latter. For Lewis to convince us that our assessment of the trade-off is wrong, we would need details about how he took trade-offs to generally work, and in particular how it works in the case of his theory of modality – details which he never supplies. If Lewis's justification is to be convincing then it must be transparent, and the appeal to the authority of a 'good judge' or to 'you'll recognise a good trade off if you see it – so long as you're an expert' doesn't help. Perhaps he is right about trade-offs, but we cannot know this, and so it cannot be a reason to believe his theory.

V

(3) I now turn to the final objection, and move from the question of how costs and benefits of theories may be *compared* to the basis for determining what the costs and benefits *are* to begin with. The use of Lewis's justification in assessing trade-offs of ontology and ideology presupposes a certain view of what counts as a theoretical cost and benefit. He takes the *proximate* goal of theorising to be unifying our beliefs in order to conserve and improve them; and the *ultimate* goal to be discovering the truth, to ensure that *all* of our beliefs are true and that *more* of what is true and important is among our beliefs. However, there is no consensus on unity as the main proximate goal of philosophical theorising, in part because there seems to be no

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[433] Thanks to Keith Hossack for this response and example.

simple connection between unity and truth.[434] This makes Lewis's justification which expresses this connection unlikely to be accepted by those who take a different view about what counts as a theoretical cost and benefit, or those who take a different stance on the connection between unity and truth.

Bernard Williams once asked, concerning theorising about ethics,

> Why should theoretical simplicity and its criteria be appropriate? Whether they are must surely depend on what an ethical theory is for.[435]

Williams's point applies to Lewis's theory too. Stalnaker is an example of a philosopher who has a different view of what the proximate aim of theorising is, and perhaps also what its ultimate aim is. It is not that he has anything against elegant theories, but doesn't think that a more unified theory is always better. He writes, with respect to a theory of modality, that there are

> real tensions in our modal concepts. Sometimes the problems that a theory brings to the surface should count as benefits, rather than costs, of the theory…[436]

This is a conception of philosophy which values giving a reflective, accurate account of our modal concepts and beliefs, even when they have "real tensions". On this view, a more unified theory may be a *worse* theory, because it doesn't reflect the real content of our modal beliefs. If Lewis's theory of modality is thought of as our implicit 'Folk Theory', then Lewis has a very optimistic view of our concepts as being in perfect order; Stalnaker has a less optimistic view, and wants a theory of modality to mirror *that*, not improve it for the sake of unity. A representation of our concepts in perfect order is *unfaithful* to concepts in real tension. Stalnaker's project aims not at systematising our modal beliefs in a more united theory, by reducing modality, indeed he writes

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[434] See e.g. Bennett 2005, 284 and Stalnaker 2012, 5, 131.

[435] Williams 2006, 106

[436] Stalnaker 2012, 131. Compare to Bonevac on Rawls: "Other things being equal, simplicity is preferable to complexity, but a distorting simplicity is worse than none" (2004, 111).

if an account of modality were to meet this condition [of reduction], that would be a sure sign it was on the wrong track.[437]

Rather than *improving* our modal beliefs, for Stalnaker the point of a possible worlds framework to be

not reduction but *regimentation*…a procedure for representing modal discourse using primitive modal notions, in a way that helps reveal its structure.[438]

So his aim is a theory by which we can represent modal content. Lewis's justification, which incorporates the goal of systematising modal belief, simply isn't going to persuade philosophers such as Stalnaker. Stalnaker's view of the point of the possible worlds framework is a particular case of a more general approach masterfully summarised by Michael Dummett:

Philosophy attempts, not to discover new truths about the world, but to gain a clear view of what we already know and believe about it. That depends upon attaining a more explicit grasp of the structure of our thoughts; and that in turn on discovering how to give a systematic account of the working of language, the medium in which we express our thoughts.[439]

What Lewis needs is an *argument* to support his own determination of what counts as a cost, and what a benefit; without this, his justification has limited appeal. That is, he needs a reason to think that his own appropriation of philosophy's role – "to improve the unity and economy of the theory that is our professional concern"[440] – is persuasive, rather than a conception like Dummett's. What grounds Lewis's conception of what counts as a theoretical cost and benefit? It is his holistic understanding of our beliefs and his focus on unity which drives his view of what the theoretical costs and benefits are. And it is this which allows him to say that his

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[437] Stalnaker 2012, 4.
[438] Ibid., 11, my italics. Compare with Rayo 2008 and 2013 who, inspired by Stalnaker, has as his primary aim for a theory of modality the representation of content.
[439] Dummett quoted in Pyke 1990.
[440] Lewis 1986, 4.

theory is not only better than its rivals but also more likely true. But what the connection between unity and truth is is still unexplained.

Lewis appears to face the following dilemma about unity as a ground for his conception of what the theoretical costs and benefits are. Take some theory T which is justified in terms of its unity. Either there is a *reason* for the truth of T being justified in terms of unity or there is not. If there is a reason, it will either invoke unity or it will not. If it invokes unity the reason is circular. If it does not, then either there is a reason for the truth of T which doesn't depend on unity or else there is no reason for the truth of T being justified in terms of unity.[441]

Even if a systematisation of the kind Lewis desires were plausible, and our beliefs could be unified, this would only justify Lewis's theory of modality insofar as unity is a reason to think a theory *true* in philosophy, not merely rationally acceptable.[442] What grounds could there be to think that unity plays a *justificatory* role? The standard reasons given to *prefer* unified theories are aesthetic and so don't engage with the epistemic or justificatory question in hand.[443] One possible answer that does is metaphysical: it is because reality is simple that a simple theory is more likely to reflect the way reality is.[444] This, and other similar metaphysical reasons, are problematic in two ways. Firstly, given that the relevant form of simplicity we are discussing is ideological, and so concerns primitive notions, the view above relies on a metaphysical conception of such notions, according to which the diversity of primitives of a theory reflects the complexity of reality. But this is not the standard view of primitives and not (as I outline in §5.1) Lewis's. Secondly, the metaphysical basis for the connection of unity to truth relies on a foundationalism according to which we have reason to believe in such a metaphysical thesis which is not ultimately grounded in considerations of theoretical unity. Yet this foundationalist strategy is contrary to Lewis's Neurathianism.

