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August 2018

All The Small Things: Contingent Mereological Nihilism

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Abstract

Scientists and metaphysicians alike often accept that the best theory is that which best exhibits familiar theoretical virtues such as empirical testability, fruitfulness, conservatism, explanatory power, and parsimony. In this dissertation, I assume this naturalistically respectable methodology and explore whether it can help decide between competing metaphysical theories. I argue it can.

In chapter 1, I present my version of mereological nihilism, Minimal Truthmaker Nihilism (MTN). According to MTN, only the minimal truthmakers for all true sentences are included in the correct ontology and composite objects are not among the minimal truthmakers. I argue that the proponent of MTN can claim 'hands exist' is true, even though hands don't really exist. In chapter 2, I argue we can use the theoretical virtues to answer the Special Composition question (SCQ), which asks what the necessary and jointly sufficient conditions are under which two or more objects come together to compose a further object. The first four virtues don't give us any reason to prefer one theory of composition over another. But, I argue, on any plausible understanding of parsimony we have reason to prefer MTN, according to which two or more objects never *really* compose a further object. Suppose I'm right about that. It's metaphysical orthodoxy that true metaphysical theories, such as MTN, are *necessarily* true. Against this orthodoxy -- using the same commonly accepted methodology -- I show that MTN is *contingently* true.

In chapter 3, I argue for what I'll call the 'Nomological Account of Objecthood' or 'NAO' for short. If I'm right, NAO gives us answers to the SCQ and the Simple Question, which asks what the necessary and jointly sufficient conditions are for being a simple. I argue that if we

assume the aforementioned methodology and that simples are possibly extended, then NAO is the best theory of objecthood.

In chapter 4, I show how we can put Minimal Truthmaker Nihilism (MTN), to work for us. There is a long-standing problem of how it is that mental properties can cause physical events given that it is widely accepted in the scientific community that every physical event has a sufficient completely physical cause. MTN solves this problem by explaining how microphysical properties and objects located in space-time alone can serve as truth-makers for sentences about the causality of mental properties just as, I argue, microphysical properties and objects can serve as truth-makers for sentences about composite objects such as tables.

Each chapter in the dissertation is written as a stand-alone paper.

All The Small Things:

Contingent Mereological Nihilism

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B.A., Cornell University, 2010

DISSERTATION

Submitted in partial fulfillment of the requirements for the degree of

Doctor of Philosophy in Philosophy

Syracuse University

August 2018

Acknowledgements

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Introduction

When do two or more objects compose a further object and what is composition? Peter Van Inwagen (1990) dubbed the first question the Special Composition Question (SCQ) and the second question the General Composition Question. While the first demands that one provide the circumstances under which composition takes place, the second demands that one provide a reductive analysis of composition that does not use mereological terms. There are three possible answers to the special composition question: mereological nihilism which states that two or more objects never compose a further object, mereological restrictivism which states that two or more objects compose a third object under some circumstances but not others, and mereological universalism which states that two or more objects always compose a further object. Notable mereological nihilists include Ted Sider (2013), Ross Cameron (2010), and Terrance Horgan and Matjaz Potrč (2008). Van Inwagen (1990) argues that things only compose a further thing when they are caught up in a life, Trenton Merricks (2001) argues that things compose a further thing when that further thing has an emergent causal property, and Ned Markosian (1998) argues that whether or not some things compose a further thing is a brute fact. Mark Heller (1990), David Lewis (1991), Ted Sider (2001) defend mereological universalism, as does Jonathan Schaffer (2009) more recently.

In my dissertation I'll argue for a version of mereological nihilism, Minimal Truthmaker Nihilism (MTN). According to MTN, only the minimal truthmakers for all true sentences are included in the correct ontology and composite objects are not among the minimal truthmakers. Minimal truthmakers do not have proper parts. So, while 'tables exist' is true; tables are not among the minimal truthmakers for the claim 'tables exist'. Therefore, in claiming 'there are tables', one is not ontologically committed to tables. I will argue that the minimal truthmaker

version of mereological nihilism is the best theory of composition since the theory is internally consistent, it is consistent with empirical facts, and compared to the other theories of composition, mereological nihilism is more explanatorily powerful and parsimonious.

Before presenting my positive argument for my version of mereological nihilism in chapter 2, in chapter 1, 'Baby, Talk is Cheap, but Ontology is Not', I respond to some common objections to mereological nihilism and present my version of mereological nihilism, MTN. In his paper "On What Grounds What", Schaffer explains that a sentence commands "Moorean certainty" when that sentence is "more credible than any philosopher's argument to the contrary" (2009, p. 357). A common objection to mereological nihilism is that it is a Moorean fact that I have two hands and therefore it is a Moorean fact that hands exist. If mereological nihilism is true, then hands don't exist. I know better that I have hands than I know the premises of any argument for nihilism. Therefore, I have most reason to reject nihilism and accept that I have hands. Whatever strength this objection may have against some versions of nihilism, it does not hold any force against the kind of nihilism that I am defending. According to MTN, in ordinary circumstances 'I have two hands' is true.

Another objection to mereological nihilism is as follows: We have two pieces of evidence that tell in favor of our ontological commitment to ordinary objects. The first is that we are able to communicate about ordinary objects and the second is that we perceive ordinary objects. The existence of ordinary objects explains why it is that we can successfully communicate about them and why we all perceive these ordinary objects. I will reply to this objection by showing how the proponent of MTN can explain the two pieces of evidence. In which case, our ability to communicate about ordinary objects and our perception of ordinary objects does not tell in favor of our ontological commitment to ordinary objects over mereological nihilism.

After heading off these common objections, I present a couple of ways the proponent of MTN can consistently claim 'hands exist, but hands don't really exist'. First, I present Amie Thomasson's (2010) hybrid theory of reference and explain how her theory of reference determines meaning. I'll then present Cameron's (2010) view according to which the existential quantifier that is used in English is not the existential quantifier that we ought to use to do metaphysics. Cameron argues that the meaning of the existential quantifier in English is partly determined by the use of existential language. The use of the terms 'there is' and 'there are' and 'exists' should not be considered when we are doing ontology. Instead, we should stipulate an artificial quantifier whose meaning is only determined by the structure of the world. Cameron call's the stipulated quantifier the 'ontological quantifier'. The meaning of the ontological quantifier is independent of the meaning of the English existential quantifier whose meaning is partly determined by the use of the quantifier in English. I will then show how Thomosson's semantic theory can be combined with Cameron's (2010) ontological quantifier to yield a consistent version of MTN. Next, I'll present Horgan and Potrč's (2008) indirect correspondence and contextualism and explain how their theory also yields a consistent version of MTN.

I'll remain neutral between the Thomasson-Cameron style MT-Nihilist and the Horgan and Potrč style MT-Nihilist. I briefly explain that as long as a semantic theory isn't committed to a one-to-one correspondence from a term or predicate to an object or property, respectively, then that semantic theory is consistent with MTN. I'll also explain that, at least prima facie, the kind of semantic theory that has this kind of ontological commitment attached to it is implausible.

In chapter 2, 'Nihilism, but Not Necessarily', I use the theoretical virtues to decide between theories of material composition, i.e., theories that tell us when two objects compose a further object. If we accept that our ordinary sentences are made true by objects not mentioned in those sentences, I show that four of the theoretical virtues don't provide any reason to prefer one theory of composition over another at this world. But, I argue, on any plausible understanding of parsimony we have reason to prefer mereological nihilism, according to which two or more objects never come together to comprise a further object.

Suppose I'm right about that. It's metaphysical orthodoxy that true metaphysical theories, such as mereological nihilism, are necessarily true. Against this orthodoxy and using the same commonly accepted methodology, I show that mereological nihilism is merely contingently true. I argue that while in the actual world there's reason to prefer mereological nihilism, there are two kinds of possible worlds at which there's reason to accept an alternative theory of composition. The first kind of world is a gunky world, i.e., a world where every object has two or more parts. The second kind of world is one with emergent properties, i.e., properties that cannot be reduced to the properties of their parts. If either kind of world is possible, then, I argue, theories of composition can be true without being necessarily true. Moreover, I show that we don't have reason to think that gunky worlds are impossible. This is because the theoretical virtues that seem to tell in favor of the impossibility of gunky worlds, when uniformly applied, in fact tell in favor of the possibility of gunky worlds.

In chapter 3, 'Objects and Simples: The Nomological Account' I address what I'll call the 'Object Question': What are the necessary and jointly sufficient conditions for being a physical object? In this chapter I'll argue for what I'll call the 'Nomological Account of Objecthood' or

'NAO' for short. If I'm right, NAO answers the SCQ and the Simple Question (SQ), which asks what the necessary and jointly sufficient conditions are for being a simple.

I argue that given the possibility of extended objects and barring the possibility of gunky worlds without emergent properties, NAO is the best account of objects. I pose a puzzle for the proponent of NAO regarding the possibility of gunky worlds without emergent properties. I then offer two responses the proponent of NAO might give in light of this puzzle.

In chapter 4, 'The Dissolution of the Problem of Exclusion', I show how MTN can be applied to dissolve the long-standing problem in philosophy of mind. It is common coin that the mental property of desiring a sip of water can cause certain physical events such as walking to a water fountain. What's puzzling is how this causation is possible. How is it that mental properties, e.g., desiring water, can cause physical events, e.g., your walking to a water fountain? The problem of mental causation is especially difficult given that it is widely accepted in the scientific community that every physical event has a sufficient completely microphysical cause. I show that MTN can make sense of our common beliefs about the causality of our mental states. Here, briefly, is how: There are true sentences that include the term 'biological property' that attribute causal powers to those biological properties. Those sentences are made true by microphysical objects and properties arranged in certain ways in space-time, whether or not it is possible to give a paraphrase in terms of the microphysical. These objects don't have two or more parts and their properties are fundamental physical properties like charge or spin. If we apply the same strategy to sentences that include mental property terms like 'pain,' then we get a solution to the problem of mental causation. I argue that given how terms and predicates apply to different arrangements of particles and properties in space time, it is true to say that certain events, like desiring a sip of water, are mental qua having certain properties that can correctly be called mental properties.

My solution to the problem of mental causation is strikingly different to the solutions currently on offer in the literature in two ways. First, my solution embraces the fact that the causality of the higher order properties, such as biological and chemical properties, and mental properties, such as desirings, share the same fate. If mental properties are not causal because they overdetermine the causal powers of microphysical properties, then higher order properties are not causal for the same reason. Second, my solution doesn't require a reductionist project according to which all facts about the mental can be paraphrased in terms of the microphysical. Instead, all that is required is that microphysical objects and properties make-true true sentences about the mental.

Chapter 1

Baby, Talk is Cheap, but Ontology is Not

1.1 The Moorean Objection

In "On What Grounds What", Schaffer explains, a sentence commands "Moorean certainty" when it's "more credible than any philosopher's argument to the contrary" (2009, p. 357). A common objection to mereological nihilism, henceforth nihilism, is that it's a Moorean fact that I have two hands and therefore it's a Moorean fact that hands exist. If nihilism is true, then hands don't *really* exist. I'm more certain I have hands than I am of the premises of any argument for nihilism. Therefore, I have most reason to reject nihilism and accept that I have hands. So, the objection goes. However, I say, even if we accept as a starting point that 'I have hands' is a Moorean fact, it isn't a Moorean fact that there are *really* hands.[1] The main aim of this paper will be making clear the distinction between Moorean intuitions about what exists versus intuitions about what *really* exists.

One might understand the Moorean as claiming that the common-sense knowledge of a sentence that expresses a Moorean intuition (henceforth, a Moorean sentence) is more justified than the premises of an argument against a Moorean sentence. A sentence's being commonsensical just makes that sentence justified to a high degree. Instead, one might offer the following objection. When measuring the explanatory power of a theory, a piece of data that ought to be explained is our common-sense beliefs. If one theory can claim that our common-sense beliefs are true while another theory cannot, then the first theory has more explanatory power than the second theory and so we have some reason to believe the first theory over the

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[1] At the end of the paper I respond to a second version of the Moorean intuition according to which it is a Moorean intuition that hands *really* exist.

second. Since nihilism cannot allow that our common-sense beliefs are true, this counts as a strike against the explanatory power of nihilism. However, whatever strength these two objections may have against some versions of nihilism, I'll argue neither holds any force against the kind of nihilism I'm defending, henceforth Minimal Truthmaker Nihilism (MTN).

Talk of hands is true in ordinary contexts according to the kind of nihilism I'm defending. For instance, 'I have two hands' is true. But, I claim, hands don't *really* exist. Henceforth, I'll use **boldface** to mark that I am discussing objects that *really* exist and not just talk of objects that are supposed to correspond to objects that *really* exist. So, the claim 'hands don't *really* exist' is equivalent to '**hands** don't exist'. The objects that *really* exist are the objects in the correct ontology. In sections 3 and 4, I offer two ways to make the distinction between talk of objects that exist and objects that *really* exist. According to MTN, the only objects that *really* exist, the only objects in the correct ontology, are the minimal truthmakers for all true sentences that need truthmakers. The only objects I'm ontologically committed to are the objects that act as minimal truthmakers for all true sentences that require truthmakers. So, while 'I have two hands' is true, the minimal truthmakers for that sentence could be **particles** located in **space-time.** Alternatively, the minimal truthmakers could be **properties** located in **space-time** or both **properties** and **particles** located in **space-time.** Hands are not minimal truthmakers on any of these options, so the truth of the aforementioned sentence doesn't ontologically commit me to **hands**. To clarify, the truth of 'I have two hands' commits me to the existence of hands, but it doesn't commit me to the *real* existence of hands. I accept that for 'I have hands' to be true in English, there must be hands that exist. I reject that for 'I have hands' to be true in English, **hands** must exist.

I'll now consider two objections to my claim that while many ordinary sentences are true, the only objects in the correct ontology are the minimal truthmakers for all true sentences that require truthmakers.

First, one might use plural identification to claim that any specific hand will be plurally identical to some arrangement of fundamental objects and/or properties. In which case, if I list all of the minimal truthmakers I need not also list things like hands as they are plurally identical to some plurality of minimal truthmakers that I have already admitted into my ontology. In which case, given that the aforementioned particles *really* exist and are plurally identical to a specific hand, then that specific hand also *really* exists. On this view *real* existence is closed under entailment. In addition, since we, given human abilities, cannot perceive or individuate simples, in order to talk at all we must talk about ordinary objects like hands and tables. Given that hands, and other ordinary objects, really exist and we need to talk about ordinary objects to communicate, the MT-Nihilist should just admit hands and other ordinary objects into her ontology. The thought is that given that admitting ordinary objects that are plurally identifiable with fundamental objects and/or properties comes at no ontological cost and we need to talk about ordinary objects, there is no reason not to admit ordinary objects into our ontology and there is some benefit in being able to claim that the things that we intuitively think exist also *really* exist.[2]

The problem with this kind of view is that if we actually plurally identify a specific hand with a specific plurality of fundamental objects and/or properties, then when the hand loses or gains fundamental objects and/or properties the aforementioned hand seems to go out of

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[2] Thanks to André Gallois for pointing out this sort of view.

existence. Plural identification does not seem to be mereologically flexible. If a hand just is an arrangement of particles, then when that hand loses a particle, which it inevitably will, that hand goes out of *real* existence and a new hand comes into *real* existence. But, if hands are so ontologically fragile that particle losses and gains cause hands to go in and out of existence, then the English term does not map onto the ontologically fragile hand (hereafter hand*) that is plurally identified with the fundamental objects and/or properties. The way we use the term 'hand' entails that the hands we speak of can gain and lose parts while remaining the same hand. The kind of thing that could be plurally identified with a specific set of fundamental objects and/or properties cannot gain and lose parts while remaining the same thing. In which case, the hands we speak of are not the hands* that can be plurally identified with fundamental objects and/or properties. So, there is no benefit in plurally identifying arrangements of fundamental objects and/or properties with ontologically fragile things like hands*. Ontologically fragile things like hands* are not the things that we talk about or intuitively think exist.

Second, one may object to MTN in the following manner: we can reliably communicate using words like 'hands' and 'tables', this is evidence that there are **hands** and **tables** that correspond to our talk of hands and tables and not just truthmakers for true sentences that include the terms 'hands' and 'tables'. In addition, our direct perception of hands and tables justifies our ontological commitment to **hands** and **tables**.

Our ability to communicate using the words 'hands' and 'tables' is not evidence that **hands** and **tables** ought to be included in one's ontology, rather it's evidence that there is something in the world that a) corresponds to our perceptions such that our perceptions are veridical and b) makes-true 'hand'-talk and 'table'-talk. In cases where we aren't hallucinating or dreaming, perceptible patterns aren't illusory, and other defeaters aren't present, we're justified in thinking

that there is a correspondence between perceived patterns and objects in the world such that

we're *warranted* in applying the terms we've learned to apply when we perceive a certain

pattern. If the world is some way such that the conditions of application for a term are fulfilled,

then we can *correctly* apply the term.[3] When we see some patterns, we have learned that we can

usually correctly apply the term 'hand' and when we see other patterns we have learned that we

can usually correctly apply the term 'table'.

However, it needn't be the case that for every perceived pattern in the world that we can talk

about that there is *really* a single thing in the world that corresponds to the aforementioned

pattern. In fact, we have reason to believe that some of the patterns that we perceive as individual

things correspond to what are *really* many things working together. For example, we have good

reason to believe that when we perceive a house pattern, the house pattern corresponds to what

are *really* such small particles that the human eye cannot perceive them individually. Our

language is such that as long as the world corresponds to our sentences, our sentences turn out

true. As long as we are all using similar enough general rules to talk about the world as we find

it, we will be able to successfully communicate. Neither our ability to communicate about hands,

nor the truth of sentences that include the term 'hands' is evidence that **hands** are in the correct

ontology. These pieces of data are evidence that there is something(s) in the world that

corresponds to our term 'hands'. That thing could be **properties, particles, areas of space-time,**

hand time-slices, hand hunks, or **hands.**

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[3] For the purposes of this paper, when I use the term 'correctly apply' I mean truly apply. MTN could be couched in terms of 'correct assertability' instead of 'truth'. On the 'correct assertability' version of MTN, sentences that mention things that don't *really* exist like the sentence 'hands exist' would be merely correctly assertable and not true. Only sentences that only mention things that *really* exist could be true on the 'correctly assertable' version of MTN. There is nothing on my view that precludes this option and I briefly discuss correct assertability at the end of section V. However, for the purposes of this paper I'll couch MTN in terms of 'truth'.

Our perception of hands is not evidence that **hands** are in the correct ontology.[4] The human senses evolved in a way that would best assist humans in surviving in this world. Our ability to see ordinary objects, such as bears, with the naked eye and not microscopic objects, such as quarks, or macroscopic objects, such as more distant galaxies, is the result of years of evolution aimed at survival. We don't yet have reason to think that the things that would be most helpful for us to easily perceive in order to survive are the exact same things that are in the correct ontology. It would be a coincidence if it was the case that the objects of human perception were the objects of the correct ontology.[5] Note that insects, dogs, and humans might perceive the world differently. The objects of perception of one species might not match the objects of perception of another species.[6] There is not yet reason to think that human perception gloms onto the objects in the correct ontology more than any other species' perception. Our ability to perceive and survive in this world is merely evidence that much of human perception is veridical. Assuming that nihilism is true and simples are small objects imperceptible to the naked eye, our perceptions are veridical when they correspond to pluralities of simples in certain arrangements. My seeing a hand is veridical when there is a plurality of simples arranged hand-wise.

There are a couple of ways to consistently claim 'hands exist' is true, but that there aren't *really* hands. In what follows I'll explain how to maintain that hands exist without being ontologically committed to **hands.** I'll also offer a couple of ways to further understand what the

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[4] Though, see Dan Korman (2015) for an argument as to why the perception of hands is evidence that **hands** are in the correct ontology and a response to the arguments that we have no reason to think that our perception of objects maps onto objects in the correct ontology in a one-to-one manner (p. 138- 144).

[5] The argument in this paragraph is a debunking argument. Peter Van Inwagen (1981), Mark Heller (1990, p. 41-42), Trenton Merricks (2001, p. 72-76), and Ted Sider (2013) advance debunking arguments for eliminativism; cf. Michael Jubien (1993, chapter 1.1).

[6] Andy Clark (1997) argues,"aspects of real-world structure which biological brains represent will often be tightly geared to specific needs and sensori-motor capacities" (p. 173). Patricia Churchland et al. (1994) and Kathleen Akins (1996) argue for similar theses. Pete Mandik & Andy Clark (2002) further argues that the aforementioned thesis is best paired with a realist conception of a mind-independent world.

MT-Nihilist can mean by 'ontological commitment' and '*real* existence'. There a few inter-related questions that I'll answer in my discussion of ontological commitment, existence, and *real* existence.