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[441] For a similar point see Williamson 2007, 8-9.
[442] On this distinction, see Kriegel 2013, 17, 21. He writes: "Some philosophers…have argued that the super-empirical or theoretical virtues are one and all pragmatic rather than epistemic. By this it is meant that such virtues recommend the virtuous theory for acceptance *as useful*, but not necessarily for acceptance *as true*" (2013, 31).
[443] See Lewis 1986, 116 and Oliver 1996, 3-4 for the view that no aesthetic justification suffices to connect unity with truth.
[444] For discussion, see Kriegel 2013, 17-24.

Lewis appears forced to either abandon his Neurathianism and accept that there is a reason that unity justifies which is not *itself* grounded in unity, or else accept that there is *no* reason for the connection of unity to truth. I believe he takes the latter option, and holds that there is no reason. This means there is no explanation that can be offered for the Truth Principle: for the view that the more unified a theory, the more likely true it is. Lewis can still maintain that unity justifies, but no account of why is given.[445] In particular, no explanation in terms of unity is to be given of why he takes his reductive theory of modality to be more likely true than a primitivist's theory of modality. Support for the view that Lewis takes there to be no justification of the connection between unity and truth is suggested by the following:

> when all is said and done, and all the tricky arguments and distinctions and counterexamples have been discovered, presumably we will still face the question which prices are worth paying, which theories are on balance credible, which are the unacceptably counterintuitive consequences and which are the acceptably counterintuitive ones. On this question we may still differ. And if all is indeed said and done, there will be no hope of discovering still further arguments to settle our differences.

This Neurathian picture of us afloat in the seas of philosophical opinion gives no answer as to why unity justifies; certainly Lewis takes there to be no ultimate answer. Indeed, Lewis, like Quine ultimately appeals to aesthetic reasons (or metaphors) and in the last analysis takes the ultimate 'reasons' we adopt to justify our theories to express matters of taste. He writes that

> Once the menu of well-worked-out theories is before us, philosophy is a matter of opinion….[And latter he writes that even] simplicity is a matter of taste, and simplicity at one place trades off against simplicity elsewhere…[And latter still, discussing intensional and extensional rules, he writes that it] is a matter of taste whether this gain outweighs the waste of using needlessly intensional rules. For me it does.[446]

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[445] DeRosset supports this interpretation. He writes: "His [Lewis's] reductions are not metaphysically motivated. In fact, they are not motivated at all. The methodological principle here seems to be that reduction needs no motivation" (DeRosset 2011, 144).
[446] Lewis 1983, xi, 191, 253.

Even if there is no *reason* to support it, Lewis doesn't take his assessment of what the costs and benefits are to be *arbitrary*. It can he thinks still be reasonable, and Lewis still takes there to be a reasonable project common to philosophers with different tastes:

> [A] reasonable goal for a philosopher is to bring…[our opinions]…into equilibrium. Our common task is to find out what equilibria there are that can withstand examination, but it remains for each of us to come to rest at one or another of them…[447]

It seems that Lewis just cannot fathom what philosophy could be were it not a matter of bringing beliefs into some kind of unity/equilibrium, though he allows *which* equilibrium to be a matter of taste. It is, in my view, this limited view of what different philosophical alternatives might be that is a factor in limiting the appeal of his unity-oriented justification of his theory of modality.

5.5 Assessment

In Chapter 4 I outlined Lewis's attempt to justify his *analysis* of modality. In the current chapter I presented what I take to be Lewis's general justification of his *whole theory* of modality. The justification appears to be that because Lewis's theory reduces modality, and reductive theories best satisfy our theoretical goals, we have a reason to think it is true. I say 'appears to be' because despite placing such a great justificatory burden on it, Lewis says very little in detail about it. An influential strategy of philosophising is introduced, but without sufficient detail to determine whether it is successful, or to guide those who want to implement the strategy.

I argued that not only is more detail required, but that there are several problems with the justification and its assumptions. These problems at least make it questionable whether his justification meets the justification condition, according to which a justification for a theory must provide a reason to think it true (see §1.2).

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[447] Ibid., x.

The three problems I found for his justification are: (a) that it presupposed our beliefs are such that they can coherently be brought together in a single theory. But this requires unities of belief that we do not have good reason to think exist, and for which have some reasons to think do not exist. (b) The second problem was that Lewis's justification requires that we can compare our beliefs to various systematisations of them, and compare systematisations to each other to determine a ranking of theories according to principled determination of costs and benefits. However our beliefs are not readily comparable to theories in the way Lewis requires. Nor can theories be ranked in the desired way, because no guidance is given on how the different costs and benefits can be traded-off with each other. Finally, (c) the third problem was that the justification for Lewis's view of what is a cost and what a benefit is very thin. So we are left without reason to accept a justification of his theory on the lines he provides. Even if we *could* make the relevant comparisons, and declare his theory the best because it is the most unified and conservative theory there is, we would have no reason to take his winning to be a reason to believe it.

These problems cast doubt on Lewis's conception of philosophy as the systematisation of our beliefs. Lewis wants systematising to achieve two seemingly irreconcilable goals: to yield a simple theory of the world which saves a great many of our beliefs, and to use that theory to give an account of the content of our, in this case, modal beliefs. Perhaps a single theory cannot achieve both of these goals at once.

A final point: we have seen in this chapter that Lewis places the burden of justification of his theory on the putative fact that it reduces modal notions taken to be primitive. However in Chapter 3 I argued that there is reason to think that his theory is not in fact reductive. If this is correct, then Lewis has problems whether his justification is itself problematic *or* not. If it is problematic and doesn't justify then we have little reason to believe his theory of modality. If isn't itself problematic, then Lewis is faced with the problem that there are independent grounds to think that it doesn't *apply* to his theory, because his theory doesn't in fact reduce modality.

Chapter 6: Conclusion

In this final chapter I draw several conclusions from the case study which suggest several problems for Modal Reductionism. I first summarise the results of the case study (§6.0), then suggest how the results may be generalised to other similar theories of modality (§6.1). Finally, I suggest an approach to theorising about modality which seems not to be vulnerable to the problems found with Lewis's theory and those similar to it (§6.2).