1. What sort of theory of reference will allow me to claim that I have hands when **hands** don't *really* exist?

2. What does 'hand', or any term, mean, given that the meaning of 'hand' cannot just be a **hand,** since **hands** don't *really* exist?

3. How can we make sense of ontological commitment given that we cannot just read off our ontological commitments from ordinary language? If it's not the case that true sentences that begin with "there is…" or "there are…" inform us of our ontological commitments, then what does?

In what follows I'll offer a couple different avenues one may take in order to try to answer these questions. In 1.2, I'll discuss a mixed theory of reference combined with a certain theory of meaning to show how sentences can be true or false without ontologically committing us to the objects and properties they refer to. This view will leave us with the third question from above. In 1.3, I'll discuss a view that answers question three in a way that is compatible with the theory of reference and meaning discussed in 1.2. In 1.4, I'll discuss a view that makes sense of language and ontological commitment in a different manner. I'll remain neutral amongst the two avenues, but I'll conclude that both theories allow the MT-Nihilist to say that hands exist is true in most contexts, but that **hands** are not members of the correct ontology. I'll also show that the constraints that my metaphysical picture puts on a semantic theory are minimal. As long as one's semantic theory does not commit one to a one-to-one correspondence from a sortal term or predicate to an object or property respectively, then my metaphysical picture will not be ruled

out by it. At this point I'll point out that any view of reference that just ontologically commits us to its referents is *prima facie* implausible. Finally, I'll turn to another version of the Moorean objection that claims that at least part of the Moorean intuition is that hands *really* exist.

1.2 Hybrid Theories of Reference– Amie Thomasson

In this section I'll answer questions one and two from above with a hybrid theory of reference. I'll then show how the tenets of Thomasson's (2010) hybrid theory of reference is compatible with MTN. I'll underscore the assumptions the MT-Nihilist makes that conflict with portions of Thomasson's full view. I'll show how the portions of Thomasson's view that conflict with the MT-Nihilist's view are detachable from the hybrid theory of reference that I appeal to.

Hybrid theories of reference aim to appropriate the positive portions of both descriptive and causal theories of reference while ridding themselves of the problematic aspects of both theories. According to hybrid theories of reference the referent of a term is largely determined by the causal source for the term and the descriptive information that speakers associate with the term. While Gareth Evans (1973) is interested in fixing the referent for proper names and does not require that the descriptive information associated with the name to include any specific sort of information, Michael Devitt (1981) requires that the descriptive information the speaker associates with the term to include the *kind* of thing the causal source is in order for the speaker to successfully fix the referent of the term.

Now consider MTN:

MTN: Only the minimal truthmakers for all true sentences are included in the correct ontology and composite objects are not among the minimal truthmakers. Minimal truthmakers do not have proper parts.

In what follows I'll present a case and then show how MTN is consistent with what would be true according to Evans's (1973) hybrid theory of reference. Evans gives the following case:

An urn is discovered in the Dead Sea containing documents on which are found fascinating mathematical proofs. Inscribed at the bottom is the name 'Ibn Kahn' which is quite naturally taken to be the name of the constructor of the proofs. Consequently it passes into common usage amongst mathematicians concerned with that branch of mathematics. 'Kahn conjectured here that…' and the like. However suppose the name was the name of the scribe who had transcribed the proofs much later; a small 'id scripsit' had been obliterated. (1973, p. 203)

According to Evans's (1973) hybrid theory of reference, in the contemporary community of mathematicians 'Ibn Kahn' refers to the original constructor of the proofs and not to the scribe. This is because the mathematician is the causal source of the dominant description the contemporary community of mathematician associate with 'Ibn Kahn'. The original naming (the causal history of the name) of the constructor of the proofs within the contemporary mathematical community associated the information 'constructor of the proofs' with the name 'Ibn Kahn' and so the name refers to the constructor of the proofs and not the scribe. The MT-Nihilist is able to endorse the way in which Evans's hybrid theory of reference deals with the case by claiming that the term 'Ibn Kahn' referred or pluraly referred to whatever it is that actually constructed the relevant proofs. As it need not be the case that the thing or things that constructed the proof compose a single object, the MT-Nihilist can consistently claim that given the particular matters of fact at this world the term 'Ibn Kahn' actually plurally refers to particles that were in a certain pattern. This arrangement of particles plurally constructed the relevant proofs and so they are the referent of the term 'Ibn Kahn'.

In general, the MT-Nihilist can claim that the causal history of a term and the information originally associated with that term allow her to claim that the term pluraly refers to the *things* that were originally associated with that term. In most cases arrangements of particles cause us to pluraly refer to things that don't *really* exist. For example, some particles in arrangement causes us to claim that 'there are hands', thereby referring to things that don't *really* exist since **hands** are not minimal truthmakers. In rare cases the MT-Nihilist will claim that the term singularly refers instead of pluraly referring. Let's assume, for instance, that quarks turn out to be the most fundamental physical particle. Assuming that quarks don't have proper parts, the term 'quark' singularly refers to a microphysical particle. In cases of singular reference, we might be referring to things that *really* exist. A hybrid theory of reference is clearly compatible with MTN.

One might object to the MT-Nihilist's use of plural reference by claiming that the causal source of the original use of the relevant term had a single object in mind and not multiple objects. If the object's being single is not important given the use of the term, then it seems we should not say that reference fails just because the original source of the name had something singular in mind and not plural things. What if the original constructor of the proof was a group of mathematicians? It seems that given the use of the term 'Ibn Kahn' the term would continue to refer to the original constructors of the proofs. One reason we want to say the term would still refer is that whether 'Ibn Kahn' is a single object or plural objects is irrelevant to how the term is being used by the contemporary community of mathematicians. They just want a term to use to refer to the creator or creators of the proofs.

Consider the following example from Thomasson's book *Ordinary Objects* (2010). I'm in a boat and trying to ground the reference of the term 'orky'. I point to something in the water that looks like it is moving and is colored differently than the water surrounding it. In keeping with

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Devitt's hybrid theory of reference as opposed to Evans's, Thomasson claims that in order "to successfully disambiguate whether or not the reference of a term is grounded…it seems that nominative terms must be associated with a sortal or, more generally, categorical concept that does at least two things" (2010, p.39). Thomasson claims that the first thing that the sortal or categorical concept must do is "establish some very basic conditions under which the attempted grounding would or would not be successful in establishing reference" (p. 39, 2010). The sortal provides 'frame-level application conditions' for a term. These conditions are the conditions that are "*conceptually* relevant to whether or not reference is established" (p. 39). In Thomasson's example, I have in mind that orky is an animal as a frame-level condition for establishing the reference of the term 'orky'. So, if it turns out that the stuff I pointed to in the water is driftwood or seaweed, I have failed to establish reference for the term 'orky'. The world must be such that the frame-level application conditions are fulfilled in order to establish the reference for a term.

The second thing the sortal must do in order to establish reference is "to supply frame-level coapplication conditions, that is rules that (supposing the term to have been successfully applied) specify under what conditions the term would be applied again to one and the same entity…For it is only this that disambiguates, for example, the attempt to refer to an animal from the attempt to refer to a mass of cells, or a time-slice of an animal, and so on" (p. 39, 2010). So, for example, if I was trying to establish the reference for the term 'orky', but I didn't have in mind whether or not I meant the current time-slice of orky or a perduring object, I would have to establish coapplication conditions.

Thomasson goes on to explain that "non-sortal terms such as adjectives may supply only criteria of application but no criteria of coapplication" since adjectives do not supply the criteria to determine whether or not the term is being applied to one and the same property (2007, p. 40,

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Ordinary Objects, quoting Dummet 1981, 75). For example, the term 'smooth' does not give me the criteria needed to determine whether "this smooth is the same as that" (2010, p. 40).

In sum, to establish reference according to Thomasson's hybrid theory of reference the following must occur. First, a connection must be established between a term and its referent. So, in the example of 'orky', I establish a connection when I demonstratively point at something in the water and say "orky". This is the initial baptism of the term 'orky'. Second, when attempting to establish that 'orky' refers to whatever I am pointing at in the water I must have application and coapplication conditions associated with the term 'orky' in mind. Thomasson explains, "the application conditions for a sortal term are mastered by learning under what conditions that general term is to be applied or refused, and may be learned apart from learning the conditions under which the term may be twice applied to one and the same entity," which are the coapplication conditions (2010, p. 41). Dummett (1981, p. 74-75) provides the following example. The application conditions for the term 'book' as in physical copy are the same as the application conditions for the term 'book' as in literary work, but the conditions under which we can refer to one and the same physical copy of a book versus the conditions under which we can refer to one and the same literary work are different. I have two physical copies of Plato's *The Republic,* but there is only one literary work that is Plato's *The Republic.* The third condition of reference that must be fulfilled in order to establish reference is that in the original baptism of the term, the world must be such that the application conditions associated with that term are fulfilled. In the case of orky this means that for reference to be established, the thing that I am pointing at must be an animal. According to Thomasson "we should think of application conditions as being fulfilled or unfulfilled by the way the world is; if they are fulfilled, the term is guaranteed to apply" (2010, p. 41).

The referent of a term may be established with more or less determinate application and coapplication conditions. Whether a term determinately refers in every situation depends on the extent that the application and coapplication conditions are determinate. If the application and coapplication conditions for a term are indeterminate, there will at least be some situations in which it is indeterminate whether or not reference succeeds. In addition, it is important to note that while the application and coapplication conditions establish the meaning for the term, a competent user of the term need not be able to articulate the application and coapplication conditions of the term. A competent user of a term must only know when to use and refuse the application of the term in practice.

According to Thomasson, a sentence is true when its truth-conditions are fulfilled by the world. The terms in a sentence determine the truth-conditions for that sentence. The terms garner their meanings from their application and co-application conditions.[7] For example, the sentence 'This dog has a tail' is true because the application and co-application conditions for the term 'tail' are such that it must be the case that one could correctly apply the term 'tail' to a portion of the dog (pictured below) that is being referred to. If the picture below accurately represents the world, then the world is such that 'this dog has a tail' is true.

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[7] More precisely, Thomasson explains that the rules governing the use of a term constitute the terms meaning. She claims, "application conditions…are certain basic rules of use that are among those that are meaning-constituting for the term" (2015, p.93). Other rules that constitute the meaning of terms are "co-application conditions" and "exit-rules, which tell us what we are committed and entitled to on the basis of applying a term" (2015, footnote 4).

Image 1

MTN works with Thomasson's hybrid theory of reference to produce a view on which 'this dog has a tail' is true, but neither dogs nor tails are contained in the correct ontology. According to the fusion of the two views one can successfully refer to dogs and tails, the application and co-application conditions for the terms 'dog' and 'tail' contribute to the truth-conditions for the sentence 'this dog has a tail', and the ontological commitments of the sentence 'this dog has a tail' are whatever actually acts as the minimal truthmakers for this sentence at this world. According to the MT-Nihilist, at this world none of the minimal truthmakers for 'this dog has a tail' are composite objects. 'This dog' refers to the dog despite the fact that the dog doesn't *really* exist. The things in the world that fulfill the truth-conditions for 'this dog' in the aforementioned sentence are simples located in space-time.

How does the fusion of the two views work with other sentences? Consider the following sentences:

1. There is a dog.

2. This dog is partially brown.

3. There are not unicorns.

4. There is magic.

The conditions under which 'dog' applies to object(s) might be something like the following. Apply 'dog' when you see something that is similar to the above picture and that the thing is an

animal, has four legs (most of the time), barks, has a tail (most of the time), two eyes, two ears, a nose, a mouth, paws, sharp teeth, eats meat, and is not a wolf. Sentence 1 is true iff there is something(s) in the world that fulfills these application conditions for the term 'dog'.[8] According to a MT-Nihilist, simples in arrangement fulfill the truth conditions of sentence 1. Sentence 2 is true iff the things that I'm gesturing towards fulfills the application conditions for the term 'dog' and the application conditions for the term 'partially brown'. The MT-Nihilist will claim that some simples in a dog arrangement, a light arrangement, and a human eye and brain arrangement fulfill the truth-conditions for sentence 2. The truth-conditions for sentence 3 are fulfilled because there is nothing in the world that fulfills the application conditions for the term 'unicorn'. There is nothing that is horse-like with a single horn protruding from its forehead that has magical powers. The MT-Nihilist will claim that there are no simples in the arrangements that would be required to fulfill the truth-conditions of sentence 3. Sentence 4 is not true because there is nothing in the world that fulfills that application conditions for the term 'magic', since there is nothing is the world that fulfills the application conditions for the term 'supernatural'. The MT-Nihilist will claim that the reason sentence 4 isn't true is because there are no simples in arrangements that would fulfill the truth-conditions of sentence 4.

1.2.1 Ontology Doesn't have to be Easy

One way that the MT-Nihilist can claim that 'hands exist' is true, but they don't *really* exist is by stipulating an ontological quantifier that only quantifies over the minimal truthmakers and is not the English quantifier. This stipulated second quantifier is privileged as it carves at the

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[8] One might think that it's part of the application conditions that 'dog' applies to a single object. As discussed above, it seems that the simples in dog arrangement come near enough to satisfying the application conditions of 'dog' and the simples in arrangement also satisfy the important descriptions associated with 'dog'. The mere fact that it's *really* a plurality of things and not a single thing is not enough to constitute reference failure.

joints of nature and only quantifies over those things that *really* exist.[9] I'll further discuss this

quantifier in 3. The MT-Nihilist can thus claim 'there are hands' is true in English, but the joints

of nature don't carve out hands and thus the ontological quantifier does not quantify over hands.

In this section I'll show that the MT-Nihilist can accept Thomasson's hybrid theory of reference,

her theory of meaning based on application and coapplication conditions, and also accept a

privileged ontological quantifier that only quantifies over what *really* exists.[10]

Thomasson marries her hybrid theory of reference and her theory of meaning to deflationism

about ontology. As a deflationist, Thomasson holds that ontological questions are *easy* because

all ontological questions can be answered as long as you know whether or not the world is such

that the application and coapplication of the term in question are fulfilled. As a deflationist,

Thomasson rejects that there is an ontologically privileged sense of *existence.* Thomasson

doesn't think that one can consistently claim that while hands exist, they don't *really* exist.

While she admits that there are many ways one might try to make sense of the claim 'hands

exist, but they don't *really* exist', she only explicitly rejects stipulating a privileged ontological

quantifier to make sense of such claims. Thomasson (2015) briefly provides a sketch of an

argument against a privileged ontological quantifier. First, I'll summarize this argument. Then,

I'll show how the MT-Nihilist can reject this argument while consistently endorsing

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[9] Cameron (2010) and Sider (2009, 2011 p. 172) endorse views that are consistent with the claim that existence questions in English may be answered easily. Thomasson's (2015) easy ontology method that looks to see whether or not application and co-applications for terms are fulfilled by the world is one way to answer existence questions in English that is consistent with the views Cameron (2010) and Sider (2009, 2011 p. 172) endorse. But ontologese existence questions, questions about what *really* exists, cannot be answered so easily according to Cameron and Sider. Both posit an existential quantifier that refers to the things carved out by the joints of nature. The idea that there is a 'natural quantifier' (what I am calling the 'ontological quantifier) that quantifies over the things carved out by the joints of nature comes from David Lewis's idea that some terms are more natural than others (p. 1983, 1984). For example, 'green' is more natural than 'grue'.

[10] Thomasson (2015) explicitly reject this kind of privileged ontological quantifier, but doesn't offer a full argument against it (p. 296-299).

Thomasson's theories of reference and meaning. My aim is merely to show that one can accept Thomasson's hybrid theory of reference and reject ontological deflationism.

Thomasson (2015) claims that logical terms such as quantifiers are "content neutral" (p.312). Content neutral terms may govern other terms that "aim to map different structural features of the world", but content neutral terms themselves are "independent of subject matter" (p.212). Content neutral terms don't have a topic, so their topic cannot be the structure of the world. Content neutral terms don't aim to describe the world as it is not their function (p.312-313). Thomasson seems to argue that if there were a quantifier that carved at the joints of nature (a quantifier that only quantified over the things carved out by the joints of nature), then that quantifier would aim to describe the world. Since quantifiers are content neutral, they cannot aim to describe the world, therefore there cannot be a quantifier that carves at the joints of nature. Thomasson thus can claim that deflationists like her "are not making the metaphysical claim that there are no such joints, but rather the linguistic claim that the thought that there are is based on a mistake about the way part of language works" (p. 316).

The MT-Nihilist can reject Thomasson's argument for ontological deflationism while endorsing her views about reference and meaning by rejecting that quantifiers *must be* content neutral and thus cannot describe the world. The MT-Nihilist can reject this claim by either claiming that in general logical terms are not content neutral, claiming that in general logical terms are content neutral, but that quantifiers are not content neutral, or by claiming that logical terms including quantifiers are generally content neutral, but that they need not be. Quantifiers can serve their function and have some content as is shown by the stipulation of a privileged ontological quantifier. It is not difficult to understand how the ontological quantifier has the logical role of any other quantifier, but that unlike the English quantifier, it also aims to map the

structure of the world. I don't see what bars the stipulation of a quantifier that performs both a logical function and descriptor function. None of the claims listed by which the MT-Nihilist can reject Thomasson's argument against the privileged ontological quantifier bar the MT-Nihilist from consistently accepting Thomasson's theories of reference and meaning. Thus, it is consistent to posit a privileged ontological quantifier, rejecting ontological deflationism, while endorsing Thomasson's views about reference and meaning. The MT-Nihilist can agree that 'there are tables' and 'there are dogs with tails' are both true, but deny that the truth of these sentences commits you to having ordinary objects in your ontology.

In sum, Thomasson's hybrid theory of reference and theory of meaning are compatible with claiming that the only things that *really* exist are minimal truthmakers and our ordinary English sentences are made true by the minimal truthmakers, their locations in space-time, and some facts about language. This of course relies on the fact that we can make sense of *ontological commitment* in a meaningful way. In the next section I'll discuss the aforementioned ontological quantifier and how Ross Cameron uses the ontological quantifier to make the distinction between what there is and what there *really is.* Cameron's ontological quantifier may be combined with Thomosson's hybrid theory of reference and meaning to yield a view that allows the MT-Nihilist to claim that while many ordinary English sentences about what exists are true, only minimal truthmakers *really* exist. In section 1.4, I'll discuss Terence Horgan and Matjaž Potrč's view which makes sense of the meaning of ordinary English sentences and ontological commitment in a very different way. In the end, I'll leave the MT-Nihilist with two separate ways of making sense of her view. She may either take Thomasson's view of reference and meaning and Cameron's ontological quantifier or Horgan and Potrč's view. It might be that there are many other ways for the MT-Nihilist to make sense of her view that 'there are hands' is true, but hands

don't *really* exist. But, as the purpose of this paper is merely to show the MT-Nihilist's view is a defensible coherent view, two ways will more than suffice.

1.3 The Natural Quantifier– Ross Cameron

Ross Cameron (2010) posits an ontological quantifier to consistently claim, 'I have two hands' is true in English, but hands don't *really* exist. Cameron explains that the English existential quantifier does not carve nature at its joints.[11] The English quantifier acquires its meaning from a mix of the use of the terms 'there is…' and 'there are…' as well as the quantificational joints of the world, which act as reference magnets. The world has natural quantificational joints, but the English quantifier does not glom onto the natural quantificational joints of the world. Since it would be practicably impossible to use the existential quantifier that only quantifies over the things carved out by the structure of the world, we don't use that existential quantifier when speaking in English. Use can trump naturalness in English and so 'there is…' does not glom onto the things that the joints of nature carve. Thus, 'I have two hands' in English is made true by simples arranged in space-time, assuming nihilism is true. 'I have two hands' is not true when using the natural existential quantifier, which only quantifies over the objects that nature carves out at its joints.