6.0 Results of the case study

Wilfrid Sellars wrote that

> [d]ifferences with a philosopher of Lewis's stature…almost inevitably concern the basic premises and presuppositions of his argument, rather than its systematic elaboration.[448]

Sellars was speaking of the other Lewis – Clarence Irving – but what he says also holds of ours. I have addressed, in the previous chapters what I take to be some of 'the basic premises and presuppositions' of Lewis's theory of modality, specifically, its ontology, analysis and justification. I found there to be four main problems with his theory, which I now briefly summarise in order of chapter, and connect to the minimal conditions laid out in §1.2.[449]

Chapter 3: Ontology. I argued that because Lewis identifies possibilities with worlds, his ontology must postulate an abundance of worlds, enough worlds in fact to validate his analysis of modality as quantification over them. However, any way he tries to formulate a principle of plenitude to say there is an abundance of worlds, he was found to require irreducible modal notions. So the first conclusion is that

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[448] Sellars 1948, 287-88.
[449] I use lower case Roman numerals to number the conclusions, which I will refer back to in the following section. In these conclusions I refer to the minimal conditions I used to test reductive theories of modality, as laid out in §1.2.

(i) Lewis's theory requires irreducible modal notions, and so appears not to meet the *reduction* condition.

Lewis's favoured way to articulate the abundance of worlds flows from his combinatorial conception of possibility. However, this view is committed to substantial and controversial claims about what is and is not possible. In particular, it agrees with the Humean denial of the existence of necessary connections. As a consequence of this, the second conclusion follows, which is that

(ii) Lewis's theory is revisionary with respect to a significant class of our modal beliefs, so does badly with respect to the *material adequacy* condition.

Chapter 4: Analysis. I examined whether Lewis's conceptual analysis of modality is correct. A good argument to think it is correct would consist solely of conceptual *a priori* truths, linking either side of the analysis. Lewis proposed several such arguments which I analysed and found wanting. I further suggested that because (a) quantification over worlds appears *not* to suffice for understanding modal claims, and (b) that the two sides of his analysis appear to *differ* in their ontological commitments, we can conclude that

(iii) Lewis's theory does not appear to faithfully capture the content of our modal beliefs, and so does badly with respect to the *conceptual adequacy* condition.

Chapter 5: Justification. I examined Lewis's global justification for his theory of modality. His justification is that his theory systematises our modal discourse better than any other theory, where the key test of systematising a discourse is decreasing the number of primitive types of concept we require for expressing it. I argued that there are several problems with his justification, including that not enough is said to see how it works and so not enough is said to constitute a good reason to think Lewis's theory is true. Most importantly, no account is given for why merely decreasing the number of its primitives makes a theory more likely true. I thereby conclude that

(iv) The justification for Lewis's theory of modality appears not to provide a good reason to think it is true, and so it does badly with respect to the *justification* condition.

6.1 Generalisations and their limitations

I

Given the results of the test case outlined above, Lewis's theory appears to fare badly with respect to the minimal conditions. I haven't *shown* those conditions to be reliable, so Lewis's failure to do well with respect to them doesn't *guarantee* that his theory suffers serious problems and is thereby an unpromising candidate reductive theory of modality. What can be said is that *if* doing badly with respect to the conditions is indicative of serious problems, then Lewis's theory is problematic.

Suppose it is agreed that the case study indicates the existence of serious problems for Lewis's theory of modality. What is the meaning of the results of the test case for Modal Reductionism? To answer this question we must go back to the original motivation for using Lewis's theory as a test case for Modal Reductionism (see §1.1). It was selected as such because it (a) is very influential, (b) is widely regarded as the best modal reductionist theory, and (c) is representative of an important class of reductive quantificationist theories, which are the standard way of implementing Modal Reductionism. As I now suggest, each of these reasons provide the basis for generalisations from the conclusions of the test case.

II

(1) The first reason Lewis's theory of modality was selected as a test case for Modal Reductionism was due to the influence it commands. Though few people believe in Lewis's theory, its broadest influence appears to lie in shaping our conception of how such a reductive theory is to be *motivated* and *justified*. This influence touches not only reductive theories of modality, but much other theorising in metaphysics.

Lewis himself justifies his theory of modality largely in terms of the contribution it makes to a more general project of systematising *all* our beliefs into a single unified framework. Reducing modal primitives by analysing them in terms of quantification over worlds is thought to be the royal road to a general systematisation of our beliefs. The evaluative assumption in this justification – that proliferation of primitives is the great sin of theorising – has been widely accepted, as has his methodological holism and its theoretically driven cost-benefit framework of justifying philosophical theories.

Sider's recent book is a good example of the application of Lewis's approach to wide-ranging metaphysical issues, including modality.[450] Just as Lewis posits his worlds, so Sider posits *structure*; and just as Lewis justifies his posits by the work they do in unifying his theory which he shows through their analytic applications, so too Sider takes structure to best unify theory which he shows through *its* analytic applications. He writes

> Posits are most justified when they're unifying…The posit of structure will be justified if its alleged "applications"…are in the end unified by nothing beyond a bare assertion that a single notion of structure plays the needed role in each case.[451]

And, he affirms more generally the Lewisian justification of theories:

> Good theories must be as simple as possible, and part of simplicity is having a minimal ideology…The demand for minimal ideology recalls a familiar trade-off between ontology and ideology.[452]

Though Sider differs with Lewis about *which* concepts to take as primitive, he adopts Lewis's theory driven justification of philosophical theories in terms of the

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[450] Sider 2011
[451] Ibid., 10.
[452] Ibid., 14.

best trade-off of ontology and ideology; both agree that "ideology matters" in this justification.[453]

Conclusion (iv) of the case study appears generalisable to any approach that shares Lewis's justification of philosophical theories. First, any justification which, like Lewis's, see philosophy's role as building a single systematic theory of our beliefs has the problem of resolving what appear to be fundamental inconsistencies in our beliefs – the myth of the three unities – without distorting or radically revising them. Second, detailed guidance is required to determine how trade-offs – primarily of ontology and ideology – are to be assessed. This means detailed *rules*, because of the lack of agreement on how trade-offs are to be correctly made. These rules must encompass how we can measure and compare theories costs and benefits – and so how its primitives and ontology can be measured in the first place – in an effective way. Third, a justification for the given weighting of costs and benefits must be given. Specifically, they must ultimately be tied to truth. Lewis takes excess primitives to be costly because they make a theory less unified, and so less true. But it is often the case that the demand for a reductive and unified theory is not itself justified. Any theory justified in terms of its capacity to reduce primitive ideology, must take a view as to why such reductions make a theory more likely true.

Theories influenced by Lewis's tend to unreflectively work within this methodological framework, without providing it with foundations. If the demands above were met, this form of justification might be workable. As it is, the conclusion (iv) can be generalised to apply to any theory, including any reductive theories of modality, which make use of Lewis's style of justification. If Lewis's justification didn't provide a good reason to think his theory is true, then we should expect similar justifications to suffer similar problems.[454]

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[453] Ibid., vii. See ibid., x, where Sider notes his debts to Lewis. Though Sider shares his general justificatory framework with Lewis, he has a different account of *why* ideology matters, because he takes ideological primitives to stand for structures, and Lewis does not. The problem of ideology is reducible, for Sider, to the problem of ontology, while for Lewis it is not.

[454] For further discussion see Oliver 1996.

III

(2) The second reason Lewis's theory was selected as a test case for Modal Reductionism was that it is commonly regarded as the best candidate reductionist theory of modality available. This is taken to be due, in part, to the strengths of Lewis's theory, and also in part due to the limited availability of plausible alternative reductive theories. Some think that Lewis's is the *only* genuinely reductive theory on the market. Sider, for instance, writes that

> Lewis's analysis of modality is compelling and comprehensive…Hard as they are to accept, *only* Lewisian possible worlds allow a non-circular analysis of possibility and necessity; that is their great advantage…[455]

If you take Lewis's theory to be the *only* plausible candidate reductive theories of modality, then the connection between the results of the test case and Modal Reductionism couldn't be clearer. The results suggest that Lewis's theory is unpromising, and if it is the only plausible modal reductionist theory then Modal Reductionism is itself unpromising. If, however there are other plausible candidates, which I believe to be the correct view, then this conclusion cannot be drawn. How dim the outlook is for Modal Reductionism will then depend on the quality of the rivals to Lewis's theory and their similarity to it. The more other plausible reductive theories of high quality you take there to be, and the less similar they are to Lewis's theory – and so less sensitive to the kind of problems his has – then the less serious will problems for Lewis's theory be to your verdicts on the prospects for Modal Reductionism.

Relatedly, a further reason for those who take Lewis's theory to be the best candidate reductive theory to be less than optimistic about Modal Reductionism, is that Lewis's theory shares a common structure with a number of other reductionist theories of modality, and there is some reason to suggest that it is in virtue of this structure that Lewis's theory suffers the problems it does. If this is so, then this may give us reason to treat other similar theories of modality with caution. I expand on

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[455] Sider 2003, 193, my italics.

this point below, and generalise from the results of the test case to other theories of modality.

IV

(3) The third reason I selected Lewis's theory as a test case for Modal Reductionism is because I take it to be representative of reductive quantificationist theories of modality. Reductive quantificationist theories such as Lewis's share a structure, and it is in virtue of sharing this structure that Lewis's theory can *represent* aspects of these other theories (see §1.1). I now say a little more about what I mean by Reductive Quantificationism conclusions (i), (ii) and (iii) can be generalised to certain theories which are structurally similar to Lewis's. I also clarify exactly how far such generalisations go, by attending to which specific elements of the structure of Lewis's theory allow for which specific generalisations to which specific theories of modality. By suggesting that theories similar to Lewis's suffer some of the same problems as his, a cumulative case against Modal Reductionism is built.

Lewis postulates the existence of worlds, and reductively analyses modality as quantification over them. His theory of modality has the following structure:

> (a) a range of entities are postulated,[456]
> (b) modal notions are to be *reductively* treated in terms of quantification over these entities.

The class of reductive quantificationist theories can be understood as those theories which share this structure.[457] It is important to highlight the structure of these theories because I suggest that the central problems with Lewis's theory of modality are not due to his non-standard ontology of concrete worlds, but are due to structure features of his theory and so potentially applicable to other similar theories. Reductive quantificationist theories agree to the following schematic

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[456] These entities needn't be complete or fully determinate possibilities, and so needn't be possible worlds which I take to be complete (see fn. 19 above). Below I deal with standard theories which take possibilities to be possible worlds and leave aside views according to which possibilities may be incomplete.

[457] It is important to emphasise that I include in this class those theories which *aspire* to reduce modality; whether any of them succeed is open to question, a question this thesis has, I hope, contributed towards answering.

quantificationist analysis of modality: possibly p iff for some possible world w, at w, p; necessarily p iff for every possible world w, at w, p.[458] They differ principally over what kinds of objects possible worlds are identified as, and how *precisely* modality is to be reductively analysed in terms of them. We can divide them into four broad types, according to what kinds of entities they take possible worlds to be: Concretism, Representationism, Abstractionism and Combinatorialism.[459] I now briefly outline these theories, before discussing how conclusions (i)-(iii) of the case study can be generalised.

First, Concretism. Lewis's theory of modality is perhaps the only concretist theory available, and we are by now familiar with it. Suffice it to say that concretists treat possible worlds as maximal concrete objects of some kind, and modality as quantification over them.

Second, Representationism. Representationists take possible worlds to be complete *representations* of some kind. A representation is a content, and contents are often thought to be abstract objects, which is perhaps one reason why Representationism and Abstractionism are often assimilated. But contents are not necessarily abstract, and Representationism is not essentially tied to a view of contents as abstract. Representations may turn out to be reducible to concrete objects without harm to the doctrine.[460]

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[458] For simplicity, I focus here and below on *de dicto* modality.

[459] It may well be that Lewis's theory and his ersatz rivals should be seen as variations on a single theory, and so as closer to each other than even Lewis thought. See Lewis 1986, viii. Also Dunaway 2013, 153.

[460] The traditional ontological categories with which representations are identified are propositions or sentence types. This gives rise to two views about possible worlds, both of which treat possible worlds as set-theoretic constructions. Robert Adams takes the first view, and treats possible worlds as maximal consistent sets of *propositions*, where a set S of propositions is maximal iff for any p, S decides where p or $\neg p$. He aims to "reduce talk about possible worlds to talk about sets of propositions" (Adams 1974, 225; for a similar view see Williamson 2002, 238). Adams accepts that modal discourse is to be analysed in terms of quantification over possible worlds; his identification of possible worlds as sets of propositions is a metaphysical view of what the objects quantified over really are. On his view, to say 'p is possible' is roughly to say that there is a maximal consistent set of propositions which includes p; to say 'p is necessary' is roughly to say that every maximal consistent set of propositions includes p. In this way, modal talk is treated as talk about sets of propositions. Lewis's 'linguistic ersatzist' – whose ideas, according to Lewis, have connections to "Jeffrey, Carnap, Skyrms, and (at one point) Quine" (Lewis 1986, 141-42) – takes the second view and treats possible worlds as maximal consistent sets of *sentences*. The linguistic ersatzist aims to reduce talk about possible worlds to talk about sets of sentences. Identifying possible worlds with sets of sentences allows the linguistic ersatzist to treat modal claims as quantifications over possible worlds, but without introducing commitment to new or controversial entities (ibid., 143). On this view, to say 'p is possible' is roughly to say there is a maximal consistent set of sentences which include a sentence s (or some set of sentences A) which (together) express that p; to say 'p is necessary' is roughly to say every maximal consistent set of sentences includes a sentence s (or some set of sentences A) which (together) express that p. So modal talk is treated as talk about sets of sentences. It turns out that both of the above representationist theories are generally thought to fail as reductive theories of modality. This is primarily due to the difficulty of simultaneously ensuring (a) that every ordinary modal claim can be accounted