One way one might make sense of the fact that 'there are two hands' is true, but that hands don't *really* exist, is as follows. The sentence 'there are hands' can be paraphrased to 'there are simples arranged hand-wise' in which case one is only ontologically committed to simples.[12] One is only ontologically committed to the things that *need* to be quantified over in our best scientific theories. Since we can paraphrase away the term 'hands' and still give a complete story

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[11] For a discussion of 'joint carving' and ontology see Sider, T. (2011). *Writing the Book of the World.* Oxford: Clarendon Press.
[12] Peter Van Inwagen (*Material Beings*, 1990) first uses the 'arranged hand-wise' locution in his paraphrase strategy.

of the world, we are not ontologically committed to hands. Cameron rejects this strategy as he thinks that it makes the mistake of letting "facts about language drive ontology", which he calls "linguisticism" (2010, p. 11). Cameron explains, "it's a mistake to think that the ontological question concerning abstracta, for example, has anything at all to do with the availability of a paraphrase of certain sentences which talk about abstracta in terms of certain other sentences that don't" (2010, p. 11). He argues that the use of the term 'there are…' in English figures into the meaning of the term 'there are…' in English. So, unless we think that the use of 'there are…' tracks our ontology, there's reason to think that we can't read off our ontology from the sentences in English of the form 'there are…'. Claims of existence are sensitive to how we speak about the world because the use of 'existence' informs its meaning. So, even to claim that we can read our ontology off of paraphrases of English sentences of the form 'there are…' is to make the mistake of thinking that our use of the term 'there are…' tracks our ontology in some way. Cameron claims, "that in English, 'exists' works such that not everything that exists has being (is an element of ontology)[;]…'x exists' can express a truth…because there's some element of our ontology y (because y really exists, and we just happen to use our language is such a way that 'x exists' expresses a truth when y really exists)" (2010, p.11-12).[13] 'X exists' is true, but x is not part of our ontology. Some simples, the y elements of our ontology, make true 'x exist' where x is a complex object.

Instead of the paraphrase strategy, Cameron suggests that we posit a new term 'there *really* is'. The use of the term 'there is' does not figure into the meaning of the term 'There *really* is'. Cameron thinks that there is metaphysical quantificational structure to the world and this structure is the "single candidate meaning for the quantifier that is more natural than any

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[13] I inserted the brackets into Cameron's text.

other[;]…this is the meaning for the quantifier that carves the world at its quantificational joints" (2010, p. 15).[14] The world really comes carved into objects. Just like the property of being green is more natural than the property of being grue, there are some meanings of 'there is…' that are more natural than others.[15] The meaning of 'there is…' when considering the correct ontology is the most natural meaning of 'there is…'. Cameron explains, "the ontological question, then, is; what *really* exists?" (2010, p. 16-17). So, ontologists shouldn't be concerned with what there is, they should be concerned with what there *really* is. Thus, one can't read off ontology from ordinary language as that would only lead one to what there is and not what there *really* is. Cameron states, "only the truthmakers for true sentences of English" *really* exist (2010, p. 17).

The takeaway from this section is that while sentences and terms in English may acquire meaning in the way described in 1.2, one cannot read off what there *really* is from English sentences. The use of 'there is' affects the meanings of 'there is' in English and may trump facts about the structure of the world. When asking ontological questions, the use of 'there is' in English doesn't trump the structure of the world. The structure of the world and what it carves out determines what there *really* is. To find out what there *really* is, one must look at the truthmakers for the true sentences.

So, according to a MT-Nihilist that ascribes to Cameron's view of ontological commitment, all that *really* exists are simples located in space-time. When speaking in English and using the English quantifier, many things besides simples exist such as tables and people. Terms in English acquire their meanings through their application and coapplication conditions. The terms in English are guaranteed to refer if their application and coapplication conditions are fulfilled. The

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[14] I inserted the brackets into Cameron's text.
[15] The property of being grue is the property of being green and being examined before some future time or being blue and not being examined before that time.

things that fulfill the application and coapplication conditions for English terms are the things that *really* exist and these things are **simples** located in **space-time**. Thus, we are only ontologically committed to **simples** located in **space-time**.

1.4 Indirect Correspondence and Contextualism– Horgan and Potrč

Instead of endorsing a Thomasson-Cameron view to make sense of how it is that 'hands exist' is true, but hands don't *really* exist, the MT-Nihilist can instead endorse a view like Horgan and Potrč's (2008) indirect correspondence and contextualism. Horgan and Potrč argue in favor of a view according to which "there is a mind-independent, discourse-independent, world" and "truth is correspondence between language and thought on one hand, and the world on the other" (p. 3). They explain that "truth is semantic correctness, under contextually operative semantic standards[;]…semantic correctness…is a feature that depends jointly on what the operative semantic standards are and the **world**" (2008, p. 39).[16] Truth involves correspondence to the **world**, but the kind of correspondence required is a matter of operative semantic standards, which change with context. Sometimes the operative semantic standards require a direct correspondence (DC) between language/thought and the **world**. DC semantic standards require a one-to-one correspondence between a term or adjective and an **object** or **property.** Other times the semantic standard merely requires an indirect correspondence (IC) between language/thought and the **world**. IC standards will not require a one-to-one correspondence between a term or adjective and an **object** or **property**. Horgan and Potrč explain, "DC standards can be expected to be frequently operative, for instance, in contexts of ontological inquiry. In these contexts, after all, one is asking about what **objects** there are in the **world**, and what **properties** and **relations** are instantiated by these objects" (p.42). Ordinary

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[16] I am inserting the semicolon in the square brackets into their quotation. The boldfacing in this quotation is their own. For Horgan and Potrč, the boldface corresponds to *real* objects and/or properties.

discourse, on the other hand, generally employs IC standards. For example (a)-(e) below are true in most contexts where we are not doing metaphysics. They are all true in most contexts because the **world** is such that they are true given the IC operative sematic standards in their contexts of utterance.

(a) The University of Ljubljana is a public institution.

(b) Mozart composed exactly twenty-seven piano concertos.

(c) There are more than twenty regulatory agencies in the U.S. Federal Government.

(d) Quine's *Word and Object* is an influential book.[17]

(e) I have hands.

So, what do (a)-(e) mean? Horgan and Potrč explain, "intuitively and pre-theoretically, meaning is what combines with how the world is to yield truth. Thus, if truth is correct affirmability under operative semantic standards, then the role of meaning is played by the semantic standards themselves" (p. 43). The meaning of (a)-(e) will, at least in large part, be a matter of the operative semantic standards in their context of utterance or thought. Horgan and Potrč explain, "Contextual variability in parameter values constitutes a more subtle, more fine-grained kind of semantic variation than does nonidentity of concepts or meanings. As one might put it (adapting a term made famous by Derrida), changes in parameter values yield a différance—not a difference—in meaning" (p.57). So the meaning of (a)-(e) may have one meaning under IC standards, which are generally operative in ordinary contexts, and a différant meaning under DC standards, which are generally only operative when we are discussing ontology or metaphysics. In general, if a sentence is semantically correct under IC standards, but not semantically correct under DC standards, then the sentence when uttered under IC standards will semantically differ

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[17] I borrowed these four sentences as examples of sentences usually uttered in contexts where the operative semantic standards are IC semantic standards from Horgan and Potrč (2008, p. 41).

from the sentence when uttered under DC standards.[18] The truth-conditions of a sentence are also

determined by the operative semantic standards in the context of utterance. Horgan and Potrč

explain, "a thought's or sentence's truth conditions are constituted…by a range of ''centered''

possible worlds with a designated location as the location of the thinker/utterer of the

thought/sentence" (p. 35). A centered possible world is a maximal way the world could be given

that the utterer or thinker is a part of that world. This maximal way the world could be is a

maximal self-involving property that the world could instantiate. So, "a thought or sentence

corresponds to the world just in case the world instantiates one of the maximal self-involving

properties that collectively constitute the thought's/sentence's truth conditions" (p. 35). The

utterance of the sentence is true, when the world is one of the ways such that the truth-conditions

are fulfilled.

According to Horgan and Potrč ontological commitments are the commitments that are

"incurred by thought/language when the contextually operative semantic standards are DC

standards" (p.43). They emphasize that ontological commitments are different than what they

call "ontic commitments", which "concerns the range of putative entities overtly posited by a

given mode of thought/discourse" (p. 43). While (e), when uttered in some contexts where the

contextually operative semantic standards are IC standards, incurs an ontic commitment to

hands, (e) does not incur an ontological commitment to **hands.** Ontic commitments are the

alleged objects mentioned in sentences. When we claim that something exists under DC

standards, we are ontologically committed to that thing. According to a MT-Nihilist committed

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[18] Horgan and Potrč also explain that they are committed to the following thesis: "In general, if a statement S is semantically correct under IC semantic standards, but S is not semantically correct under DC standards, then S is not equivalent in meaning to—or approximately equivalent in meaning to—a statement that is correctly affirmable under DC semantic standards" (p. 43).

to the contextualism of Horgan and Portč, 'there are composite objects' is true in most contexts where IC semantic standards are operative, but 'there are composite objects' is false in contexts where DC semantic standards are operative. According to the MT-Nihilist, only terms that refer to simple objects correspond directly to **objects**.

Given that the meaning of a term will depend upon the operative semantic standards in the context of that term's utterance/thought and that reference at least in part determines the meaning of a term, the meaning of the term 'refer' must also depend upon the operative semantic standards in a context. Horgan and Potrč explain, "notions like reference are subject to contextually variable semantic standards of correct usage—and can be employed in IC ways as well as in DC ways" (p.48). So, the meaning of the term 'refer' depends on its context of utterance because the operative semantic standards change with context. When the one is attempting to discover what the correct ontology needs to be in order for a thought/sentence to be true, the "most contextually appropriate way to use notions like reference, object, property, and relation is a direct-correspondence way" (p. 48-9). In contexts where DC sematic standards are operative it is true to say that "under IC semantic standards, the singular and quantificational constituents of a thought/sentence need not refer to objects, and that the predicational constituent need not refer to a property or relation" (p. 48-49). This is to say that in ordinary contexts where IC semantic standards are operating, our terms need not refer, where the meaning of 'refer' is determined by DC semantic standards, to objects and our predicates need not refer to properties or relations. When talking to my doctor, if I tell her that I have two hands, the term 'hand' need not refer ('refer' is being used in a DC context) to an **object**.

Horgan and Potrč claim that their view is not a truthmaker view. They claim that a "thought/statement is made true by the world as a corporate body rather than by any specific

state of affairs" (p.37). They explain that since sentences/thoughts under IC standards are not made true by "object or objects posited in the atomic thought/statement" instantiating "the posited property/relation" (p. 37), their view is not a truthmaker view. However, the sense of truthmaking that my MT-Nihilist is committed to merely requires that something or some things in the world make sentences/thoughts true. This sense of truthmaking is compatible with Horgan and Potrč view. The MT-Nihilist that I am concerned with is content to say that some sentence/thought is made true by the way the world is.[19]

In sum, I have described two ways to make sense of the MT-Nihilist's commitment to both the truth of many English sentences that mention ordinary objects and an ontology without composites. She can either explain her view using Thomasson's hybrid theory of reference and Cameron's ontological quantifier or she can use Horgan and Potrč contextualism to explain her view. Either way, she can coherently claim that 'hands exist' is true in English, but hands don't *really* exist.

1.5 Reference, Meaning, Truth-Conditions, and the MT-Nihilist

Thus far in this paper I have explained how the MT-Nihilist can consistently claim that (1) she is only ontologically committed to the minimal truthmakers, which don't include composite objects, and (2) many English sentences that mention ordinary objects are true. In this section I'll show that the MT-Nihilist puts minimal constraints on theories of reference, meaning, truth-conditions, and theories of when a sentence comes out true. I'll call a theory that includes a theory of reference, a theory of meaning, a theory of truth-conditions, and a theory of when a

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[19] I prefer a MTN that is committed to objects in arrangement acting as minimal truthmakers rather than Horgan and Potrč's view that is committed to the way the world is being the truthmaker. However, my reasons are related to my preference for nominalism, which is beyond the scope of this dissertation.

sentence comes out true, a 'full semantic theory'. A view that counts as what I'm calling 'MTN' is committed to the following claims:

1. Objective World: This world is mind-independent and exists in some maximally specific way or other.[20]

2. Truthmaker Principle: All true sentences that require truthmakers are made true by the existence of this world or things in this world.

3. Ontological Commitment: The correct ontology of this world only includes the minimal truthmakers of all true sentences that require truthmakers.

4. Nihilism: The correct ontology of this world only includes simple(s) located in space-time.

5. Ordinary Claims: Many English sentences that mention ordinary objects are true.

The five commitments put minimal constraints on a full semantic theory. If you are committed to the above five, then you cannot consistently claim that (A) reference only succeeds when a term corresponds in a one-to-one manner to something that is a member of the correct ontology and (B) sentences are only true if reference succeeds. I'll call a commitment to A 'direct correspondence reference' or 'DC reference'. If reference is DC reference, then one cannot successfully refer to things that aren't members of the correct ontology. If reference is DC reference, terms that don't correspond in a one-to-one manner to things that are members of the correct ontology are extensionless or empty terms. If an atomic sentence mentions terms that are empty, then, if B is true, the atomic sentence cannot be true as it is unclear what would be required of the world to render the sentence true. In order for 'I have a hand' to be true it would

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[20] Technically, one could be a MT-Nihilist and not think that there is a mind independent world. There is nothing essential to the MT-Nihilist view that precludes one from being an Idealist of some sort. But, I am committed to a mind independent world.

have to be the case that the term 'hand' refers in a one-to-one manner to a single thing in the correct ontology, a **hand.** Since the MT-nihilist is committed to 1-5 above, she cannot accept a full semantic view that entails that the ontic posits made in all true sentences are actually ontological posits. She cannot accept that every true sentence in English only mentions things that she is ontologically committed to.

In addition, the MT-nihilist is committed to the fact that whatever full semantic view is correct, this view must allow us to talk about metaphysics without changing the rules of our used language, English. We must be able to say what *really* exists without claiming that it is false to say 'there are tables'. So, if need be, the full semantic view must at least allow us to posit a term that allows us to speak of metaphysics, *pace* Thomasson's (2015) ontological deflationism discussed in 2. In section 3 I discussed an ontological existential quantifier that only quantifies over things that are carved out by the structure of the world and in section IV I discussed direct and indirect correspondence. If as a MT-nihilist you prefer to posit an ontological existential quantifier, then you can only commit to a full semantic theory that allows you to stipulate a term that is specifically meant to get at the correct ontology. If as a MT-Nihilist you prefer a theory similar to Horgan and Portč's, then you can only commit to a full semantic theory that allows for the semantic standards to shift with context such that in DC contexts "there are hands" is not true and in IC contexts "there are hands" is true.

Now, you might be a nihilist, not an MT-nihilist, who thinks that reference is DC reference, but that most of our ordinary sentences are assertable, but not true. You might be a nihilist who thinks that the only objects that we can successfully refer to are simples. This view is similar to my own view in some respects. Both views are only ontologically committed to simples and both views are committed to the fact that there is an important difference between the sentence "there

are tables" and the sentence "there are unicorns". The important difference between these two views is that I think we can refer ('refer' is being used in a IC context) to things that we are not ontologically committed to and that there are true sentences that mention things that we are not ontologically committed to while the other view does not think we can refer to things we are not ontologically committed to and we cannot mention things in true sentences that we are not ontologically committed to. One might embrace this alternate view, I don't. I think the choice between the two views will depend on what the difference between correct assertability and truth is and why it is important to make such a distinction between sentences that only mention things that are members of the correct ontology and sentences that do not. Thus far in this section I have described the minimal constraints the commitments of the MT-Nihilist puts on a full semantic theory; next I'll explain why full semantic theories that violate these constraints seem pre-theoretically implausible.

As explained in 1.1, it seems *prima facie* implausible that humans' perceptual faculties are such that they glom onto the correct metaphysics. As such, it seems implausible that our language gets at the correct ontology in a way that one would be able to read off what *really* exists from ordinary sentences. Ordinary language was created with describing the world in a way that aims at successful communication in an efficient manner given human perceptual faculties and cognitive abilities, both of which are incredibly limited. Any full semantic view that entails that the correct ontology can be read off of ordinary sentences, but does not explain how it is that our ordinary language, whose function is not to describe the world in an ontologically serious way, somehow gets at the true ontology is at least pre-theoretically implausible. Language was not created with only the purpose of perspicaciously describing the correct metaphysics. The creation of language and the ends of language do not coincide with the ends of

metaphysics. So, we should not expect that the correct ontology can be found by inspecting ordinary language. In fact, without an explanation as to why ordinary language coincides so perfectly with the correct metaphysics, it would almost be an unbelievable coincidence to discover that the correct metaphysics could be found out by reading it off of our ordinary language.[21]

Given that there is structure to the world, the challenge to those who think we can read off the true ontology from ordinary language is to give an explanation as to how it is that our naked perceptual faculties and the aims of ordinary language both glom onto that structure. Knowing what we do about the sciences, it is vastly more plausible that our perceptual faculties glom onto whatever things it is more useful for our species to consider and be aware of. If this is the case, in order to have reason to think that ontology can be read off of ordinary language, we would need reason to think that the things that are useful for us to be aware of and the things that foster an efficient form of communication are the things that we have most reason to be ontologically committed to. It is much more likely that our language gloms onto whatever it is that we can easily perceive and whatever it is most useful to be able to talk about quickly and clearly ('is' here should be understood as it would be in an IC context).

In sum, I have shown a couple of ways the MT-Nihilist can make sense of her claim that 'hands exist' is true, but hands don't *really* exist. I have demonstrated that the constraints the MT-Nihilist puts on a full semantic theory are minimal. One cannot be a MT-Nihilist and be committed to both A and B above. And I have explained that at least pre-theoretically, a full

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[21] Though see Korman (2015) for an argument as to why this might not be a coincidence (p. 138- 144); cf. Robert Carry Osborne (2016).

semantic view that is committed to both A and B is implausible. I'll now return to a version of the Moorean objection that one may think holds sway against MTN.[22]

1.6 The Moorean Objection Again

In section 1.1, I argued that the MT-Nihilist has an easy response to the Moorean objection because according to her theory 'I have two hands' is true. In addition, I argued that the evidence garnered from our perceptual faculties and our ability to communicate with one another does not tell in favor of one theory of composition over another as long as the relevant theories of composition can explain with their requisite ontologies why the vast majority of our perceptions are veridical and why we are able to communicate successfully with terms that do not directly correspond to objects or properties in the correct ontology. In this section, I'll address a different version of the Moorean objection. The Moorean may argue as follows:

> It is not just the case that it is true that I exist and that there are tables and that things in the world act as truthmakers for sentences like 'I exist' and 'there are tables', rather it is the case that I *really* exist and that tables *really* exist. Tables and people belong in the correct ontology. Our intuitions that we exist and that ordinary objects exist cannot be accommodated by merely claiming that sentences that include the term 'I' and 'table' are made true by simples in arrangements in space-time. Our intuitions are about the structure of this world. Our intuitions are about what *really* exists. It is this strong intuition that you, MT-Nihilist, have failed to satisfy or even take into account. If you took this intuition as lending

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[22] There are ways to be an MT-nihilist that I haven't explored. Thus far I have considered views according to which *real* existence is quantificational or signals a semantic standard requires direct correspondence between word and object. *Real* existence could also be first-order. For instance, *real* existence could be a property. Thanks to André Gallois and Kris McDaniel for this suggestion.

weight in support of a view about composition, perhaps you would not think that you have most reason to accept MTN. Or even more strongly, any view that does not accommodate this intuition is not a satisfactory view and ought to be rejected. It is of utmost importance to satisfy the intuition that people and ordinary objects *really* exist.

I think that this Moorean and I fundamentally disagree about the evidential weight we ought to give to intuitions about the metaphysics of the world. I don't think that we have intuitions about what *really* exists[23] and if we did they would be so slight as to not carry any weight. The Moorean as described in this section, on the other hand, thinks that we do have such intuitions and these intuitions are pieces of evidence that should be taken seriously when considering which metaphysical view one has most reason to accept. As the evidential weight and epistemology of metaphysical intuitions is outside the scope of this paper, I'll leave the debate over metaphysical intuitions between the MT-Nihilist and the Moorean unfettered.

I'll leave the reader with this final thought. I have answered both the original objection from the Moorean against the MTN and the related objection that one cannot consistently claim that 'hands exist', but 'hands don't *really* exist' in defense of the MT-Nihilist. The work that needs to be done to defend the MT-Nihilist from the objection from metaphysical intuitions is a debate over the method of metaphysics.

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[23] I am using the term '*really* exists' as explained in I. The objects that *really* exist are the objects in the correct ontology. I say the objects in the correct ontology are the minimal truthmakers for all true sentences that require truthmakers. So, unicorns don't exist, but unicorns also don't *really* exist. 'Unicorns don't exist' because there aren't **objects/properties** in the world that can make true 'unicorns exist'. Unicorns don't *really* exist because unicorns are not members of the correct ontology. I say this is because unicorns are not minimal truthmakers.

Chapter 2

Nihilism, But Not Necessarily

Scientists and metaphysicians alike typically accept that the best theory is that which best exhibits the following set of naturalistically respectable criteria: i) internal consistency, ii) consistency with the facts, and iii) exemplification of the theoretical virtues. In addition, it's metaphysical orthodoxy that true metaphysical theories are *necessarily* true. I argue that principles of material composition are contingently true by applying the aforementioned criteria at different *prima facie* possible worlds. If you accept that the best theory is the theory that best exhibits i)-iii), then the contingent local matters of particular fact at different possible worlds give us most reason to accept different theories of composition at different worlds.

The special composition question asks 'when do two or more objects compose a further object?' (Van Inwagen, 1990). There are, broadly speaking, three ways of answering this question: that any collection of two or more objects always compose a further object (Mereological Universalism), that no objects compose a further object (Mereological Nihilism), or that only some collections of objects compose a further object (Compositional Restrictivism).[24] I argue that we have most reason to accept the principle of composition, Universalism, Nihilism, or Restrictivism, that best satisfies the aforementioned criteria at a world.

I apply the aforementioned criteria to three kinds of *prima facie* possible worlds. First, I apply it to a non-gunky world without emergent properties. A gunky world has at least one gunky object. An object is gunky iff it has proper parts and its proper parts have proper parts *ad*

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[24] I've omitted existence monism (which holds that there is only one object; the world) because, on my nuanced definition of Nihilism in section 1, it's a kind of Nihilism.

infinitum. So, at this first world there aren't any gunky objects. In addition, there aren't any emergent properties – properties that cannot be reduced to the properties of single particles or the properties of particles working together. I take this first world to be *our* world, though my argument that principles of material composition are contingently true doesn't hang on this assumption. Second, I apply the criteria to a gunky world without emergent properties and third, to a gunky world with emergent properties. I argue that the best principle of composition at the first world isn't the best theory at the second or third worlds and vice versa. So, if we accept the above criteria, then we should reject Composition Necessitarianism (CN) – the theory according to which either Nihilism Necessitarianism is true, or Restrictivism Necessitarianism is true, or Universalism Necessitarianism is true

In section 2.1, I outline the methodological criteria to which I appeal. I apply the methodology to our world to show how to apply the methodology to contingent local matters of particular fact at a world to determine the best principle of composition at that world. I argue that at our world, and at worlds that are relevantly similar, in the particular case of composition, only the theoretical virtue of parsimony can settle the debate. In section 2.2, I argue that Nihilism is the most parsimonious of the theories of composition. In section 2.3, I argue that applying the established methodology at two further possible worlds has a surprising result, namely that we have most reason to accept that principles of composition are contingent. In section 2.4, I argue that this fact allows the Nihilist to respond to the objection to Nihilism from the possibility of gunk. The proponent of Nihilism contends that gunky worlds, while possible, don't preclude the contingent truth of Nihilism.

2.1 Evaluating a Theory at a World

Let's first consider each of the above criteria in turn before we apply them to determine the best theory of composition. A theory is *internally consistent* iff it is consistent *with itself*. In contrast, a theory is *externally consistent* iff it is consistent with the rest of the world or with the facts. So, for instance, theory T is externally consistent at some possible world, W, when it consistent with the local matters of particular fact at W.[25] By local matters of particular fact I mean the particle distribution at W that all plausible theories of composition accept. In worlds without particles, a theory must be consistent with the distribution of simples, which might be, for instance, properties, waves, or fields at W. Given this understanding of consistency, Universalism, Nihilism, and Restrictivism are each internally consistent at all possible worlds and externally consistent at our world. So neither criterion (i) or (ii) gives us reason to favor one over the others at our world.[26]

Our third criterion is (iii): exemplification of the theoretical virtues. I understand the theoretical virtues of a theory to include:

- *Testability*: the extent to which empirical tests can confirm it.

- *Fruitfulness*: the extent to which the predictions it makes can be confirmed.

- *Conservatism*: the extent to which it fits with considered existing knowledge.[27]

- *Explanatory Power:* the extent to which a theory can explain the way things are in the world.

- *Parsimony:* the extent to which a theory is simple.

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[25] I'm using the phrase 'local matters of particular fact' in the same manner as David Lewis. Lewis explains "all there is to the world is a vast mosaic of local matters of particular fact, just one little thing after another…we have a geometry: a system of external relations of spatio-temporal distance between points, maybe points of space-time itself, maybe point sized bits of matter, or aether or fields, maybe both. And at those points we have local qualities. And that is all. There is no difference without a difference in the arrangement of qualities" (1986b, p. ix-xi).
[26] Perhaps a theoretical virtue is a theory being able to claim that much of our perceptual data is veridical. I will address this worry below in my discussion of conservatism.
[27] See W.V.O. Quine (1978, pp.40-41) for a similar explication of conservatism and further discussion.

With respect to the composition debate, neither testability nor fruitfulness can help adjudicate as they rely on empirical testing, and theories of composition are not empirically testable.[28] Conservatism, explanatory power, and parsimony, on the other hand, do *not* rely on empirical testing. So, of the internally and externally consistent rival theories at some possible world, W, we should accept the theory with the best combination of conservatism, explanatory power, and parsimony.

We can ask which theory of composition is most conservative by asking which theory of composition fits best with existing knowledge. Intuitively, the different theories of composition should score differently on this test, since they have such radically different ontologies. For instance, we probably want to count 'tables exist', and 'eiffel-tower-table-chairs don't exist' as part of our existing knowledge. Accordingly, we might expect Nihilism and Universalism to lose out to Restrictivism when it comes to conservatism. However, this isn't the case. In the face of conservatism, the ontologist can merely combine their favorite theory of composition with a truthmaker theory and claim, given the way language works, the sentence 'Nations exist,' doesn't depend for its truth on nations being in the correct ontology.

According to truthmaker theory, our ontology only includes the minimal truthmakers for all true sentences – that is, the smallest number of entities needed to make those sentences true.[29] 'Sally saw Jenny', then, might be made true by the existence of particles, forces, mass etc., without having to admit anything like Sally or Jenny or the property of seeing into our

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[28] This is contentious. Descartes and Van Inwagen (1990) think we can confirm our own existence by conducting a sort of empirical test: thinking. I contend that our language and our perceptions don't give us the kind of evidence required to choose between Nihilism, Restrictivism, and Universalism. This will become clear when I discuss conservatism and minimal truthmakers.

[29] See Ross Cameron (2010) for a discussion of minimal truthmaking.

ontology.[30] In this way, true sentences that report perceptions are made true by minimal truthmakers. Our three theories of composition, when combined with truthmaker theory, would come out as follows:

Nihilism: Only the minimal truthmakers for all true sentences are included in the correct ontology and composite objects are not among the minimal truthmakers. Minimal truthmakers don't have proper parts.

Universalism: Only the minimal truthmakers for all true sentences are included in the correct ontology and for every x and y that is a minimal truthmaker, there is a minimal truthmaker z such that x and y compose z.

Restrictivism: Only the minimal truthmakers for all true sentences are included in the correct ontology. Composite objects are minimal truthmakers only when certain conditions have been met.

The Nihilist truthmaker theorist will claim the sentence 'water molecules exist' is true, but she denies any composite objects, like water molecules, are included in the correct ontology. The sentence, 'water molecules exist', comes out true on this theory because there are certain particles in certain arrangements in space-time. Water molecules are not a part of her ontology because they are not minimal truthmakers. The upshot of this is, when combined with truthmaker theory, Nihilism, Restrictivism, and Universalism can each accommodate almost all of the sentences we consider to fall in our existing knowledge.[31] In this way each theory of composition, when combined with a truthmaker theory, is equally conservative.

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[30] According to the minimal truthmaker, tables and people aren't members of the correct ontology because only particles must be members of the correct ontology for that ontology to be externally consistent. Particles make true all the true sentences that mention 'tables' or 'people', so neither tables nor people are minimal truthmakers.
[31] I add the modifier 'almost' to allow for the inevitability that some of what we consider 'existing knowledge' is false.

This leaves explanatory power and parsimony. Notice that explanatory power overlaps with external consistency when comparing ontologies; both requirements consider how well a theory accounts for the facts. As I've noted, each of the three theories of composition can be articulated so as to be consistent with local matters of particular fact at our world as we know them. Each theory can also account for the empirical facts at our world by making use of truthmaker theory. A Nihilist can claim that the truthmakers for the accumulated empirical knowledge of physics, biology, chemistry, and the special sciences are simples arranged in space-time. In this way she makes true all the truths of the empirical sciences. On this view, there are brute existence facts about simples and their locations in space-time and all other truths either obtain *in virtue* of these brute facts or are truths that don't require truthmakers.[32]

The Universalist and the Restrictivist can act analogously. They may have different things acting as the truthmakers in their theories, but they will claim there are brute facts regarding particles and their arrangements in space-time and these brute facts, perhaps combined with some facts about composition, make true all the truths of the empirical sciences. Each theory either claims that the external facts as elucidated by the empirical sciences are brute existence facts or there are some other facts that are brute and it's *in virtue* of these facts that the external facts are true.

There is an alternative sense of 'explanatory power', according to which one should minimize bruteness and objectionable arbitrariness in a theory in order to maximize explanatory power. At best this requirement would rule out Restrictivism, as it accepts some objects and not

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[32] By calling the existence of a simple a 'brute existence fact' I'm not claiming there aren't causal explanations for the existence of the simple and its location in space-time. I'm only claiming the existence of that simple can't be explained by the existence of its parts.

others. But, if we concede the Restrictivist can give a satisfying response to this charge at our world, Restrictivism draws with Universalism and Nihilism on explanatory power.

In sum, when compared on the grounds of internal consistency, external consistency, testability, fruitfulness, and conservatism the theories are all equally successful at our world. With regard to explanatory power, Nihilism and Universalism are at *least* as successful as Restrictivism at our world, if not more. Nevertheless, in the next section, I argue that Nihilism is the most parsimonious of the three.

2.2 Argument from Parsimony

Philosophers interpret parsimony in different ways. I will present multiple interpretations of the principle of parsimony and demonstrate that no matter which interpretation you accept, Nihilism comes out on top.[33]

> Principle of Parsimony A (PPA): All else being equal, if theory A posits fewer *kinds* of things than theory B, then A is more likely to be true than B.

Universalism and Restrictivism have both composite and simple objects in their ontology, whereas Nihilism has only simple objects. So, in the case of composition, the verdict of PPA turns on whether composite objects are of the same kind as simple objects or not. We have two options, either composites and simples are of different kinds or they are of the same kind. I'll consider each option in turn.

First, imagine composite objects are of a *different* kind than simple objects. If this is the case, then PPA singles out Nihilism, since the other two theories posit both composite objects and simple objects.

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[33] I won't, here, consider the thesis that composition is identity. For an argument against the thesis see Kris McDaniel's (2008, pp. 128-133) *pace* Achille Varzi's (2014, pp. 47-69).

One might respond that the term 'kind' in PPA refers only to *natural* kinds. In this case, Universalism and Restrictivism would, arguably, be as parsimonious as Nihilism. Imagine, for example, a Universalist who argues that composite objects, while of a different kind than simple objects, belong to non-natural kinds and on that basis don't add to the ontological cost of her theory. On this view, PPA would appear to count Universalism and Nihilism as equally parsimonious.

Note this interpretation allows for ontologies to include non-natural kind objects for free. That is, a theory can posit as many non-natural kinds of object as it likes without suffering any disadvantage.[34] But this interpretation fails to get at the theoretical virtue a parsimony principle should get at. The spirit of parsimony is to omit from one's ontology those things that don't do theoretical work. In PPA's case, if all the explanatory work that must be done can be done by a theory that posits fewer kinds of objects, natural or not, then the theory that posits fewer kinds of objects is more likely to be true. Positing non-natural kinds that don't do work is just as bad as positing natural kinds that don't do work. Insofar as parsimony is a theoretical virtue, it should rule out theories that posit ontological kinds beyond necessity. This should include non-natural kinds. To summarize, if we assume simples and composites are of different kinds, PPA dictates we should reject Universalism and Restrictivism in favor of Nihilism.

Imagine now composite objects are taken to be of the *same* kind as simple objects. If we interpret 'kind' as 'natural kind', then we must assume composites are of the same natural kind as simples. There are strong reasons to reject this assumption.[35] The sciences seem to demarcate one natural kind from another; cells are of a different natural kind than electrons, electrons are of

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[34] Thanks to Kris McDaniel for bringing this interpretation to my attention,
[35] My argument that composite objects must be of a different natural kind than simple objects doesn't depend on any particular view of simples.

a different natural kind than quarks, etc. Photons might be of a different natural kind than quarks, but surely neither is of the same natural kind as a cell. When the sciences uncover a smaller particle with different properties than the particles that preceded it, it is marked as a *different kind* of particle.

Consider the discovery of the electron. Scientists considered themselves to have discovered, not just a new particle, but a new *kind* of particle. This gives us reason to think that the fundamental particles at our world (whatever they turn out to be), will be of a different kind than electrons or any other composites. If so, we should take composites and simples to be of different kinds and accept Nihilism for the reasons above.

This response will not satisfy the proponent of *gunk*. In a gunky world every object has proper parts, hence Nihilism is false. However, even if Restrictivism or Universalism espouses gunk, still both theories posit at least two kinds of things instead of a single kind of thing (assuming some proper parts of an object differ in kind from the thing they compose). For example, humans are of a different kind than quarks, which are a different kind than any non-causal proper part of a quark that a gunky theory may posit. In which case, Nihilism is still favored by PPA.[36]

If 'kind' doesn't mean 'natural kind' in PPA and Nihilism, Universalism, and Restrictivism each need only posit one kind of material object, then Nihilism, Universalism, and Restrictivism are all equally parsimonious. However, this entails that simples, humans, and tables are of the same kind in the sense they all are instances of the same kind. In addition, if 'kind' doesn't mean

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[36] If the theory that posits gunk has more explanatory power given results from the empirical sciences, then we wouldn't have most reason to accept Nihilism at our world. The debate would not merely turn on parsimony. I'm assuming the current empirical data *doesn't* support the claim that there is gunk at our world. Perhaps, for example, if everything was easily splittable and new particles were being discovered all of the time, then the empirical data would give us more reason to accept gunk at our world. It's unclear what empirical data would support gunk over simples.

'natural kind', then we need to determine what 'kind' means, why that is the relevant meaning in PPA, and why simples and composites are of the same kind given that fundamental physical particles like quarks play a different causal role than macro-physical objects like organisms. This final point holds even if quarks aren't fundamental physical particles that play the role of simples. Quarks still seem to play a different causal role than organisms. We have inductive reason to think that whatever particles turn out to be in fundamental physics, those particles will play a different causal role than quarks play. In which case, the objects that play the role of simples play a different causal role than any composite object.

A final difficulty concerns the nature of the relationship between an object and the things that compose it. If one posits composite objects, then one must explain this relationship. One might accept an ontological commitment to a composition relation or an ideological commitment to 'composition'. If the former, there is a theoretical cost according to PPA. If the latter, it may give rise to other concerns. (I address ideological parsimony considerations later in the paper.)

Consider an alternative account of the principle of parsimony.

> Principle of parsimony B (PPB): All else being equal, theory A is more likely than theory B to be true if (i) A posits fewer *kinds* of things than B, and if (ii) A posits fewer *individual* things in each kind than B.[37]

As far as condition (i) – qualitative parsimony - goes, I've argued that Nihilism is the most successful of the three theories. But, for the sake of argument, let's assume condition (i) doesn't adjudicate between Nihilism, Universalism, and Restrictivism. PPB will then turn to condition (ii) – quantitative parsimony - to decide between theories. Condition (ii) clearly favors Nihilism since it posits only simple objects as opposed to both all the simple objects along with some

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[37] Daniel Nolan (1997) argues for something like this.

composite objects. This goes also for the proponent of gunk since the thesis of gunk entails an infinite number of objects for every single simple the Nihilist posits.

A third account of the principle of parsimony is as follows:

> Principle of parsimony C (PPC): All else being equal, theory A is more likely than theory B to be true if A posits fewer causally inert or redundant objects than B.[38]

PPC also favors Nihilism over Universalism or Restrictivism. PPC is an injunction against overdetermination, so if particles in space-time can alone account for all the causal events of the world, then PPC dictates we posit only those particles. Analogously, if simples alone can account of all the causal events of the world, then PPC dictates we not posit composites. We might posit either a table (a composite) with those causal powers, or a certain arrangement of particles, which collectively have those powers, but PPC bars us from positing both the table and the particles. To be consistent with contemporary physics, we must posit particles arranged in space-time. However, once we posit the particles there is no causal work left for the table to do. Hence, PPC favors Nihilism.

PPC tells against the proponent of gunk. For every simple posited by the Nihilist, the proponent of gunk must posit infinitely many composite objects (since, on this view every object has proper parts ad infinitum). Given this mass of objects, the gunk theorist must say either only some of them have causal powers or all of them do. If they opt for the former, they run afoul of PPC by positing many objects that are causally redundant. If they opt for the latter, they are forced to claim these properties are emergent. Neither option is palatable, so PPC rules out gunk

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[38] Merricks (2001, p.56-84) endorses a similar principle.

at our world. As Trenton Merricks argues, the causal powers of composite objects (if any such there be) are overdetermined by the causal powers of their constituents.[39]

The final principle of parsimony is as follows:

> Principle of Parsimony D (PPD): All else being equal, theory A is more likely than theory B to be true if A posits fewer kinds of things and fewer kinds of *primitive concepts* than B.[40]

PPD favors Nihilism over Universalism and Restrictivism. Ted Sider argues, "Nihilism also allows us to eliminate the extra-logical (or perhaps quasi-logical) notion of 'part' from our ideology, and this kind of ideological simplification is an epistemic improvement. Nihilism is an ideologically simpler theory, and so is more likely to be true" (2013, p.3).[41] Sider argues, since Nihilism isn't ideologically committed to 'part', Nihilism is more ideologically parsimonious than its competitor theories even if it's on a par ontologically. So, one should accept Nihilism. This argument from ideological parsimony depends on necessary Nihilism. In section 3 I argue we have independent reasons to favor a contingent version of Nihilism over the necessary version.

Necessary versions of Restrictivism and Universalism and a contingent version of Nihilism are on par with respect to ideological parsimony. They all include 'part' in their ideology. However, it's important to distinguish between one's ideological commitments and the portions of one's ideology one must *use* in order to describe a given world. Assuming the more ideology

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[39] Merricks (2001, p.56-84) presents the full argument. He rejects Nihilism as he thinks consciousness is an emergent property. I agree that we should accept objects with emergent properties into our ontology, but I don't think there are emergent properties at *our world*. I think consciousness can be accounted for by the properties of the particles that make up certain brains. I cannot develop this point in the present paper.

[40] This is the kind of principle of parsimony Sam Cowling (2012, p. 3897-3900) and Sider (2011, p.14) have in mind.

[41] Cowling (2012) denies that *composition* is an additional ideological kind. His argument relies on the claims that *identity* and *composition* are of the same kind and all plausible theories must accept *identity* as a primitive ideological commitment. I reject both claims, but I won't discuss Cowling's thesis further here.

one must use to describe a world, the more structure one attributes to that world, the contingent Nihilist attributes less structure to our world (and other relevantly similar worlds) than those that claim the term 'part' is required to fully describe our world (and other relevantly similar worlds). It's not only theoretically desirable to minimize the number of primitive terms a theory contains, but also to be able to fully describe a larger proportion of possible worlds with fewer primitive terms. So, a contingent Nihilism will be more ideologically parsimonious than necessary versions of Universalism or Restrictivism as a contingent Nihilism will allow one to be able to fully describe a larger proportion of possible worlds with a more parsimonious ideology.

Assuming part of the theoretical virtue of parsimony is the ability to fully understand a theory, another reason one might favor ideologically parsimonious theories is to minimize the risk of not understanding the primitive terms a theory posits.[42] A contingent version of Nihilism minimizes that risk more than necessary versions of either Universalism or Restrictivism. The risk of not understanding one's description of a world depends on one not understanding the terms one *uses* to describe that world. Since the contingent Nihilist only *uses* the term 'part' to describe a subset of possible worlds, she only risks not understanding her own description of a subset of possible worlds. Proponents of necessary versions of Universalism and Restrictivism risk not understanding their own descriptions of *every* possible world.

I've argued that Nihilism is more parsimonious than Universalism or Restrictivism on PPA-PPD, so Nihilism is the best theory at our world. Next, I will consider composition at other possible worlds.

2.3 Contingent Composition

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[42] Kris McDaniel (forthcoming) suggests this as his motivation for taking ideological parsimony to be a theoretical virtue (*This is Metaphysics*, chapters 2.10, 4.5).

The argument against Nihilism from the possibility of gunk is as follows:[43]

1. Gunky worlds are possible[44]

2. Gunky worlds are worlds where Nihilism is false

3. Nihilism, if actually true, is necessarily true

4. So: Nihilism is false

While premise two is clearly true, the first and the third premises are debatable. Early Sider (1993) endorses the above argument, while later Sider (2013) argues that since premise 3 is true and Nihilism is true at *our* world, Nihilism is necessarily true and thus gunk is impossible.