The third kind of reductive quantificationist theory is Abstractionism. Abstractionists say possible worlds are complete abstract objects. So some but not all abstractionists are representationists. Kripke is the most prominent non-representationist abstractionist. He writes:

> 'Possible worlds' are total 'ways the world might have been', or states or histories of the entire world.[461]

And discussing his famous dice-model of possible worlds, he writes, distinguishing his view from the concretists and representationists that

> when we talk in school of thirty-six possibilities, in no way do we need to posit that there are some thirty-five other entities, existent in some never-never land, corresponding to the physical object before me. Nor need we ask whether these phantom entities are composed of (phantom) 'counterparts' of the actual individual dice, or are somehow composed of the same individual dice themselves but in 'another dimension'. The thirty-six possibilities, the one that is actual included, are (abstract) states of the dice, not complex physical entities.[462]

What 'ways the world might have been' or 'abstract states' of things *are*, is harder to pin down in Kripke's work, but one common non-representationist line of thinking treats them as complete *properties* of the world.[463]

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for, and (b) defining 'consistency' non-modally. The more complete the theory is, the harder it becomes to define 'consistency' without bringing in modal notions. Having said that, the apparent failure of these theories doesn't mean that a reductive representationist theory is impossible.

[461] Kripke 1980, 18.

[462] Ibid.

[463] But his work has inspired others – notably Plantinga and Stalnaker – who aim to clearer about what these abstract states are. They select *properties* to be the traditional ontological category which these states are. Specifically, properties of the *world*. It is noteworthy that abstractionists have not been successful in reducing modality. Both Plantinga and Stalnaker, the main exponents of Abstractionism, define abstract states in modal terms. Plantinga holds that a possible world is a possible state of affairs. He explains how this is so as follows: one state of affairs S includes another S' iff it is not possible for S to obtain and S' not to obtain. A state of affairs S is maximal iff for every state of affairs S', S includes S' or S precludes S'. A possible world is defined as a maximal possible state of affairs (Plantinga 1978, 44-45). For Stalnaker, a possible world is a compete way the world *might* be, which Stalnaker takes to be a property, and properties he takes to be "understood in terms of what it would be for them to be exemplified" (Stalnaker 2012, 8-11). But while these theories haven't succeeded in reducing modality, nothing appears to rule out the possibility of an abstractionist theory which does.

The fourth kind of reductive quantificationist theory is Combinatorialism. Combinatorialists treat possible worlds as complete combinations of simple objects according to combinatorial principles. Modal discourse, on this view, is to be analysed as quantification over combinations of these entities, where no modal notions are allowed to come into specifying either the simple objects or the combinatorial principles. A combinatorialist theory must answer two questions: (a) what are the simple objects which together constitute possibilities? And (b) what is the combinatorial principle that binds them? Different versions of Combinatorialism may be identified by different answers to these questions. The simple objects may, for instance, be conceived of as concrete objects – e.g., occupied space-time points – or simple representations[464] – e.g., atomic sentences or propositions – or simple abstract objects[465] – e.g., unstructured or atomic properties. These examples illustrate that combinatorialism may intersect with any of the above three theories about what the stuff of possibility is.[466]

V

The first conclusion about Lewis's theory – (i) – states that it requires modal notions in order to express the plenitude of concrete worlds, and so fails the reduction condition. This point may be generalised to all four of the reductive quantificationist theories.

A theory of modality which treats possibilities as entities and modal notions as quantifiers over them, should postulate enough of these entities to account for every possibility. This postulation needed in order to provide a reason to believe that the theory can do the job it is designed for. Such a principle must say not merely that every entity which the theory identifies possibilities with *exists*, but that *every* such

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[464] A representationist Combinatorialism can be found in Quine (1968). For Quine, possible worlds (or, as he puts it, possible world *states*) are combinations of real numbers that represent fundamental physical reality, which is taken, provisionally, to be matter occupying points in space-time.

[465] An abstractionist Combinatorialism can be found in Max Cresswell's theory (1979, esp. 135-56), according to which possible worlds are combinations of "basic particular situations" which are to be thought of rather like the atomic facts of the logical atomists in that a basic particular situation is something which may or may not be present without affecting any other basic particular situation.

[466] Armstrong perhaps straddles the concretist and abstractionist camps, holding that "The simple individuals, properties, and relations may be combined in *all* ways to yield possible [simple] atomic states of affairs, provided only that the form of atomic facts is respected" (1986, 579). Compare to Skyrms 1981.

entity which *could* exist does exist. However, it is hard to see how any such theory can provide a principle of plenitude which doesn't bring in modal notions.

I argued at length that Lewis's concretism must ultimately resort to hidden modality in its principle of plenitude. Representationists and abstractionists don't seem able to do any better. For instance, a linguistic ersatzist must find a way to say that for any possibility, there is a possible world which includes it. This means, for any way the world could be, there is a *consistent* set of sentences which represents it. But given the notion of consistency is irreducibly modal, this approach will not work. An abstractionist might have a principle of plenitude which states that any way the world could be *A*, there is a maximal state of affairs or property *B* which includes it. But this seems to mean that it is not *possible* for *B* to obtain and *A* to not obtain, which of course brings in modality again.

Combinatorial theories appear to fare better. Once the simple objects and principle/s of combination are given, a general view about the range of possible worlds emerges. In order for a combinatorial theory to state the abundance of possible worlds, there must exist sufficient simple objects whose combinations constitute them. And herein lies the problem. Combinatorialism, it is hoped, can be used to state that every possible world exists, without using modal notions. But how is it to state that every possible simple object – of the relevant kinds which build possible worlds – exists, without using modal notions? Without an account of the abundance of simple objects which constitute possible worlds, we won't have explained the abundance of the possible worlds. To illustrate this, consider the situation in which there exists a possible world *w* constituted in part by a possible object *o*. If our theory fails to first postulate *o*, then it cannot postulate *w*, and so it will fail to postulate every possible world. In general, because on this view, possible worlds are constituted by combinations of possible objects, the failure to postulate every possible object will ensure the failure to postulate every possible world. How then can we ensure that a combinatorial theory postulates every possible object? Possibilities, on this approach, are composite objects, and it is this compositeness which combinatorialism exploits to both define possibilities and specify their range. Simple objects, however, are by nature non-composite, and so we cannot appeal to a *further* combinatorial principle to explain *their* abundant existence (and in any case,

such appeals must end somewhere). But it seems that the only other way to go is to use modal notions to say that every possible object exists – and this, of course, undermines the whole point of Combinatorialism as a way to implement Reductive Quantificationism.