Johnathan Schaffer (2003) argues, gunk "passes excellent tests for being possible: it is (a) conceivable, (b) logically consistent, and (c) physically serious" (p. 501). It is conceivable that everything is extended. Everything that is extended can be divided. So, it's conceivable that everything is infinitely divisible. In which case, at least *prima facie*, gunk is conceivable. Schaffer explains "as to logical consistency, there are known models for atomless mereologies, such as that of the regular open sets of a Euclidean space, with parthood taken as set-inclusion for these sets" (p. 501).[45] He argues, Gunk is physically serious because there are physical hypotheses involving infinite division that are taken seriously.[46]

In what follows, I argue we should accept that principles of composition are contingent and reject premise 3.[47] Either the theoretical virtues play a role in determining which theory of

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[43] This is a formalization of the argument given by Sider (1993, 2001: section 5.6) and formalized similarly in J.R.G. Williams's (2006, p. 494).
[44] Schaffer (2003:501), Zimmerman (1996) and Sider (1993) argue gunk is possible. Arntzenius (2008) argues we should take the possibility that this world is gunky seriously. Van Cleve (2008: 325) and Markosian (1998: §4) assume gunk is possible.
[45] Schaffer cites Peter Simons (1987, p. 41) and (David Lewis 1991, p. 20) as labelling atomless entities 'gunk'.
[46] Schaffer cites Leibniz (Letter to Foucher), David Bohm (1957), and Tian Yu Cao and Silvan Schweber (1993) as taking infinite divisibility as a physically serious hypothesis.
[47]Cameron (2007) also argues that composition is contingent. Unlike Cameron, my argument doesn't entail that there are two particle-for-particle duplicate possible worlds where at one world, one theory of composition is true and at the other world, a second theory of composition is true.

composition one should accept or they don't. If the former, then explanatory power plays a role in determining which theory of composition one should accept. In which case, I argue, one should reject Composition Necessitarianism (CN). If the latter is true, then explanatory power doesn't play a role. In which case, I argue in section 2.4, one should reject CN. So, no matter what role the theoretical virtues play, one should reject CN.

Let's first assume the theoretical virtues play a role. As we have seen, testability, fruitfulness, and conservatism cannot help the truthmaker theorist choose between theories of composition. Therefore, we should use the following principle:

> **Epistemic Principle of Composition (EPC)**: The theory of composition one should accept at a world W amongst internally and externally consistent theories at W is the theory that has the most explanatory power and is the most parsimonious.

According to EPC, one should only accept Nihilism Necessitarianism (NN), the theory that Nihilism is true at every possible world, if one should accept that at each possible world W considered on its own Nihilism is true at W.[48] If Nihilism is consistent with all the external facts at each world W, Nihilism is the theory of composition that has the most explanatory power at W, and Nihilism is the most parsimonious at W, then NN is true. If Nihilism is true at our world, gunk is possible, and EPC is true, then NN is false. Even if gunk is impossible, if emergent properties are possible and can only be attributed to single objects, then at emergent property worlds either Restrictivism or Universalism is true. If there are possible worlds that are either gunky or have emergent properties, Nihilism is false at those worlds. Both gunky and emergent property worlds seem possible. Therefore, one should reject NN.

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[48] This exercise is done from *our* world. At our world, one first considers what one should accept at our world (without considering any other possible world), then what one should believe at W1, then at W2, etc. I'm assuming S5 as our modal logic.

The proponent of NN might argue that I'm begging the question against her view. Her position entails that gunky worlds and worlds with emergent properties that must be predicated of a single object are not possible worlds. By assuming these worlds are possible, I beg the question against her. However, I'm not begging the question against the proponent of NN. To maximize explanatory power, we should minimize the number of brute necessities we posit. Without an independent principled reason to reject the possibility of gunk *and* the possibility of emergent properties that must be predicated of a single object, postulating the impossibility of *either* is a brute necessity. In section 2.4 I consider one such principled argument for the impossibility of gunk.

Given EPC, one should also reject Restrictivism Necessitarianism (RN), the theory that Restrictivism is necessarily true. One should only accept RN if at each possible world considered individually Restrictivism is internally and externally consistent and Restrictivism is the theory of composition that tests best against the theoretical virtues. Consider our world. I argued in section 2 even if Restrictivism has the same amount of explanatory power as Nihilism at our world, Nihilism is more parsimonious than Restrictivism and therefore one should accept Nihilism at our world.

Even if Nihilism isn't true at our world, consider a gunky world without emergent properties, W1. Given that W1 is gunky, Nihilism cannot be true at W1. As both Restrictivism or Universalism commit us to composite objects, both theories commit us to positing objects whose causal powers overdetermine the causal powers of the composite objects' proper parts. Consider the following argument for accepting Universalism at W1:

1. W1 is gunky.

2. Universalism or Restrictivism is true at W1 (from 1).

3. Universalism and Restrictivism are both internally and externally consistent and can account for the particular matters of fact at W1.

4. A sorites series of Restrictivist theories can be created from any one Restrictivist theory to a theory of composition that states, for any objects, x and y, in the same space-time, x and y compose a third object, z.

5. There isn't reason to prefer any theory of Restrictivism at W1 to the Restrictivist theory before or after it in the sorites series of Restrictivist theories it occurs in.[49]

6. Any theory of Restrictivism being true at W1 would be objectionably arbitrary (from 4 and 5).

7. Objectionable arbitrariness weighs against a theory's explanatory power (from the theoretical virtues).

8. Universalism isn't objectionably arbitrary at W1.

9. All things considered, one has most reason to accept Universalism at W1 unless parsimony considerations in favor of Restrictivism outweigh the cost of objectionable arbitrariness (from EPC).

10. Parsimony considerations in favor of Restrictivism don't outweigh considerations of objectionable arbitrariness.

11. One has most reason to accept Universalism at W1.

I've explained in section I why 3 is true. 4 is true because one can slightly change any Restrictivist theory to Restrictivist theory*. Restrictivist theory* picks out composites object that are nearly qualitatively identical to those picked out by the original Restrictivist theory. Similarly, one can change Restrictivist theory* to Restrictivist theory** and so on. Eventually

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[49] Sider (2001) defends a similar premise in his Argument from Vagueness (p.120-139).

one will arrive at a theory that states, for any objects, x and y, in the same space-time, x and y compose a third object, z.

The argument for 5 is that for a Restrictivist theory to have as much explanatory power as Universalism, there must be some reason to think some Restrictivist theory is true while Restrictivism* is false. However, given the similarity between the two theories, there isn't reason to think the original Restrictivist theory is true while Restrictivism* is false. For example, there isn't reason to think being caught up in a life is the condition under which composition occurs instead of being caught up in a life*. Life* is a process that differs slightly from life such that the two processes are almost identical. If there isn't reason to prefer one rule of Restrictivism over a slightly different rule of Restrictivism and a sorites series can be created for any theory of Restrictivism, then accepting any single theory of Restrictivism will be objectionably arbitrary. Thus, one has most reason to accept Universalism at W1.[50]

While 6-9 follows if you accept the argument from objectionable arbitrariness, one might reject premise 10. Perhaps parsimony considerations that tell in favor of Restrictivism outweigh the explanatory power lost in the theory's objectionable arbitrariness. If either PPA or PPD is true, then parsimony will not choose between the theories as they both posit composite objects and the primitive ideology of *part*. If PPB is true, then in an important way Restrictivism is more parsimonious. Restrictivism posits fewer composite objects than Universalism. If PPC is true, then one should accept the theory that posits fewer causes beyond necessity. In a gunky world it's difficult to determine what is causal, so I won't state which theory PPC favors except to say since Restrictivism posits fewer composite objects, Restrictivism seems to posit fewer causes beyond necessity.

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[50] This argument is a version of the Argument from Vagueness from Sider (2001), which includes an appeal to the argument from arbitrariness.

However, even if Restrictivism is more parsimonious at W1 than Universalism, it seems the parsimony considerations of the kind described are outweighed by the objectionable arbitrariness entailed by Restrictivism. A theory not having the theoretical prowess to explain why Restrictivism* is true instead of Restrictivism** seems more objectionable than a theory ontologically committed to more composite objects than competitors that share its commitment to composite objects. I'm not going to pursue this further here.

Just as with NN and RN, given EPC, one should only accept Universalism Necessitarianism (UN) if one should accept Universalism at each possible world considered individually. However, as argued in section 2.2, one should accept Nihilism at our world, and therefore reject UN. Even if Nihilism in not true at our world, consider W2.

W2 is gunky and has emergent properties. There are empirically verifiable conditions that nomologically necessitate emergent properties. For example, let's consider a heap of sand. The heap of sand seems to have all of the causal powers that can be accounted for by the causal powers of each particle of sand. In addition, the heap of sand demonstrates an emergent property. It has the property of being 85 degrees Fahrenheit. Each particle of sand by itself just has the property of being the temperature surrounding it, which is 75 degrees Fahrenheit in this instance. No matter how much sand you add to the heap, the heap continues to be 85 degrees Fahrenheit. If you remove one particle of sand at a time, then at the point at which there are only ten million particles of sand left, the heap cools from 85 to 75 degrees Fahrenheit. At W2, there is some evidence best accounted for by a theory of composition that only posits composite things that demonstrate emergent properties. A *heap* of sand is *composed* of over ten million particles of

sand. If temperature change doesn't persuade you of the existence of an emergent property, imagine the pile of sand moves 100 feet or turns blue or both.[51]

At W2, x and y compose iff the composite of x and y instantiates an emergent property, a property that cannot be reduced to x's properties and y's properties working together. The instantiation of emergent properties allows for a Restrictivist theory of composition to avoid the argument from objectionable arbitrariness. According to this theory of Restrictivism, we posit composite objects in order to be able to attribute the emergent property to an object. Perhaps pluralities cannot instantiate properties that cannot be reduced to the cumulative properties of the things making up the plurality. The emergent properties at W2 are irreducible and cannot be accounted for by the cumulative properties of the particles working in concert. Arguments from vagueness cannot be used against this theory of composition. Composition occurs when an emergent property emerges. This isn't a vague condition. Arguments from overdetermination and parsimony don't work against this theory of restricted composition at W2 as composite objects are only posited to account for causal emergent properties. The causal powers of composite objects are not overdetermined by their constituents' causal powers because the causal powers of the composite objects cannot be reduced to the cumulative causal powers of the constituents of the composite object.

One should accept Restrictivism at W2 instead of Universalism since Restrictivism accounts for the evidence of emergent properties in a more parsimonious manner. At least Restrictivism is more parsimonious than Universalism in senses PPB and PPC. Recall at W1 this parsimony consideration was outweighed by arbitrariness, but not so in W2.

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[51]McDaniel (2007) presents a similar argument. Also, I'm assuming sand has emergent properties, so I can count the particles of sand.

In sum, at W2 Nihilism is false as it's inconsistent with gunk. There is some evidence for Restrictivism in the form of empirically verifiable emergent properties that act as boundary conditions for objects. Universalism still falls foul of parsimony arguments. So, one should accept Restrictivism at W2. My argument against Composition Necessitarianism (CN) doesn't depend on the assumption that gunk is possible. If W2 contained simples instead of gunk, one should still accept Restrictivism at W2. Assuming emergent properties must be attributed to a single object, W2 cannot be a Nihilist world and Universalism still falls foul of parsimony arguments. If emergent properties are possible and must be attributed to single objects, then CN is false.

2.4 Gunk

As mentioned above, to maximize explanatory power, we should minimize the number of brute necessities we posit. Without an independent principled reason to reject the possibility of gunk, the impossibility of gunk is a brute necessity. In which case, we should accept that gunk is possible. In what follows, I respond to a principled argument against the possibility of gunk. This argument would serve as an objection to my argument for CN.

Others might argue the methodology I use to argue against CN isn't the correct method of metaphysics. They might endorse the following:

Metaphysics Principle A (MPA): All metaphysical theses, if true, are necessarily true.

They might claim, like explanatory power and parsimony, MPA also plays a role in determining which metaphysical theory we should accept at a world. Given that propositions of metaphysics are necessarily true or false, that Nihilism is a proposition of metaphysics, that Nihilism is true at *our* world, and that Nihilism cannot be true at a world with any gunky objects, it follows that Nihilism is necessarily true and thus gunk is impossible. I'll argue against MPA.

Either MPA is primitive or it's explained by some other principle. It's better to have fewer primitive principles, so including MPA in one's theory may count against that theory. The proponent of MPA can still claim that MPA is an ungrounded principle and challenge competitor theorists to posit a better theory with fewer ungrounded principles that doesn't include MPA.[52] Claiming that MPA is ungrounded is unappealing. Instead the proponent of MPA should ground it in the following two principles.

Independence of Metaphysical Facts (IMF): The local matters of particular fact at any possible world don't make true the metaphysical facts at that world.

Maximize Explanatory Power (MEP): All things being equal, one should accept the metaphysical theory that maximizes explanatory power, thus minimizing bruteness.

The particular matters of fact at a world W don't make compositional facts at W true. Since the particular matters of fact at a world don't make true the metaphysical facts at a world and possible worlds only differ in their particular matters of fact, either a metaphysical theory's being true at a world is a brute metaphysical truth or MPA is true. To minimize bruteness in accordance with MEP, we should accept MPA.

To illustrate, consider two worlds without emergent properties that are, particle for particle, duplicates of one another. The worlds have exactly similar particles arranged in an exactly similar way. Nothing can explain the fact that different metaphysical facts are true at two exactly similar worlds. Given IMF, the reasons to endorse a theory of composition at some world, provide exactly the same reasons to endorse that theory of composition at every possible world. If different theories of composition were true at different possible worlds, then there would be

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[52] One might think a minimal theory of metaphysics will always include MPA, but the reader should note that the theory of metaphysics this paper employs doesn't appeal to MPA.

unnecessary bruteness. To purge this unnecessary bruteness, in accord with MEP, one should accept that whichever theory of composition is true is necessarily true.

However, in response, while IMF might be true for some metaphysical facts, it's not true for compositional facts, as explained above. Distributions of emergent properties, like distributions of other properties, are local matters of particular fact. If emergent properties are merely possible and emergent properties must be predicated of single objects, then it seems that local matters of particular fact make true compositional facts. The distribution of emergent properties at W makes true some compositional facts at W. Note that it needn't be possible that there are particle for particle duplicate worlds with different distributions of emergent properties, it need only be the case that at some possible world there are emergent properties. So, unless there is a principled reason to reject the mere possibility of emergent property worlds, one should accept their possibility to minimize bruteness.

Even if the possibility of emergent properties doesn't convince you that IMF isn't true for compositional facts, you should still reject MPA. In order to motivate MPA we relied on IMF and MEP. However, MEP gives us reason to ultimately reject MPA. In order to adhere to MEP, we should minimize brute metaphysical necessities and brute metaphysical truths, *ceteris paribus*.

X is a **brute metaphysical truth** iff a pair of particle for particle duplicate worlds can disagree on X.

X is a **brute necessity** iff X is true at every possible world and there is no reason that X is true at every possible world.

An example of a necessary fact is that 2+2=4, but this necessary fact isn't brute. One can appeal to the law of non-contradiction, some axioms in first-order logic, along with some definitions

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and axioms in set theory to explain why 2+2=4. The law of non-contradiction might be a brute necessity. If one is motivated by MEP and considers minimizing bruteness to be a part of what it is to maximize explanatory power, then one has reason to minimize brute necessities and reject MPA.

Now, even if IMF is true for compositional facts, I will argue, given MEP, you should reject MPA. Consider CN. Assume that gunk is impossible and emergent properties are impossible, such that compositional facts are independent of the particular matters of fact at possible worlds. It follows directly from MEP and the facts at each possible world that whichever theory of composition is true at some possible world, that theory is true at every possible world. This is because one need only look at each possible world to know that there are no particular matters of fact that could explain the difference in compositional facts between possible worlds. MPA is theoretically superfluous. In order to minimize positing brute necessities, the proponent of CN should appeal to the minimal set of necessary facts, which doesn't include MPA.

In addition, we have no reason to think that there aren't other metaphysical facts that differ from world to world. Perhaps either Physicalism or Humean Supervenience is a contingent metaphysical doctrine. Either way, to minimize positing brute metaphysical necessities, one should reject MPA. The metaphysical facts must be considered individually with the modal status of each given careful consideration. If we disagree about the modal status of compositional facts, it should be because we disagree about the possibility of gunk or the possibility of emergent properties that need to be predicated of a single object.

I've now argued, if the theoretical virtues play a role in determining which metaphysical theory we should accept at a world, then we should accept composition is contingent and therefore the possibility of gunk doesn't preclude the truth of Nihilism at our world. Also, I've

argued, even if you accept CN, if you accept MEP, then you should reject MPA. The reasons for accepting CN should appeal to the impossibility of emergent properties, gunk, or other particular matters of fact that might make a difference as to what theory of composition one should accept at some possible world.

I will now argue even if the theoretical virtues don't play a role in determining which theory of composition we should accept, one should also reject CN. Without the theoretical virtues, only internal and external consistency can help us determine which theory of composition to accept. As discussed in 1, there are internally consistent versions of Nihilism, Universalism, and Restrictivism. Gunk is an internally consistent theory of decomposition. Worlds where either Restrictivism or Universalism is true may each be consistently described as gunky worlds.

Since gunk and Nihilism are both internally consistent theories and are each consistent with the particular matters of fact at some possible world, there is nothing to rule out one possible world that is gunky and another where Nihilism is true. So, we should reject that the possibility of gunk precludes the possibility of Nihilism.

I've now argued that given the aforementioned methodology, we should accept Nihilism at our world, reject CN, and deny that the possibility of gunk precludes the truth of Nihilism at our world. Finally, even if you oppose the use of the theoretical virtues, you *still* should deny that the possibility of gunk precludes the truth of Nihilism at our world.[53]

Chapter 3

Objects and Simples: The Nomological Account

Peter Van Inwagen (1990) famously posed the "Special Composition Question" (SCQ),
which asks what the necessary and jointly sufficient conditions are under which two or more
objects come together to compose a further object. The SCQ isn't asking for an analysis of the
concept of composition, rather the SCQ asks for an account of how the concept of composition is
related to non-mereological concepts. There are three general answers to the SCQ. Mereological
Universalists argue that composition always occurs, Mereological Restrictivists argue that
composition occurs under some circumstances but not others, and Mereological Nihilists argue
that composition never occurs. Ned Markosian (1998) posed a related mereological question, the
"Simple Question" (SQ) which asks what the necessary and jointly sufficient conditions are for
being a simple. The SQ isn't asking for an analysis of the concept of a simple. A *simple* is an
object without proper parts. The SQ is asking how the concept of a simple links up with non-
mereological concepts. For instance, perhaps simples are point-sized, or simples instantiate a
single property, or simples are maximally connected at a world.[54] Or, perhaps there aren't
necessary and sufficient conditions for being a simple.[55] In this paper, I ask another related
question. Within the domain of the physical, what are the necessary and jointly sufficient
conditions for being an object? I'll call this the "Object Question". In this paper I'll argue for
what I'll call the 'Nomological Account of Objecthood' or 'NAO' for short. If I'm right, NAO
answers the SCQ and SQ.

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[54] Ned Markosian (2004) argues that simples are maximally connected objects.
[55] McDaniel, Kris (2007b).

To state NAO, I'll introduce two terms: *conceivable proper parts* and *causally non-redundant.* Merely *conceivable parts* and *conceivable objects*, etc. don't *really* exist, but we can learn to use both terms and speak of them as though there were such things. Our talk of *conceivable proper parts* and *conceivable objects* is made true by recognized geometrical figures that are carved out by geometrical divisions of either Euclidean or Non-Euclidean geometries. As a toy example, consider the term 'trout-turkey'. A trout-turkey is a conceivable object that is composed of the detached front half of a trout and the detached back half of a turkey. We can learn to use the term 'trout-turkey' even if we don't believe there are such things. Our talk of trout-turkeys is made-true by trout and turkeys. So, we can say true things that include the term 'trout-turkey', even if there aren't *really* any trout-turkeys.

Just as we can discuss merely conceivable composites like 'trout-turkeys', we can also discuss merely conceivable parts. Consider a hunk of wood. Let's call it 'Hunky'. Before you carve Hunky, you can discuss the cubed-hunks or spherical-hunks you could carve from Hunky. We can say true things about shaped-hunks that could be carved from Hunky, *conceivable carvings*, whether or not they *really* exist. While we physically cannot carve out one or two-dimensional objects, we can say true things about the lines and squares of wood that could conceivably be cut from Hunky. Certain areas of pre-carved Hunky make our talk of a sphere carving true. For example, a certain area of Hunky makes-true 'there is a sphere with a 2-foot radius'. Like conceivable carvings, we can say true things about conceivable proper parts whether or not proper parts *really* exist. For example, a certain area of Hunky makes-true 'there is a square-inch part of Hunky'. Just as certain areas of pre-carved wood make talk of possible carvings true, a simple that *really* exists can make-true talk of the conceivable proper parts of said simple. Note that *real* objects are also conceivable objects. Since *real* objects are also

geometrical figures that geometrical divisions of either Euclidean or Non-Euclidean geometries can carve out, *real* objects are also conceivable objects. For instance, assuming Hunky *really* exists, Hunky is a conceivable object and a *real* object.

A conceivable object O is *causally non-redundant* at a world W iff at some world nomologically accessible to W, O makes a difference at that world. O makes a difference at a world iff O influences at least one extrinsic event at that world and O's influence on that extrinsic event isn't a duplication of the influence that another conceivable object or conceivable objects have on that extrinsic event. Extrinsic events are events that are not exclusively within that object's region. So, a conceivable object O is *causally non-redundant* at W iff at some world nomologically accessible to W, O makes a difference to the events at W that are not exclusively within O's region.

I can now state the Nomological Account of Objects (NAO):

A *conceivable object* O is an **object** at some possible world W iff O is *causally non-redundant* at W or worlds nomologically accessible to W.

To state NAO in more simple terms, A *conceivable object* O is an **object** at some possible world W iff O makes a difference to the events that are not exclusively within O's region at W or at worlds nomologically accessible to W.

In this paper I assume that the best theory is internally and externally consistent and best exemplifies the theoretical virtues. I use this methodology to argue for NAO. Apart from the aforementioned methodology, I am also assuming that simples are possibly extended objects.[56]

I'll appeal to parsimony and explanatory power to argue for NAO at different kinds of possible worlds that have objects. My plan is to first discuss a non-gunky world without

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[56] McDaniel (2007a & 2009), Peter Simons (2004), and David Braddon-Mitchell and Kristie Miller (2006) argue for the possibility of extended simples.

emergent properties, W_1. A gunky world is a world with only gunky objects. An object is gunky iff it has proper parts and its proper parts have proper parts *ad infinitum*. At gunky worlds there aren't any objects without proper parts, i.e. there aren't any simples. At W_1 there aren't any gunky objects. In addition, at W_1 there aren't any emergent properties – properties that cannot be reduced to the properties of a single simple or the properties of simples working together.

To explain what objects exist at W_1, I'll first introduce the terms *nomologically co-involved* and *nomologically independent (n-independent)*. Two conceivable objects O^1 and O^2 are *co-involved* at a world iff at that world O^1 and O^2 are involved in all of the same extrinsic events. Two conceivable objects O^1 and O^2 are *nomologically co-involved* iff at all nomologically possible worlds, O^1 and O^2 are involved in all of the same extrinsic events. To illustrate, consider a conceivable object, O. Call O's conceivable top half 'Toppy' and O's conceivable bottom half 'Bottomy'. If Toppy interacts with something outside of O, then Toppy and Bottomy aren't *nomologically co-involved*. If Toppy and Bottomy are *nomologically co-involved,* then Toppy doesn't interact with anything outside of O without Bottomy at any nomologically possible world and Bottomy doesn't interact with anything outside of O without Toppy at any nomologically possible world. A conceivable object O is *nomologically independent (n-independent)* iff it isn't nomologically co-involved with any other conceivable object <u>that isn't a conceivable proper part of O</u>. The addition of the underlined clause allows for extended n-independent conceivable objects. Otherwise, even causally redundant conceivable proper parts of a conceivable extended object would automatically render the conceivable extended object not n-independent.

In 3.2, I'll argue that at W_1 our best theory posits a conceivable object O iff O is n-independent. I'll then argue that this theory combined with the standard definition of

simplehood, i.e. that simples are objects without proper parts, gives us the Nomological Account

of Simples (NAS).

 NAS is as follows:

 Object O is a **simple** iff it is a *nomologically independent (n-independent)* object.

I take *our* world to be a non-gunky world without emergent properties, but my arguments don't

hang on this assumption.

 In 3.3, I'll turn to a non-gunky emergent property world, W_2. If pluralities can instantiate

emergent properties, then I'll argue that, like at W_1, only n-independent objects exist. If

pluralities cannot instantiate emergent properties, I'll argue that at W_2 our best theory posits a

conceivable object O iff O is n-independent or O instantiates an emergent property. If this is

correct, we should posit composites as well as simples at W_2. But, I argue, we should still accept

NAS. Non-gunky worlds without emergent properties and non-gunky worlds with emergent

properties carve up the space of all possible worlds with simples.[57] So, if the best account of

simples is the same at each of the two kinds of possible worlds with simples, as I'll argue, then

we have found the best theory of simples at all possible worlds.[58] I'll then show that the property

that n-independent objects and objects with emergent properties have in common is that they are

causally non-redundant. So, we should accept NAO. It shouldn't be surprising that a

methodology that values parsimony picks out causal non-redundancy as the criterion for

existence.

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[57] There are also possibly mixed worlds. Mixed worlds may contain gunky and non-gunky objects and objects with
and without emergent properties. If NAO and NAS are true at non-gunky worlds without emergent properties, non-
gunky worlds with emergent properties, and gunky worlds with and without emergent properties, then NAO and
NAS are also true at all mixed worlds. My arguments can be easily applied to most mixed worlds. I will discuss
gunky worlds without emergent properties in IV.
[58] One might think that there are possible worlds with simples and objects, but without causal connections. In
addition, depending on what one thinks about laws and about the relationship between laws and causation, one
might think that a world without causal connections is a world without laws of nature. In which case, neither NAO
nor NAS can be true these worlds. I'm inclined to say worlds without causal connections don't exist.

In 3.4, I'll turn to gunky worlds with emergent properties. I'll briefly show that NAO parsimoniously accounts for gunky worlds with emergent properties. Finally, I'll discuss gunky worlds without emergent properties. As stated, NAO leaves us with a puzzle regarding the possibility of gunky worlds without emergent properties. I'll end my paper with a brief discussion of the puzzle.

3.1 Method

Let's consider each of the aforementioned criteria i)-iii). A theory is *internally consistent* iff it's consistent *with itself*. In contrast, a theory is *externally consistent* iff it's consistent with the rest of the world or with the facts. I'll take this to mean, a theory is externally consistent with the facts at some possible world, W, when it consistent with the local matters of particular fact at W.[59] By local matters of particular fact I mean the particle distribution at W that all plausible theories accept. In worlds without particles, a theory must be consistent with, for instance, the distribution of waves, fields, or properties at W.

Our third criterion is (iii): exemplification of the theoretical virtues. I understand the relevant theoretical virtues for a theory of objects or simples to exclude virtues that measure the extent to which a theory is empirically testable. Thus, for our purposes they include:

- *Conservatism*: the extent to which a theory allows us to maintain considered existing beliefs.

- *Explanatory Power:* the extent to which a theory can explain the way things are in the world and the extent to which that theory is brute.

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59 I'm using the phrase 'local matters of particular fact' in the same manner as David Lewis. Lewis explains "all there is to the world is a vast mosaic of local matters of particular fact, just one little thing after another…we have a geometry: a system of external relations of spatio-temporal distance between points, maybe points of space-time itself, maybe point sized bits of matter, or aether or fields, maybe both. And at those points we have local qualities. And that is all. There is no difference without a difference in the arrangement of qualities" (1986b, p. ix-xi).

- *Parsimony:* the extent to which a theory minimizes the number of things or the numbers of kinds things a theory is committed to.

So, of the internally and externally consistent rival theories at some possible world, W, we should accept the theory with the best combination of the above three.

First, there is a virtue of maintaining considered existing beliefs, but this is not quite as restrictive as it might first seem. For instance, suppose we learn to use the word 'trout-turkey' to say true things. Once we believe these truths, expressing them with the word 'trout-turkey,' conservatism tells us that our best theory should not lead us to give up these beliefs without good reason. These beliefs can be maintained by a theory that posits trout and turkeys. The theory does not have to add a further object that is above and beyond the trout and the turkeys, because there are rules that tell us how to move from truths about trout and turkey to utterances using the term 'trout-turkey.'[60] This point generalizes to apply to any ontological theory that provides a sufficient basis for formulating all of our current true beliefs.

Merely conceivable carvings and trout-turkeys don't *really* exist, I say, because they aren't mentioned by the best theory of our world. There are a bunch of properties smeared about spacetime. There are a variety of ways to carve-up property-smeared spacetime into objects. The carving that yields the best theory carves out the objects that *really* exist. I call the objects carved out by the best theory 'minimal truthmakers'.

The minimal truthmakers are members of the minimal set of objects that must *really* exist to make-true all true sentences that require truthmakers. Ross Cameron (2010) explains, "an ontology lacking in Xs can nonetheless make true sentences proclaiming the existence of, or attributing features to, the Xs. The thought is that the ontological commitments of a sentence are

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[60] As long as we can apply these rules such that we can use and refuse the use of the relevant terms, we need not be able to articulate the rules.

those entities that are needed as truthmakers for the sentence" (p. 249-250). The only objects that are members of the correct ontology, the only objects that *really* exist, are objects that are minimal truthmakers.

Minimal truthmakers can make-true sentences that mention conceivable objects like conceivable carvings and trout-turkeys. So, for example, to resist commitment to carvings of merely conceivable spheres or trout-turkeys, I needn't accept the falsity of sentences mentioning 'sphere carvings' or 'trout-turkeys'. Rather, I can show that sphere carving talk can be made true by somethings besides sphere carvings and trout-turkey talk can be made true by something other than trout-turkeys. For instance, Hunky can be the truthmaker for talk of spherical-shaped carvings and a trout and a turkey can be the truthmaker for trout-turkey talk. For the Mereological Nihilist (henceforth, nihilist), for example, simples arranged in spacetime make-true composite-talk such as table-talk. For the proponent of extended simples, conceivable carvings of a simple can make-true talk of parts of said simples. As discussed above, talk of a square part of a spherical simple can be made true by a conceivable square carving of that simple. So, the proponent of minimal truthmaking and extended simples can preserve considered existing beliefs without bloating her ontology. She can claim that there is true talk of parts of simples as long as there are rules that tell us how to move from truths about simples to utterances using the term 'part of a simple'.

With a clearer understanding of conservatism, let's turn to explanatory power. There are two measures that matter in determining the extent of a theory's explanatory power. The first overlaps with external consistency when comparing ontologies as it requires a theory be consistent with the facts. In addition, the first measures how well a theory accounts for the facts.

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The second measures the extent to which a theory minimizes bruteness and objectionable arbitrariness. The less brute a theory is, the more explanatory power a theory has.

The arguments in this paper will follow if either of the following two principles of parsimony is correct. I leave it open what the relationship is between these principles. So, I'll motivate each of the two principles. The first principle I'll consider is the Principle of Qualitative and Quantitative Parsimony (QQP):

> QQP: All else being equal, theory A is more likely than theory B to be true if (i) A posits fewer *kinds* of things than B (qualitative parsimony), and if (ii) A posits fewer *individual* things in each kind than B (quantitative parsimony).[61]

I'll take clause (i), qualitative parsimony, as needing no argument. One reason to favor QQP over a merely qualitative principle of parsimony is that QQP can account for our intuitions regarding the following example as well as scientific practice in the following kind of example. Imagine that scientists observe a planet's movement through space. The movement of the planet, planet A, indicates that there is some large gravitational force acting on the planet. The force acting on planet A is large enough that a medium sized planet a certain distance from planet A would account for the movement of planet A.[62] There is no known planet whose gravitational force could be the cause of planet A's movement. In order to explain planet A's movement scientists must posit one or more new planets. Planet A's movement could be explained by positing 1 additional planet that exerts some gravitational pull on planet A, or by positing 2 additional planets that each exerts some lesser gravitational pull on Planet A, or by positing n

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[61] Daniel Nolan (1997) argues for something like this.
[62] Alan Baker (2003) gives this example in "Quantitative parsimony and Explanatory Power". He uses it as an example of the application of the quantitative principle or parsimony that is *not* what he calls an *additive* case. In the paper he merely defends the application of parsimony in *additive* cases. Baker notes that he does think that quantitative parsimony is justified in the planet example, but he doesn't offer a justification in the paper (p. 257).

planets each of which exerts some gravitational pull such that when added up the gravitational pulls explain the movement of planet A. I think it is most plausible that it is 1 planet acting on planet A. If you prefer a merely qualitative principle and you think that it is more plausible to posit 1 planet in this example than it is to posit 100 planets, then you must explain why quantitative parsimony matters in the example above and not in general.

In addition, consider the following sketch of an inductive argument. If it is the case that in the history of scientific discovery there are many cases of confirmed hypotheses that appeal to quantitative parsimony, then the history of scientific practice would give us inductive evidence that quantitative parsimony is a theoretical virtue. While I cannot provide a sufficient number of cases to support the inductive argument, I can point to three cases. Consider the discovery of the planet Neptune. Neptune was discovered in the same manner as planet A. In 1845 Urbain Le Verrier and John Couch Adams both independently predicted the existence of a single planet to account for the irregularities when predicting the existence of multiple planets in certain locations would have accounted for the irregularities just as well. Their predictions were confirmed when Neptune was observed via telescope in 1846.[63] Daniel Nolan (1997) argues scientists employed quantitative parsimony in their discovery of the neutrino particle. Nolan (1997) also argues Avogadro's hypothesis that "molecules such as oxygen, nitrogen, and hydrogen all contain two atoms" employed quantitative parsimony (p. 337). While hypothesizing that a molecule of oxygen contains any multiple of two would have accounted for the data, "Avogadro assumed the minimum number of atoms in each element to explain the new volumes discovered" (p.337).

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[63] Kollerstrom, N. (2001). "Challis' Unseen Discovery". *The British Case for Co-prediction.* University College London. Archived from the original on 2005-02-06. Retrieved 2016-03-27.

Alternatively, one might think that the principle of parsimony isn't about numbers of kinds of objects or of objects. Instead one might endorse the Causal Principle of Parsimony (CP).

> CP: All else being equal, theory A is more likely than theory B to be true if A
>
> posits fewer causes beyond necessity, fewer causally inert objects, or fewer
>
> causally redundant objects than B.[64,65]

One might argue that the point of parsimony is to not posit any entity that doesn't do any theoretical work for us. The only work that needs to be done once we understand how the aforementioned truthmaker strategy works is causal work.

So, the best theory of objects at a world is the most parsimonious theory that can account for the facts with minimal bruteness. In the next section, I'll use QQP and CP to argue that at non-gunky worlds without emergent properties, only n-independent objects exist.

3.2 Non-Gunky Worlds Without Emergent Properties -W_1

First, I'll argue that if you accept the aforementioned methodology, you should accept that only n-independent objects are minimal truthmakers at W_1. I then argue, n-independent objects are simples, so NSA is true at W_1.

I'll use three cases to argue that the best theory of W_1 will only mention an object O if O is an n-independent object. This is because all the work is done by O, so there is no work left for O's conceivable proper parts to do. Consider some conceivable object Brangelina at W_1. Consider two conceivable proper parts of Brangelina, Brad on the top and Angelina on the bottom. Assume that at W_1 and all worlds nomologically accessible to W_1 if any conceivable proper part of Brangelina is involved in an external event, then the conceivable remainder of

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[64] Merricks (2001, p.56-84) endorses a similar principle.
[65] CP state 'fewer causes beyond necessity' instead of 'no causes beyond necessity' because there might be reasons to posit some causes beyond. For instance, we may posit a cause beyond necessity to minimize bruteness.

Brangelina is also involved in the same external event. So, if Brad is involved in an external event, then Angelina is involved in the same external event and vice versa. Brad and Angelina are nomologically co-involved.

For a toy example, imagine an electrical outlet like the one pictured below in image 1.

Image 2[66].

Call the top outlet Brad and the bottom outlet Angelina. From just looking at the image, it may seem as though Brad and Angelina work independently. Brad charges things plugged into the top outlet. Angelina charges things plugged into the bottom outlet. But, let's imagine that this electrical outlet works in the following way. Electricity enters via the hot wire on the brass screw side of the outlet (the screws on the right side). Electricity flows everywhere there is continuous metal which includes both brass screws and both outlet inserts and the appliance if one is plugged in. The electricity then flows back through the appliance (if one is plugged in) and then through the silver screws (the screws on the left side) and leaves through the neutral wire on the left side back through the house to the breaker box. The top half, Brad, and the bottom, Angelina, are always both involved in the process of providing electricity to an appliance whether or not the appliance happens to be plugged in on the bottom or the top. Brad and Angelina are both

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[66] https://www.homedepot.com/p/Leviton-15-Amp-CO-ALR-Duplex-Outlet-Ivory-R51-12650-00I/100357026=cartoon%20of%20electrical%20outlet&ved=2ahUKEwiN7f6nkdbZAhVqg-AKHQH3C4s4yAEQMygIMAh6BAgAEAk&iact=mrc&uact=8 , (retrieved 6/6/18).

involved in every instance. If the outlet works as described, then we can more parsimoniously describe the workings of the outlet by only mentioning the entire outlet, call it Brangelina, both bottom and top. Brangelina provides electricity to appliances plugged into the top or bottom.

In this toy example there is no external event that the best theory of W_1 would have to account for in which Brad is involved and Angelina isn't or vice versa. A theory that mentions only Brangelina can account for all of the same external events as a theory that mentions Brad and Angelina, but the theory that only mentions Brangelina accounts for the same external events at W_1 in a more parsimonious manner. Positing Brangelina instead of Brad and Angelina is more quantitatively parsimonious and more causally parsimonious. A theory that posits Brangelina instead of Brad and Angelina not only posits fewer objects, it posits fewer causes beyond necessity. While positing either Brangelina or Brad and Angelina can both account for the external events at W_1, by only positing Brangelina, a theory posits fewer causes beyond necessity by positing one cause instead of two. The same is true of theories that mention any of the other conceivable proper parts of Brangelina. As stipulated, there is no world that is nomologically accessible to W at which Brangelina or any of its conceivable parts are involved in different external events. The theory that only mentions Brangelina accounts for the same external events in a more parsimonious manner than a theory that also mentions any of Brangelina's conceivable proper parts.

I've argued that Brangelina can do all of the causal work of any of its conceivable parts. I'll now argue that all non-causal work can be done by minimal truthmaking without further bloating our ontology. A theory ought to not only have the theoretical resources to describe all events at a world; it should also be able to explain how much of our talk is true.[67] There are practical

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[67] Our talk should come out true or at least truth-apt or assertable. If Brad isn't a member of the correct ontology, then 'Brad is the top outlet plug' should be truth-apt or assertable, unlike 'there are unicorns'.

reasons that one may wish to discuss Brad or Angelina. Let's return to our toy example. There are reasons to distinguish between the top and the bottom plug. You might want to tell someone to use the bottom plug to charge their appliance because you are using the top plug. It might *seem* like we must posit Brad and Angelina in order to make sense of successful communication about the top and bottom plugs. However, as discussed above, we can mention the conceivable parts of Brangelina, without positing those conceivable parts. Brangelina is the minimal truthmaker for our talk of both Brad and Angelina. We can learn to use the term 'Brad' when referring to the top half of the outlet, Brangelina, as viewed from a certain perspective as represented in Image 1. We can first agree to overlay some specific conceivable coordinate system, such as a cartesian plane, atop the outlet represented in Image 1 as represented below.

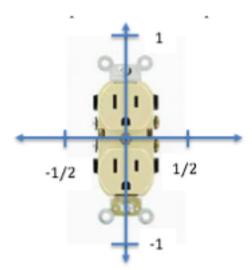
Image 3

We can then agree to use the term 'top' and 'bottom' such that the 'top' refers to the conceivable portion corresponding to the more positive numbers of the overlying conceivable coordinate system relative to the other conceivable portions. Finally, we can agree to use 'brad' to refer to the top half of Brangelina. 'You should plug into the bottom plug' is made-true by the fact that a

person wants to charge an appliance in that outlet and the top conceivable half is already occupied by a different appliance.

This is similar to the more familiar nihilist claim that the simples arranged person-wise together act as a truthmaker for 'that person is conscious'. The claim is that the simples and their fundamental properties work together such that it's true to call that person conscious. I'll call this 'bottom-up truthmaking' since the bottom entities (simples) are doing the work instead of the top entities (people). Assuming the outlet is a simple, the sentence 'the top plug is occupied' is made-true by the conceivable top-half carving of Brangelina and the appliance that is plugged-in. I'll call this top-down truthmaking. The top entities (Brangelina) are doing the work instead of the bottom entities (Brad or Angelina). Carvings of simples make-true part-of-simple-talk just like arrangements of simples make true composite-talk. The sentence about the outlet mentions a conceivable smaller part, Brad, and is made true by a larger object, Brangelina, and the nihilist's claim mentions something larger, a conscious person, and is made true by smaller things, simples working together. Just as the nihilist sees no reason to make the person an ontological posit just because we can truly speak about the person, I see no reason to posit Brad or Angelina just because we can truly speak about them.