It appears then that we can trace the source of conclusion (i) to a structural problem that Lewis shares with other reductive quantificationist theories. They all need to say, in general terms, which possible worlds exist, but they cannot use the modal notions that saying so appears to require. It seems that once a theory defines modality in terms of the existence of a range of objects, saying that an abundance of those objects exists must bring in modal notions. This feature of such theories appears to undermine their claim to be reductive. This generalisation doesn't apply to *all* modal reductionist theories, because not all of them share the structure of reductive quantificationism that seems to permit it. There are reductive theories of modality which do not define modality in terms of a range of objects, and so these theories do not have to postulate a plenitude of possible worlds, and so do not suffer from problems associated with doing so in a reductive framework (see §6.2 for a brief discussion).

VI

I now suggest that conclusion (ii) generalises to *Combinatorialism* of any form. The second conclusion stated that Lewis's theory does poorly on the criteria of material adequacy. Combinatorialism yields a Humean picture of what is possible, in that it denies the existence of necessary connections between distinct objects. According to combinatorialism, every modal fact emerges from non-modal principles applying to non-modal simple objects. So there are no brute non-combinatorial modal facts written into the combinatorialist framework (for instance, in the specification of the principle or the simple objects). Given the objects are simple and without parts, nothing 'inner' to the objects prevent any object co-existing with any other; given the combinatorial principle is non-modal, there is no 'outer' modal force preventing or compelling the combination of simple objects, such as metaphysical laws or relations. Given there are no other brute modal facts, nothing prevents any object existing (or not existing) with any other. Indeed, the whole point of the

combinatorialist appeal to simple objects is that because of their simplicity they cannot conflict with or require one another. Out of this, a *logical* picture of modality emerges, according to which the only combinations which are strictly prohibited are logically impossible, and the only combinations which are necessary are logically necessary.

There are two problems with this Humean picture. First, it is arguable that an account of what possibilities *are* should be neutral with respect to *substantial* questions of what is and is not possible. Combinatorialism is not neutral, and brings with it substantial and controversial views about what is and is not possible. The related second problem is that by making these Humean commitments to what is and isn't possible, reductive combinatorial theories appear to be materially inadequate. For (a) a range of ordinary modal beliefs are undermined, because there is an over-generation of possibilities with respect to them. We ordinarily take there to be at least some necessities other than logical necessities; the 'broadly logical' or 'metaphysical necessities'. Yet for any such putative necessity, there is a weaker logical possibility in which it fails to hold. The Humean view cannot account for our beliefs in such modal claims, and must deny them. (b) The theory forces commitment to a range of modal beliefs about which we are as yet undecided, some of which are philosophically controversial. Take for instance the possibility of nothing. I take there to be no consensus about this possibility, yet the combinatorialist must deny it. Lewis and Armstrong are the two most prominent combinatorialists, and both agree on this question. About this Lewis writes (without labelling his own theory 'combinatorialist'):

> I find it pleasing that another view, the one I like second best after my own, also seems to make it come out necessary that there is something rather than nothing. This is the 'combinatorial' view: in place of other worlds, we have constructions in which the elements of this world – elementary particulars and universals, perhaps – are put together in different combinations…But as D. M. Armstrong has noted in discussion, there is no way to combine elements and

make nothing at all. So there is no combinatorial possibility that there might be nothing.[467]

The combinatorialist understands possible worlds to be combinations of simple objects and every possibility to belong to some possible world. So wherever there is a possibility, there is a something, and no something can be identical to the possibility of nothing. Thus combinatorialism seems to takes the possibility of nothing to be contradictory, and so logically impossible. This means no combinatorialist can adequately account for the possibility of nothing, and so must deny it. Yet we may feel that a theory of possibility ought to be neutral on such meaty philosophical doctrines.[468] It seems to make little difference if we take the simple objects possible worlds are built from to be abstract objects or representations – to the extent to which such views could be coherent and reductive, the same Humean conception of possibility would appear to result, and the same kind of problems for material adequacy would follow.

VII

I now suggest that conclusion (iii) may generalise to any *quantificationist* theory of modality, including *reductive* quantificationist theories.[469] The third conclusion was that Lewis's theory does not faithfully capture the conceptual content of modal discourse. We would do well not attributing this to idiosyncratic features of Lewis's model of modal reality, such as the *concreteness* of his worlds, but rather find fault with his theory's structure, in particular its quantificationist core. The reason for this is twofold.

(1) We appear not to understand modality via quantification over possible worlds. Treating our understanding of modality as quantification over possible worlds both

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[467] Lewis 1986, 74 fn. 53.

[468] It is interesting in this respect that that the combinatorialist does appear to require, seemingly contrary to its motivation, some brute necessities. It is as if the theory displaces the necessity in necessary *connections between* things, to the necessity *of* certain things which form the explanatory framework of modality, such as, e.g., worlds or propositions.

[469] In virtue of applying generally to quantificationist theories, the following generalisation thereby applies to *reductive* quantificationist theories. The generalisation does not apply to *non*-quantificationist reductive theories of modality.

attributes to us understanding of claims we intuitively do *not* understand and appears to fail to attribute to us understanding of claims we intuitively *do* understand. This is most clearly seen through problems of embedding modal propositions in various contexts. Take for instance, the explanatory context of the 'Euthyphronic Dilemma' – 'is *p* necessary because it is true in every possible world, or is it true in every possible world because it is necessary?' This question is trivialised by Lewis's theory and any other quantificationist theory. Consider, for example, the theory that possible worlds are consistent sets of propositions. The dilemma is then equivalent to: 'is *p* true at every consistent set of propositions because it is true at every consistent set of propositions, or is *p* true at every consistent set of propositions because it is true at every consistent set of propositions?' By trivialising such obviously sensible questions, Quantificationism displays its inability to makes sense of our modal thoughts, and this suggests that our understanding of modal notions is independent of our understanding of quantification over possible worlds. This casts doubt on the idea that understanding a modal claim *just is* understanding an associated quantificational claim.