Since all of the work, causal and non-causal, can be done by Brangelina alone, our best theory of W_1 will only posit Brangelina. Given that Brad could be any conceivable object that is nomologically co-involved with another conceivable object that isn't a conceivable proper part of Brad, such as Angelina, the following general principal follows from the above argument. If O^1 is nomologically co-involved with O^2 and O^2 isn't a conceivable proper part of O^1, then our best theory shouldn't posit the real existence of O^1.

While the case of Brangelina shows that we *shouldn't* posit the real existence of two or more conceivable objects that are nomologically co-involved, the following two cases show that we *shoul*d posit the real existence of n-independent conceivable objects. The second case involves a second conceivable object at W_1, Speidi. Let's assume that the conceivable left and right halves of Speidi, Spencer and Heidi respectively, are involved in different external events at W_1. This is similar to the trout-turkey example. The top half of the trout is involved in different external events from the bottom half of the turkey. The top half of the trout swims upstream while the bottom half of the turkey wanders in a field. Similarly, Spencer is involved in external events at W_1 that Heidi isn't involved in and vice versa. In addition, let's assume that all of Spencer's conceivable proper parts are nomologically co-involved and all of Heidi's conceivable proper parts are nomologically co-involved. So, to accurately describe all of the events at W_1 we need to posit both Spencer and Heidi because there are some events that Spencer is involved in that Heidi isn't involved in and vice versa. However, we needn't posit Speidi as we can account for all the external events at W_1 by just appealing to Spencer and Heidi.

Let's turn to the third case. Consider a third conceivable object at W_1 that is intrinsically qualitatively identical to Speidi, Bennifer. Let's say that two conceivable objects are intrinsic qualitative duplicates iff there is a one-to-one correspondence between their conceivable parts that preserves all fundamental qualitative properties and relations and the conceivable part-whole relation.[68] Let's call the right half of Bennifer 'Jennifer' and the left half 'Ben'. Let's also assume that the conceivable proper parts of Jennifer are nomologically co-involved and the conceivable proper parts of Ben are nomologically co-involved. At W_1, Ben and Jennifer are involved in all of the same external events.

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[68] This is essentially the definition from Lewis (1986a: 61). The formulation is drawn from Bricker (1993: 274, 1996:227). I replaced 'part' with 'conceivable part' and 'object' with 'conceivable object'.

I'll now argue, while we can describe every external event that occurs at W_1 by merely positing Bennifer, the theory of W_1 with more explanatory power posits Ben and Jennifer instead. A theory that merely posits Bennifer entails the brute fact that Spencer and Heidi *aren't* nomologically co-involved and Ben and Jennifer *are* nomologically co-involved. This fact is brute because Speidi and Bennifer are intrinsically qualitatively identical. So, to maximize explanatory power, the best theory of W_1 posits both Ben and Jennifer even though Ben and Jennifer are involved in all of the same external events at W1. The real existence of Spencer and Heidi at W_1 is strong evidence that there is a nomologically possible world in which Ben and Jennifer aren't co-involved. If there are two conceivable intrinsically qualitatively identical objects at a world and the conceivable proper parts of one of the conceivable objects are co-involved at that world and the conceivable proper parts of the other conceivable object aren't co-involved at that world, then we should accept that neither sets of conceivable proper parts are nomologically co-involved. In addition, the best theory of W_1 doesn't posit Bennifer in addition to Ben and Jennifer because a theory that only posits Ben and Jennifer can account for all of the external events at W_1 more parsimoniously. So, Ben and Jennifer appear in the best theory of W_1 and Bennifer doesn't.

The third case shows the following. If two conceivable proper parts, P^1 and P^2, of a conceivable object, CO^1, are co-involved at W_1, and if there is an intrinsically qualitatively identical conceivable object, CO^2, whose conceivable proper parts, P^3 and P^4, aren't co-involved at W_1, then we should posit the real existence of P^1 and P^2 instead of CO^1. This is because CO^2, P^3, and P^4 give us good reason to think that while P^1 and P^2 are co-involved at this world, there is a nomologically accessible world at which P^1 and P^2 aren't co-involved. The existence of CO^2 shows us that CO^1 is similar to the Speidi case rather than the Brangelina case.

Given that Spencer, Heidi, Jennifer, and Ben could each be any conceivable n-independent object O, the following general principle follows. If there is a conceivable n-independent object O, then our best theory should posit the real existence of O.

Our best theory at W_1 posits Ben, Jennifer, Spencer, Heidi, and Brangelina and doesn't posit Bennifer, Speidi, Brad, or Angelina. Thus, at any non-gunky world without emergent properties, the best theory will posit the real existence of a conceivable object O iff O is an n-independent object.

To summarize, consider the following argument. O^1 and O^2 are conceivable objects.

(1) If O^1 is not n-independent, then our best theory shouldn't posit the real existence of O^1. (Supported by the Brangelina case.)

(2) If O^2 is n-independent, then our best theory should posit the real existence of O^2. (Supported by the Speidi and Bennifer cases.)

(3) Therefore, our best theory should posit the real existence of a conceivable object O, iff O is n-independent. (from 1 and 2).

Thus far I've only argued that the best theory of W_1 posits a conceivable object O iff O is n-independent. In 3 I'll explain why we should accept NAO at W_1 instead of merely accepting n-independence as the criterion of objecthood.

I'll now argue that O is an n-independent object iff O is a simple. The right to left-half reading of the biconditional is trivially true because I have just shown if anything exists at the world it is n-independent. So, I'll now consider the other direction. N-independent objects are either simple or composite. If we claim that n-independent objects whose conceivable proper parts are nomologically co-involved are composites, then, in keeping with the definition of composite, we must include the proper parts of the composites in our ontology. But, the parts

cannot do any causal work if they are merely conceivable proper parts of composites whose conceivable proper parts are nomologically co-involved. If we posit Brangelina, there is no reason to posit Brad and Angelina as Brangelina does all the causal work to be done. So, including Brad and Angelina as simples in our ontology will give us a theory that posits objects that don't do any causal work that isn't already being done by the composite, Brangelina. The theory that tests best against the theoretical virtues *only* posits the most parsimonious set of objects whose conceivable proper parts are nomologically co-involved. In which case, our best theory doesn't posit the conceivable proper parts of objects whose conceivable proper parts are nomologically co-involved. Our best theory doesn't posit Brad and Angelina, so Brad and Angelina can't be proper parts of Brangelina. Brangelina isn't a composite. So, Brangelina is a simple. Thus at W_1, O is a simple iff O is n-independent. NAS is the best account of simples at W_1.

This has the consequence that just because something is a simple at one world doesn't mean it's a simple at a world with different laws of nature. Consider a simple at this world, S. Now if we consider an intrinsic qualitative duplicate of S at a possible world with different laws of nature, S need no longer be a simple. Given the different laws of nature it might be that at this second world, S's conceivable proper parts are involved in different events. In which case, according to the best theory at this possible world S isn't an object and S isn't a simple. In addition, note that all the simples in the same world needn't be the same size. As long as all of their conceivable proper parts are nomologically co-involved, they are both simples.

3.3 Emergent Property Worlds

The aim of this section is to show that if there are emergent property worlds, then we shouldn't only posit n-independent objects, we should also posit composite objects with

emergent properties. So, while we should accept that simples are n-independent objects, objects are either n-independent or have emergent properties. The commonality between n-independent objects and objects with emergent properties is that they are both causally non-redundant. Thus, causal non-redundancy is the criterion of objecthood; NAO is true.

First, consider a non-gunky world with emergent properties, W_2. Either a plurality can instantiate an emergent property or not. If a plurality can instantiate an emergent property, then if you're motivated to accept nihilism at W_1, you should also accept nihilism at W_2. If pluralities can instantiate emergent properties, then the best theory at emergent property worlds is nihilism as it's more parsimonious than a theory that posits a composite when a plurality instantiates an emergent property. In which case, worlds like W_2 are relevantly similar to worlds like W_1. The only objects mentioned by the best theory of W_2 will be n-independent objects. As argued in 2, n-independent objects are simples. So, if pluralities can instantiate emergent properties, only n-independent objects exist at W_2 and NAS is true at W_2.

If an emergent property must be instantiated by a single object, not a plurality of objects, and by definition a simple cannot instantiate an emergent property, then an emergent property must be instantiated by a composite object. When two or more objects together instantiate an emergent property, the aforementioned objects must compose a third unified single object. If this is correct and you are motivated to nihilism at W_1, then the following two claims are also true. First, the best theory at emergent property worlds should posit a conceivable object O iff O is n-independent OR O's conceivable proper parts instantiate an emergent property. Second, at emergent property worlds, object O is a simple iff O is n-independent.

The argument for the first claim is similar to the argument in 2 that our best theory should posit the real existence of a conceivable object O, iff O is an n-independent object. The only

relevant difference between W_1 and W_2 is that at W_2 our best theory should also posit composite objects to instantiate emergent properties. Objects that don't instantiate emergent properties are relevantly similar to the objects at W_1. Cases like the Brangelina case that take place at W_2 (Brangelina* cases) support 1* below just as the Brangelina cases supports premise 1 in 2 (O^1 is a conceivable object without emergent properties).

(1*) If O^1 is not n-independent, then our best theory shouldn't posit the real existence of O^1.

Similarly, cases like the Speidi and Bennifer cases that take place at W^2 (Speidi* and Bennifer* cases) support 2* below just as the Speidi and Bennifer cases support premise 2 in 2 (O^2 is a conceivable object without emergent properties).

(2*) If O^2 is n-independent, then our best theory should posit the real existence of O^2.

(Supported by the Speidi* and Bennifer* cases.)

It follows from 1* and 2* that our best theory should posit the real existence of a conceivable object without emergent properties, O, iff O is n-independent. So, the best theory at emergent property worlds should posit a conceivable object O iff O is n-independent OR O's conceivable proper parts instantiate an emergent property.

I'll now turn to the second claim: at emergent property worlds, object O is a simple iff O is n-independent. Objects at emergent property worlds either instantiate emergent properties or don't. Objects with emergent properties are composite objects, as assumed above. Objects without emergent properties, the n-independent objects, are either simples or composites. As I argued in 2, if these objects without emergent properties were composites, their conceivable proper parts would *really* exist. So, these objects without emergent properties must be simples since their conceivable proper parts don't *really* exist. Thus, at emergent property worlds, if pluralities cannot instantiate emergent properties, NAS is true. In sum, at emergent property worlds whether

or not pluralities can instantiate emergent properties, all and only n-independent objects are simples. I have now argued that NAS is true at all worlds with simples.

In 2, I argued at W_1 we should posit a conceivable object O iff O is an n-independent object. In 3, I argued at W_2 we should posit a conceivable object O iff O is an n-independent object or O's conceivable proper parts instantiate an emergent property. So, at non-gunky worlds with or without emergent properties we should posit a conceivable object O iff O is an n-independent object or O's conceivable proper parts instantiate an emergent property. This is a disjunctive criterion for objecthood. Assuming it would be better to have a unified account of objecthood, let's find out what unifies n-independent objects and objects whose conceivable proper parts instantiate an emergent property as objects.

The methodological criterion that led us to posit these specific kinds of objects is parsimony. We were specifically looking to posit the minimal number of objects needed to do causal work. As long as we posit enough objects to do the causal work, non-causal work can be done by employing minimal truthmaking. So, it should come as no surprise that n-independent objects and objects whose conceivable proper parts instantiate an emergent property are unified by their respective causal non-redundancy. In 2, I argued only n-independent objects exist because they can account for all of the external events at W_1 in the most causally parsimonious (CP) manner. In 3, I argued that only n-independent objects and objects with emergent properties exist because they can account for all of the external events at W_2 in the most CP manner. CP, a methodological criterion, points to the unique property that picks out objecthood: causal non-redundancy. Recall NAO states, a *conceivable object* O is an ***object*** at some possible world W iff O is *causally non-redundant* at W or worlds nomologically accessible to W. So, NAO is a unified account of objecthood that captures the fact that at all non-gunky worlds only n-

independent objects and objects with emergent properties exist. So, we should accept NAO at non-gunky worlds.

3.4 Gunky Worlds

Given that we now have good reason to accept NAO, let's consider the possibility of gunky worlds in light of NAO. First, I'll show how NAO allows for the possibility of gunky worlds at which every object instantiates at least one emergent property.[69] Next, I'll show how NAO leaves us with a puzzle regarding the possibility of gunky worlds at which there is at least one object that doesn't instantiate any emergent properties.

Consider a gunky world at which every object instantiates at least one emergent property, W_3. At W_3 every object is composed of two or more proper parts. So, every object at W_3 is a composite object and proper parts *really* exist and are also composite objects. At W_3 every object is a composite with an emergent property and every composite has proper parts that each instantiate their own emergent property and each have their own proper parts that each instantiate their own emergent property and so on and so forth. The composite must have some causal power that the combined causal powers of its proper parts don't have in order to instantiate an emergent property. NAO dictates that we shouldn't posit causally redundant objects. But, we must posit as many objects as need be to do the causal work. The reason W_3 is a gunky world, according to NAO, is because there is an infinite layer of causal powers. The only reason we posit proper parts and composites *ad infinitum* is to account for the causal powers of emergent properties at each level. The most parsimonious account, applying either QQP or CP, must posit every single composite object because each composite object is causally non-redundant. If an

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[69] There is no need to discuss the possibility that pluralities can also instantiate emergent properties because the assumption is that at gunky worlds there are composites to instantiate emergent properties whether or not pluralities can also instantiate emergent properties.

account of W_3 left out any single composite object it would be empirically inadequate as it would not be able to account for the causal facts at W_3. NAO thus gives us a parsimonious account of W_3.

Let's now turn to the more difficult case: gunky worlds at which there is at least one object that doesn't instantiate any emergent properties. Consider one such gunky world, W_4, at which there aren't any objects that instantiate an emergent property. At W_4 every object is composed of one or more proper parts. Every object at W_4 has the same causal powers as the combined causal powers of its proper parts. The puzzle posed by W_4 is as follows:

1. W_4 is possible.

2. At W_4 there is at least one **object** that doesn't have an emergent property and is thus rendered causally redundant (none of the objects at W_4 instantiate an emergent property and thus they are all rendered causally redundant).

3. NAO: a conceivable object O is an **object** at some possible world W iff O is causally non-redundant at W or at a world nomologically accessible to W.

1-3 cannot all be true. *Prima facie* it seems like we should accept the possibility of W_4. 2 seems to follow from the definition of a gunky world without emergent properties. If NAO is true, then either 1 or 2 are false. If both 1 and 2 are true, then NAO cannot be true.

The proponent of NAO has two options in light of this puzzle. A. She can reject 1, the possibility of gunky worlds at which there aren't any objects that instantiate an emergent property. She should then explain why these worlds *seem* possible but aren't. For instance, she can argue, W_4 is only gunky in terms of conceivable objects and conceivable proper parts. W_4 may be described as gunky because every conceivable object has one or more conceivable proper parts. But, there aren't *really* any gunky objects at W_4. W_4 *seems* possible because it seems that

every extended object, with or without emergent properties, can actually be divided an infinite number of times. However, the conceivability of the infinite divisibility of objects without emergent properties doesn't entail the possibility of infinite divisibility of objects without emergent properties. B. She can alter NAO to allow that at gunky worlds without emergent properties objects are causally redundant. She should then explain why this alteration isn't *ad hoc*.

I'm inclined to go with A. I don't see what reason we would have to think that an object is gunky if that object doesn't instantiate emergent properties at every level of proper parthood *ad infinitum*. On the view I have described, every possible world is gunky in the sense that every conceivable object has one or more conceivable proper parts. As explained, it is the conceivability of infinite divisibility that makes is seem as though gunky worlds without emergent properties are possible. This intuition is satisfied by my view because at every possible world every conceivable extended object has infinitely many conceivable proper parts. The intuition that there are *really* objects that are *really* infinitely divisible seems less strong to me.

When determining whether or not some conceivable object is a real object we must first determine what work, if any, the addition of the conceivable object does. If the conceivable object doesn't do any causal work or any explanatory work that cannot be done by objects already in our ontology, then there is no reason to posit that conceivable object as a real object. If W_4 were possible, it is not clear that there is any object at W_4 that does any causal work or any explanatory work. This is because there is no object that we can point to that has causal powers. I have a difficult time conceiving of causal powers and causation at a world like W_4.

I've argued that given the aforementioned methodology and the possibility of extended objects, NAS is the best account of simples. I have also argued that barring the possibility of

gunky worlds without emergent properties, NAO is the best account of objects. I then posed a puzzle for the proponent of NAO regarding the possibility of gunky worlds without emergent properties. I offered three responses the proponent of NAO might give in light of this puzzle. While A is my inclination, I'm not yet prepared to decisively argue that W_4 is impossible. There is more work to be done in determining how causation works at gunky worlds without emergent properties. Until then, worlds like W_4 pose an interesting puzzle.[70]

Chapter 4

The Minimal Truthmakers' Solution to the Exclusion Problem

We consider it common knowledge that mental properties such as wanting a sip of water cause physical events such as lifting a glass of water. Many philosophers have undertaken the project to explain how this alleged piece of knowledge can be correct. They attempt to explain what mental properties are and how they can interact in a causal way with physical properties while not conflicting with science. There are multiple versions of the mental causation problem. In this paper, I'll address the exclusion problem. The gist of the problem is that if we accept some very plausible theses, we must reject that mental properties are genuinely causal! I will offer a solution to the exclusion problem that allows that much of our mental property talk is true[71], but that there aren't *really* any mental properties. The only things that *really* exist are the minimal truthmakers. The minimal truthmakers are the objects and properties that minimally must exist in order for all the true sentences that need truthmakers to come out true. The explanatory power of mental property talk does not ontologically commit us to mental properties.[72] There are events that can be truly described as mental events. In addition, there are events that may be truly said to be 'causal' because they are composed of certain properties and those properties may be truly called 'mental properties'. In

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[71] I will explain what it takes for an ordinary sentence to be true towards the end of this section. However, if you don't think that I am correct about what it takes for an ordinary sentence to be true, you can replace the term 'true' with 'correctly assertable' or 'truth-apt'. It will not matter for the purposes of this paper whether or not our claims about mental causation are true or merely correctly assertable.

[72] See Quine (1948) for a discussion of why the use of predicates does not by itself entail the existence of a corresponding property. See my paper 'Baby Talk is Cheap, But Ontology is Not' for my discussion of why we can't read the correct ontology off of the ostensive commitments of ordinary language.

addition, these causal events may be truly said to be 'mental' in virtue of being composed of so-called 'mental properties'.

In this paper I will only argue that we need not posit mental properties in order to account for what we call mental causation. There might be reasons to posit mental properties in order to account for raw-feels (qualia), consciousness, or mental content. These phenomena pose problems that are distinct from the problem of mental causation, so solving one does not entail that you have solved another. We might need to resort to property dualism eventually if it best accounts for other phenomena, but if we do, we should not do so in order to account for mental causation.

Below is Robert Van Gulick's (1993) version of Jagewon Kim's (1998) Exclusion Argument:

1. *Token Physicalism*: Every mental event-token is identical with some physical event token

2. The causal powers of a physical event-token are completely determined by its physical properties

3. *The Nonreducibility of the Mental*: Mental properties are neither identical with nor reducible to physical properties

∴ 4. A mental event-token's mental properties do not even partially determine its causal powers[73] (from 1, 2, 3) (p. 236)

The conclusion that this argument forces upon us is surprising and fantastic. It goes against what we consider common knowledge and the phenomenology of everyday life.

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[73] This formulation of the Exclusion Argument is the argument that Kim (1998) presents, but it isn't valid. In what follows I will add a premise to make the argument valid.

If 4 is true, then only physical properties are causal as only physical properties determine an event's causal powers. But, it surely seems to be the case that my mental properties cause physical events. For example, introspectively, the painfulness of my pain seems to be the cause of my flinching or screaming 'ouch'. The Exclusion Argument, if sound, proves that the painfulness of my pain does not even partially cause my reaction.[74,75] This is the exclusion problem.