Another example which illustrates this problem is Kripke's Humphrey Objection. It is, in my view, the point of the Humphrey Objection to bring out the fact that Lewis's analysis gets wrong our understanding of expectations, hopes, concerns etc., about that which might or must be. I believe the point can be extended to any quantificationist theory – such theories appear to fail to make sense of such propositional attitudes which take modal propositions as objects. Take for instance the possibility that the earth warms and the seas rise. We care about whether this might happen, but if our understanding of the possibility, as per the quantificationist, runs via the proposition asserting the existence of a possible world at which the earth warms and the seas rise, it seems our worry concerns the existence of that possible world. Perhaps, rationally, we *should* worry about the existence that possible world. But given that we *don't* worry about the existence of that possible world, we can use this fact as evidence for the view that our understanding of modality does *not* go via our understanding of the possible world analysis.

Not only do our modal intuitions fail to validate the quantificationist view of our understanding of modality, but the quantificationist view fails to make sense of our

practices. For if such a theory cannot, for instance, make sense of why someone might be worried about the possibility of the earth warming and seas rising, it seems unable to help in rationalising actions that are based upon it. According to quantificationist theories, the worry is to be understood as the worry that there is a possible world in which the earth in fact warms and the seas in fact rise. But this view fails to make sense of why we have the worry we do. Why would the existence of a possible world – a combination of simple objects, a representation, an abstract state of the world or a concrete world – at which the sea rises give me a reason to worry that the *actual* seas could rise? If there is no plausible account of this, then it seems there is little hope in rationalising actions based on the worry

Connectedly, (2) the quantificationist requires that our modal discourse is ontologically committed to a range of possibilities, but we don't *take* ourselves to be saying anything that is so committed. We ordinarily do not take ourselves to be quantifying over possibilities when we say that something is possibly so. But if a discourse is uncommitting it is not quantificational. Of course it may be that we are wrong about what we say, and that what we *really* say is not what we *think* we say. But before we are committed to a particular theory of modality, the evidence from what we take ourselves to say is to be taken seriously, and counts against a theory which denies it. If a theory is to deny it then it bears the cost that a range of our beliefs about what we believe and what we mean are wrong. Given the revision such a theory must make to our beliefs about what we say, it is questionable that such a theory is merely giving a conceptual analysis of what is said. It may well be that models can be provided for modal discourse which allow modal claims to be 'translated' in quantificationist terms. But the reason the conceptual adequacy condition was introduced reflected the idea that we want more from a conceptual analysis of modality than a model – we want an analysis of what it is we say and think modally. As such, our intuitions about what we mean seem to be massively important evidence for or against a conceptual analysis and cannot easily, if at all, be brushed aside. Indeed it is hard to think of how else we can decide what it is that we mean than by consulting our intuitions.

VIII

In summary of the main points above, I suggested three routes to make trouble for Modal Reductionism on the basis of the test case. The first was based on the influence Lewis's theory wields, the second based on its high regard, and the third based on its structural similarity to other theories.

 I suggested conclusion-specific generalisations from Lewis's theory to specific other theories. Conclusion (i) is, I argued, generalisable to other *reductive quantificationist* theories of modality, conclusion (ii) to other *combinatorial* theories of modality, conclusion (iii) to other *quantificationist* theories of modality, and conclusion (iv) to theories which are justified in terms of reducing primitive ideology in the manner of Lewis.

Together, the conclusions suggest a tentative cumulative case building against reductive quantificationist theories of modality. Given that Reductive Quantificationism is an important way to implement Modal Reductionism, these results appear to show there are problems for Modal Reductionism. However, given that there are reductive theories which escape the reach of my generalisations, more research needs to be done to strengthen this conclusion.

6.2 Modal Primitivism

I

I have made the case for the view that Lewis's reductive theory of modality has several problems which appear to generalise to a range of similar theories. This provides some reason to be sceptical of the reductive approach to modality. I want to stress however, before outlining what I take to be the more promising approach of Modal Primitivism, that there *are* reductive theories of modality that my critique of Lewis's theory and those similar to it hasn't touched, and they remain serious candidate theories.

The two central views reduce modality to either *knowledge* or *meaning*, and so treat modality as a notion belonging to epistemology or semantics. The first doctrine arose in the rationalist tradition – in the form: modality is *apriority* – and was the pre-Kripkean orthodoxy. The second doctrine arose in the empiricist tradition – in the form: modality is *analyticity* – and was influential particularly in the first half of the last century. Both doctrines currently have prominent supporters. Hossack, for instance, supports the first view and treats necessity as *apriority*. He supports the analysis of modality in terms of the conditional and negation: a proposition is necessary if a contradiction *would* be true *were* it false. He then analyses the conditional in terms of *a priori* inferriblity: a true conditional is one whose consequent is inferrible *a priori* from the antecedent and 'relevant conditions', where these are understood in terms of "relative closeness of propositions to actuality".[470] Alan Sidelle is a supporter of the second view. He divides the content of modal claims into non-modal synthetic truths and trivial analytic truths, and takes the source of necessity to be located in the analytic truths, which he treats as true in virtue of linguistic conventions. So for Sidelle "all necessity is grounded in our conventions".[471]

It is because these reductions don't see modality as an *ontological* notion that they don't appear to be vulnerable to the problems that affect Lewis's and similar theories. Given that modality is not defined in terms of objects, no criticism along the lines of 'modality is required to postulate enough objects' applies. For the same reason, the criticism along the lines of 'modal notions are not ontologically committing, whereas the quantifier is ontologically committing' doesn't apply to them. Nor does the criticism along the lines of 'the reduction is justified in terms of an exchange of entities for ideology,' for there *are* no new entities postulated, and so such justification is inapplicable to such theories. Neither theory seems immediately vulnerable to the objections laid out this thesis, and both are worthy of serious attention. Having said that, I believe that the results of this thesis also motivate taking non-reductive theories of modality more seriously. As Modal Primitivism is the only serious alternative to Modal Reductionism, it is to this approach I now turn.

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[470] Hossack, forthcoming.
[471] Sidelle 1989, xi.

II

Modal Primitivism is often not taken seriously. This attitude is best exemplified by Lewis's view that treating modality as primitive is "not an alternative theory at all, but an abstinence from theorising".[472] This view is, I believe, incorrect; it presupposes that the only possible analysis of a notion is a *reductive* analysis, and I see no reason to believe that. Modal Primitivism is the view that, contra Modal Reductionism, modal notions should be recognised as irreducible.

One reason given *not* to be a modal primitivist is based on the Lewisian views that modal primitives should be avoided at all costs – even at the cost of introducing entities no one (yet) believes in – and that a theory of modality is always better without them. But if the problems with these views outlined in Chapter 5 are correct, then a major obstacle to taking Modal Primitivism seriously is removed, and it emerges as a viable approach to modality.[473] A second reason given *not* to be a modal primitivist is the thought that a reductive alternative is, or will, be available. If the problems with Modal Reductionism developed in this thesis are correct, then all the more should we take Modal Primitivism – the only real alternative to Modal Reductionism – seriously.

There are a number of different versions of Modal Primitivism, and some of them appear to escape some problems which dog Lewis's and similar theories. To see this, I distinguish between two very general forms of Modal Primitivism: Metaphysical Primitivism and Semantic Primitivism. Metaphysical Primitivism is the view that irreducible modal notions are required to explain the source of modal *truth*, while Semantic Primitivism is the view that irreducible modal notions are required to make sense of the *meaning* of our modal claims.[474]

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[472] Lewis 1973, 85.
[473] It is worth noting that Modal Primitivism isn't tied to a particular conception of what justifies it. A modal primitivist may, for instance, adopt the same cost-benefit view of justifying theories as Lewis, but believe that taking modality as primitive is the most effective way of keeping down the total number of types of primitive notions our theory of the world requires.
[474] Metaphysical and Semantic Primitivisms are not mutually exclusive. Nothing prevents a modal primitivist theory giving a unified account of the source and meaning of modality, just as Lewis himself tried to do. There is however no reason for a modal primitivist to think that a single theory will answer both questions at once. On this see Menzel 1990, 384-85.

III

I argued in the previous section that one of the problems that dogged Lewis's and similar theories is that they must ultimately make appeal to irreducible modal notions in giving an account of the range of possible worlds. One of the virtues of Metaphysical Primitivism is that it embraces the use of irreducible modality in the characterisation of logical space. This means that Metaphysical Primitivism is liberated from two orthodox reductionist views. The first is that modal truth is ultimately explained in terms of non-modal entities. Metaphysical Primitivism makes room for a range of other plausible candidate answers. For instance, the view that there are some brute irreducibly modal facts. On this view, modal truths are not explained in terms of irreducibly modal objects, but in terms of irreducibly modal facts. Another answer that Metaphysical Primitivism makes room for is the view that modal truth is explained in terms of irreducibly modal objects.[475] I take Hale's theory of the source of modality to be a form of Metaphysical Primitivism. He takes the source of modal truth to lie in the essence of things, and takes the notion of essence to be an irreducibly modal notion.[476] So on this view, this explanation of modal truth in terms of essence is not a reduction. One of the advantages of Metaphysical Primitivism as compared to Lewis's reductive theory is that by appealing to facts or objects characterised in essentially modal terms, modal truth appears to be explicable in terms of what actually exists, and so is compatible with the view that the actual world and the objects therein are everything that exists. Lewis's Modal Realism, by contrast, denies that the actual world is all there is. We might think of this commitment to other worlds as the natural outcome of both denying the ontological richness of the actual world (which may include objects or facts defined in irreducibly modal terms) whilst wanting to honour the facts of modality.

The second orthodox reductionist view Metaphysical Primitivism appears to liberate us from is that the entities in terms of which modality is defined are fully determinate possible worlds. The orthodox view is that incomplete possibilities are to be understood only in terms of fully determinate possibilities which are identified

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[475] For a discussion of some recent proposals along these lines see Vetter 2011.
[476] Hale 2013, 63 fn.1.

with an object which possesses a clear criterion of identity, such as a fusion or set, which can be specified without modal notions. By making appeal to irreducible modal notions legitimate, the metaphysical primitivist makes room for thinking of possibilities as incomplete and not essentially tied to entities which are fully determinate. So, for instance, we may think of possibilities as ways things could be, without thinking of those ways as answering every question as to how the *rest* of the world might be.

Turning now to Semantic Primitivism, one of the problems that dogged Lewis's theory was its difficulty making sense of our modal thoughts in anything like the way in which *we* make sense of them. In short, its interpretation of modality is alienating: *we* don't think we say what *it* says we say. I am not of course suggesting that we are able to say precisely what our modal claims are about; if we could, we would have no need to theorise. Rather (a) we have intuitions about what our modal thoughts are *not* about, such as that they clearly seem not to be about worlds and entities therein,[477] and (b) our explanations of our modal thoughts typically involve *other* modal thoughts. For instance, we might explain the necessity of a proposition *p* in terms of the counterfactual: *p* would remain true whatever else were the case. I take an advantage of Semantic Primitivism to be that it allows for the development of accounts of the content of our modal thought or discourse in the very modal terms which we ordinarily think or express them. That is, in terms which respect rather than alienate us from the modal thoughts we aim to give an account of. It can do so because it provides us unashamed access to the modal vocabulary and modal distinctions in terms of which we ordinarily think and express our thoughts. Further, Modal Primitivism provides for the move from possible worlds to incomplete possibilities at the semantic level as well as at the metaphysical level. And indeed, incomplete possibilities seem much closer to what our ordinary modal thought is about than possible worlds. It seems then that Modal Primitivism provides a promising approach to of accounting for the place of modality in our thoughts such that we can recognise those thoughts as our own.

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[477] This Moorean view need not imply that we have a complete reflective understanding of the contents of our thoughts. We may, for instance, be able to determine when a report of what we say or think goes *wrong*, even if we cannot say precisely what its content is.

As I noted at the beginning of this thesis, Ramsey said that

> Philosophy must be of some use and we must take it seriously; it must clear our thoughts and so our actions….[478]

Our thoughts may be cleared by being *cleared away* or they may be cleared by it being *made clear* what our thoughts are. I have investigated Lewis's theory in which I hope to have highlighted the productive tension between these two ways of clearing our thoughts. There are significant dangers in clearing *away* our thoughts, and 'improving' them, and so 'improving' our actions too. 'Improvement' tends to have its own metric and its own logic, and without serious reflection on its purpose and ethics, we run the risk of 'improving' our philosophy and our actions, but losing a grip on the content of our thoughts, and so of ourselves.

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[478] Ramsey 1990, 1.

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