In this paper I will sketch out and motivate a view that solves the problem posed by the Exclusion Argument by dissolving the apparent problem. The view I will describe has the strength of satisfying a bundle of plausible desiderata. The first four desiderata are *prima facie* plausible. If one is not motivated by one of them, one ought to have a reason why it should not be a desideratum. First, the solution allows us to remain neutral as to whether properties are universals, tropes, or whatever it is that nominalists say that properties are. Second, it allows that much of our talk that involves mental property

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[74] Note that the sense of causation under discussion in the Exclusion Argument is metaphysical causation between fine-grained event-tokens. When I use causal terminology in this paper I mean to use it in the same way it is used in the Exclusion Argument. So, the causal power that a property contributes to the causal power of an event helps to determine which events can be caused by that event-token. Now, what is metaphysical causation? I cannot answer that question in this paper, but I can say a few frustratingly vague things about it. Metaphysical causation is the kind of causation that is actually happening in the world. The relata of metaphysical causation are the kinds of things that really exist. Metaphysical causation is the only kind of causation that actually does any causal work. Every true causal statement is made true by at least one instance of metaphysical causation.

[75] 'The painfulness of my pain' may seem like a strange cause of my screaming. Instead, you might think, it is my pain that causes me to scream. If it is just the event my being in pain that causes me to scream, then one can accept a Davidsonian solution. Mental events like my being in pain are each token-identical to some physical event. So, the event my being in pain is token-identical to some neural state. The neural state causes me to scream. So, the event of my being in pain causes me to scream. But, the objection to this Davidsonian style solution is that it is something mental about the event of being in pain that causes me to scream and not just being in a certain physical state (See Ernest Sosa (1984) for a version of this objection). This is called the Qua Problem. It is not just my being in pain that causes me to scream. It my being in pain qua the painfulness of my being in pain that causes me to scream. The objector requires a mental property of the event to play a causal role and not just a physical property. So, to address the objection that there is a mental property that causes me to scream, I need to talk about a mental property of being in pain. The mental property of being in pain that seems to cause me to scream is painfulness. I will discuss the Qua Problem further in 4.3.

terms, including causal talk, is true or truth-apt. Third, the solution that I will sketch does not contradict widely accepted scientific working hypotheses. Fourth, the solution is parsimonious.

The following desideratum is less *prima facie* plausible, but I will give reasons for accepting it as a desideratum later in the paper. Fifth, the solution does not force us to accept systematic overdetermination. For the sake of brevity, I will not motivate the first four *prima facie* plausible desiderata; I will merely demonstrate that the solution of the Exclusion Argument that I sketch in this paper meets them.

The view that I sketch in this paper will embrace the conclusion that talk of mental properties is often true, but this talk is made true by events that involve microphysical particles having certain microphysical properties like having a specific spin, charge, and location in space-time.[76] For example, as I will explain later, the sentence 'the painfulness of my being in pain is causing me to scream' is made true by the arrangement of some microphysical particles and microphysical properties.

As explained in 'Baby Talk is Cheap, but Ontology is Not', one can follow Thomasson (2010) and derive the truth-conditions of a sentence from the standards of use for each of the terms that appear in the sentence. For example, the claim that 'A causes B' is true if the use of 'cause' adheres to the standards that govern the proper use of 'cause'.[77] For Thomasson the relevant standard of use for a term are the application and

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[76] Particle and fundamental property talk in this paper are shorthand for whatever our best-completed physics tells us there is. It may be that all that exists is space-time or strings in space-time or a single field. For Minimal Truthmaker Nihilists like me these fundamental particles, strings, or fields, are simples, assuming this world is not a gunky world or an emergent property world. As explained in 'Nihilism, but Not Necessarily', we have most reason to accept that the objects that will be mentioned in our best-completed physics at worlds without gunk or emergent properties are simples. For all I have said, it might turn out that the simples at this world are extended particles, strings, or fields.

[77] For a complete discussion of application, coapplication conditions, and standards of use, see Thomasson, A. (2010).

coapplication conditions for that term.[78] However, this paper may also be read as claiming that our mental-property talk is merely truth-apt or correctly assertable since there aren't *really* mental properties.[79] Nothing in this paper hangs on whether or not one would prefer to say that our mental-property talk is true or merely truth-apt. In addition, for the purposes of this paper, let's follow Thomasson's (2010) method of deriving the truth-conditions for a sentence, though there may be other methods that are consistent with the view I present in this paper.

Surprisingly, my solution embraces the conclusion of the Generalization Argument, which I will discuss in the next section.[80] If the Generalization Argument is sound, then the following conditional is true: if the Exclusion Argument is sound and thus mental properties are causally inefficacious, then macro-properties, such as neural and chemical properties, are also causally inefficacious. While some reductive physicalists (Kim, 1998) attempt to explain why the Exclusion Argument is a problem for mental properties, but not for other macro-properties, I think that the Exclusion Argument is a problem for all properties that aren't microphysical properties.[81]

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[78] Thomasson explains that the rules governing the use of a term constitute the terms meaning. She claims, "application conditions…are certain basic rules of use that are among those that are meaning-constituting for the term" (2015, p.93). Other rules that constitute the meaning of terms are "co-application conditions" and "exit-rules, which tell us what we are committed and entitled to on the basis of applying a term" (2015, footnote 4).

[79] As explained in 'Baby, Talk is Cheap, but Ontology is Not', when I use the term '*really*', like 'there aren't *really* mental properties', I mean to say that mental properties aren't minimal truthmakers and therefore aren't members of the correct ontology. Though it is true to say 'there are mental properties' in most contexts, the truthmakers for claims about mental properties will be microphysical particles and properties.

[80] See Kim (1998) and Fodor (1989) for a more detailed discussion of the Generalization Argument.

[81] As discussed in 'Nihilism, but not Necessarily', I am a certain kind of mereological nihilist. As I have not yet discussed, if properties *really* exist at all, there are only *really* sparse properties. According to a sparse property view the only properties that *really* exist are the microphysical properties. The only properties that *really* exist are the properties that are mentioned in the best theory of the world. Also, when I discuss microphysical properties, I simply mean to refer to a specific instance of microphysical properties. In addition, when I discuss microphysical particles I mean to be discussing whatever particles are at bottom. I understand that some people reject the concept of their being something at bottom and perhaps there is just gunk. For the sake of clarity, I will assume that there is some sort of particle at bottom. However, I don't

In what follows I divide the paper into three parts. In 4.1, I will explain and discuss the Exclusion Argument in greater detail. In 4.2, I will sketch and motivate my preferred solution of the Exclusion Argument. Finally, in 4.3, I will respond to a couple of objections that I anticipate. The object of this paper is to sketch a kind of solution to the Exclusion Argument and demonstrate that the solution satisfies the desiderata listed above and can meet the most pressing challenges.

4.1 The Exclusion Argument

I will now discuss the Exclusion Argument, solutions to the argument that rely on systematic overdetermination, and the Generalization Argument. My discussion of all three will motivate the type of solution to the Exclusion Argument I sketch in 4.2. My discussion of the Exclusion Argument aims to show that either we should reject premise three, the Non-Reducibility of the Mental, or we should accept the conclusion of the argument, which states that mental properties aren't causal.

I accept the first two premises of the Exclusion Argument as they are both accepted as a working hypothesis amongst contemporary scientists. Token Physicalism, premise one, merely states that each mental event-token is identical with some physical event-token. The second premise states that the causal powers of a physical event-token are completely determined by the physical properties of that physical event-token. I will refer to this premise as the causal closure of the physical. Premise two would seem to imply that mental properties aren't needed to determine any of the causal powers of any physical event-token, if mental properties aren't identical or reducible to physical properties.

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think that the existence of mental properties depends on whether or not there is gunk at bottom. In this paper I will not argue that in a gunky world there aren't *really* any mental properties.

Frequently, philosophers accept the Non-Reducibility of the Mental, the third

premise, as a result of multiple-realizability arguments.[82] Multiple realizability arguments

generally argue that mental properties cannot be identified or reduced to physical

properties since mental properties can be realized in so many different physical ways.

Since many creatures may be in pain and it is possible that their pains have nothing

physically in common, the property of pain cannot be reduced to or identified with

physical properties. This is a very rough and incomplete discussion of arguments for the

Nonreducibility of the Mental, but hopefully, it suffices for this paper.[83]

Nonreductive physicalists accept all three premises. The Exclusion Argument tries to

force the non-reductive physicalist into admitting that mental-properties do not even

partially determine the causal powers of mental-event tokens. Non-reductive physicalists

would like to accept premises one through three and avoid the conclusion.[84] Van Gulick

(1993) and Steinvör Thöll Árnadóttir and Tim Crane (2013) argue that the conclusion

does not deductively follow from the first three premises since the causal powers of

mental event-tokens may be overdetermined in a non-competing way. Their reasoning is

as follows. Since every mental event-token is identical to some physical event-token and

the causal powers of every physical event-token are completely determined by its

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[82] See Lewis (1983), Van Gulick (1993), Burge (1993), Baker (1993) for some discussion of multiple realizability arguments. Note that there are many reasons that philosophers accept the Non-Reducibility of the Mental. For example, the normative character of the mental is arguably another reason to accept the Non-Reducibility of the Mental. See Davidson (1970) for more discussion of the normative character of the mental.

[83] Multiple realizability arguments rely on the premise that mental properties are the type of thing that can be realized by many things. The view that I sketch in this paper only accepts a *token* identity between mental events and physical events. I reject type identity between mental and physical properties as I reject that there are *really entities* in the world that are mental properties. On my view, there aren't *really* any mental properties to be multiply realized. This will become clear later in the paper.

[84] See Van Gulick (1993), Burge (1993), Fodor (1975), Davidson (1970) for some examples of Non-Reductive physicalists.

physical properties, then the causal powers of every mental event-token are completely determined by its physical properties. In which case mental properties either don't determine a mental event-token's causal powers at all or they *overdetermine* the mental event-token's causal powers. Since, accepting premises one through three allows for the overdetermination of an event's causal powers, the conclusion does not follow.

Assuming we don't want to be scientifically revisionary and we want to reject the conclusion that mental properties aren't causal, we are left with the following choice. We may either accept that mental event-tokens' causal powers are systematically overdetermined and then argue that this kind of overdetermination is unproblematic or reject the Nonreducibility of the Mental. Let's first accept the Nonreducibility of the Mental to try to understand what kind of overdetermination is at issue in cases of mental causation, when overdetermination is problematic, and how systematic overdetermination may be unproblematic.

4.1.1 Overdetermination

Consider a pain event-token. According to the non-reductive physicalist that thinks that mental properties overdetermine the causal powers of a mental event-token, the property of being in pain is causal. The property of being in pain is realized by certain physical event-tokens, which are causal, and are identical to mental event-tokens. The causal powers of the mental event-token are sufficiently determined by the physical properties of the mental event-token, but they are also determined by the mental properties of the mental event-token. The mental properties are realized by physical properties, so when the physical properties determine the causal powers of the mental event-token, the mental properties also determine the causal powers of the mental event-

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token through their realization base, the physical properties. The mental event-token is a physical event-token with its microphysical constituents occupying certain spatio-temporal coordinates. The mental property of this mental event-token is realized by *this* configuration of microphysical constituents. The mental property may also be realized by other physical realizations, but in *this* event-token the mental property determines the event's causal powers, since its physical realization determines the event's causal powers.

The problem with overdetermination in this sense is that it is more parsimonious, given all of our evidence of mental causation, to just claim that that the physical properties completely determine the causal powers of the mental event-token and that the mental properties don't play any causal role.[85,86] The best account of mental causation, given the goal of giving an accurate metaphysics, is the most parsimonious account of mental causation, *ceteris paribus,* that can account for all of the evidence of mental causation.[87] We don't need an ontology that includes mental properties to account for the evidence that we have of mental causation, if we can account for all evidence of mental causation without mental properties. Since we can account for the causal powers of mental event-tokens, which are physical event-tokens, without an ontology that includes mental properties, we ought not include mental properties in our ontology to account for mental causation. Thus, given the evidence we have about the causal powers of mental event-tokens, which includes that they can be fully accounted for without mental

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[85] I will address this point about parsimony more fully in 4.3 objection 2.

[86] Note that it follows from my view that determinables such as 'being red' aren't causal. Only determinates are causal. So, if 'being shade of red 12' was a determinate (which I don't think it is), then being shade of red 12 would be a causal property. As my view stands, determinates will be specific microphysical properties such as 'being negatively one charged'.

[87] For a longer discussion of the theoretical virtues and the largely accepted method of metaphysics that I am assuming, see 'Nihilism, but not Necessarily'. As explained there, the best theory is the theory we have most reason to accept given internal consistency, external consistency, and the theoretical virtues.

properties given the causal closure of the physical, we have most reason to think that

mental properties aren't causal.[88] We don't have reason to think that the causal powers of

mental event-tokens are overdetermined by their mental properties. So, lets add premise

3a to the Exclusion Argument:

    3a. The causal powers of physical event tokens aren't overdetermined.

I will return to why I think my argument from parsimony supports our acceptance of 3a

in 3.

4.1.2   The Generalization Argument

Before I move on to my solution to the Exclusion Argument, I am going to take a

brief detour into what is referred to as the Generalization Argument by Jagewon Kim

(2000) in order to clarify my philosophical commitments to the reader. One might think

that my solution to the Exclusion Argument forces me to accept the conclusion of the

Generalization Argument and that that is a cost of my view. In this section I will explain

to the reader why accepting the conclusion of the Generalization argument is not a cost.

The Generalization Argument is as follows. If it is the case that the causal powers of

mental properties overdetermine the causal powers of their microphysical property bases,

then it is the case that all the causal powers of properties posited by the higher order

sciences overdetermine the causal powers of their microphysical bases. In which case, if

the Exclusion Argument works for mental properties, then it also works for psychological

properties, neuroscientific properties, biological properties, and chemical properties. So,

given my commitment to 3a, I ought to conclude that the fate of the causality of higher-

order scientific properties shares the fate of the causality of mental properties.

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[88] For a similar argument as to what the problem with overdetermination is see Sider, 2003.

I'm committed to the thesis that the properties of the higher order sciences do not *really* exist. The correct ontology only includes minimal truthmakers. As the causal powers of properties of the higher order sciences overdetermine the causal powers of their microphysical property bases and thus aren't minimal truthmakers, the properties of the higher order sciences aren't members of the correct ontology. The minimal truthmakers for sentences stated in the language of the higher order sciences are microphysical objects and properties. I accept the conclusion that the fate of higher-order scientific property causality is linked to mental property causality. I accept the conclusion of the Generalization Argument. I'm committed to a worldview that only allows for the *real* existence of properties and objects if there is evidence that those properties and objects *really* exist. This means that if all of the evidence can be accounted for with only the properties and objects posited by microphysics, then the objects and properties posited by higher-order sciences aren't causal and don't *really* exist.[89] We have no compelling reason to think that talk that uses the predicates of chemistry is made true by chemical properties and not merely a bunch of microphysical properties. We have no reason to think that the predicate 'being hydrogen' corresponds to a single property. Rather, talk of something's 'being hydrogen' is made true by some microphysical particles and properties being arranged a certain way in space-time as well as the application and coapplication conditions for the predicate 'being hydrogen'. Namely, the

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[89] I am committed to Minimal Truthmaker Nihilism, which includes the thesis that composition never *really* takes place at this world. The ontology of this world that accompanies Minimal Truthmaker Nihilism will only include those things that are fundamental objects. These objects won't have parts. I am committed to Minimal Truthmaker Nihilism because just as the causal powers of mental properties overdetermine the causal powers of their physical properties, so too the causal powers of composite objects overdetermine the causal powers of the microphysical objects that supposedly compose the composite object. To see a full version of the overdetermination argument for mereological nihilism, see Trenton Merricks *Objects and Persons* (2001, p.56-84). For my full argument for Minimal Truthmaker Nihilism, see 'Nihilism, but not Necessarily'.

predicate 'being hydrogen' may be used to describe certain arrangements of microphysical particles and properties. As the conclusion that the fate of the predicates of the special sciences stand or fall with the fate of the predicates of talk of the mental is a rather large thesis to argue for in one paper, I will limit myself to a discussion of mental properties. Note that for all that I say in this paper, one could accept everything that I say about the mental properties and still reject the conclusion of the Generalization Argument. While the above explanation of what I think of the properties of the special sciences was brief and incomplete at best, the fate of the properties of higher-order sciences will become clearer with my discussion of mental properties in the next section.

4.2 Mental Properties and a Solution

We have a valid argument and we have accepted premises 1 and 2 and I have argued that we should also accept premise 3a. So, we can either reject premise 3, the Non-Reducibility of the Mental, or claim that mental properties aren't causal. Let's first consider rejecting premise 3 since we seem to have a strong intuition that mental properties are causal. Premise 3 states that mental properties are neither identical with nor reducible to physical properties.

In what follows I will argue that while in some contexts premise 3 is true, in the context relevant to the Exclusion Argument, premise 3 is false. First, I will explain what I take the minimal truthmakers to be. Then, drawing on 'Baby, Talk is Cheap, but Ontology is Not', I will discuss two ways to make sense of the fact that while ordinarily premise 3 may be true, when we are doing metaphysics, premise 3 is false.

4.2.1   The Truthmakers

My ontology is as follows. Microphysical particles and their properties exist as well as space-time.[90] Talk of events is made true by the location of these particles and properties in space-time. Microphysical particles and their properties as well as their locations serve as the minimal truthmakers for all true sentences that require truthmakers in all contexts.[91] The only things that exist according to my ontology are the things that are the minimal truthmakers for all true sentences that require truthmakers.

4.2.2   Contexts or Quantifiers: Truth Inside and Outside the Ontology Room

As discussed in 'Baby, Talk is Cheap, but Ontology is Not', there are ways of talking that get at the things that are included in the correct ontology and ways of talking that don't. Ross Cameron (2010) posits an ontological existential quantifier in addition to the English existential quantifier. So, when using the English existential quantifier 'there are mental properties' is true. When using the ontological existential quantifier signified by *'really'*, 'there *really* are mental properties' is not true. The ontological quantifier only quantifies over the objects that are in the correct ontology. The things in the correct ontology are the minimal truthmakers. Instead of positing a quantifier, Terrance Horgan and Matjaž Potrč (2008) claim that in some contexts 'there are mental properties' is true, but in other contexts 'there are mental properties' isn't true. Ordinary contexts generally don't require a one-to-one correspondence between a term or adjective and an object or property respectively. Ordinary contexts only require indirect correspondence (IC)

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[90]As previously stated, particle and property talk are shorthand for whatever our best-completed physics tells us there *really* is. It may be that all that exists is space-time or strings in space-time or a single field. In addition, by 'fundamental object or property' and 'microphysical object or property', I mean the objects and properties that the best-completed physics includes. For the mereological nihilist, these things will be simples.

[91] There are some people who think that not all truths have truthmakers. For instance, negative existentials would not seem to have any truthmakers. For me, these sentences that don't have truthmakers don't carry ontological commitments. Accepting these sentences as true does not commit one to anything's existence.

between language/thought and the world. Contexts in which one is discussing ontology or metaphysics require a one-to-one correspondence, a direct correspondence (DC) between language/thought and the world. Since talk of mental properties doesn't correspond in a one-to-one manner to properties in the world, atomic sentences that mention mental properties are false in DC contexts. Talk of the mental properties does correspond in a one-to-many manner to properties and objects in the world, so talk of mental properties can be true in IC contexts. To remain neutral between the Cameron style view and the Horgan and Potrč style view, I will use the inside and outside the ontology room metaphor to distinguish sentences that get at the correct ontology and sentences that don't get at the correct ontology. When I use 'inside the ontology room', I'm referring to sentences that use the ontological existential quantifier or sentences that are uttered in DC contexts. When I use 'outside the ontology room', I'm referring to sentences that use the English existential quantifier or sentences that are uttered in IC contexts. An intuitive way of explaining the inside and outside ontology room distinction is that the language used inside of the ontology room is a language that gets at what there *really* is. Language can describe what there *really* is in more or less perspicuous ways. While there are more or less perspicuous ways of speaking, this view is not committed to more than one-way of being.

Inside the ontology room, all terms correspond in a one-to-one manner to an object or property. For example, the term 'having .5 spin' may correspond to a single property. Therefore, the term 'having .5 spin' is a term that may be included in true sentences in the ontology room. 'Water' cannot be included in true sentences inside the ontology room

since it does not correspond in a one-to-one manner to an object or property. The term 'water' may be used in true sentences outside of the ontology room.

It's not the case that in English all terms and predicates correspond directly to a single object or property. Most terms and predicates may be truly applied in certain situations, but the terms need not correspond in a one-to-one manner in order to truly apply. Events will correspond to collections of microphysical particles located in space-time, so there will not be a one-to-one correspondence from a term used to talk about an event to a single object or a single property. The predicate 'being in pain' does not correspond to a single property. The term 'brain' does not correspond to a single object. Terms will only have a one-to-one correspondence when they are applied to minimal truthmakers. Predicates will only have a one-to-one correspondence when they are applied to whatever properties are minimal truthmakers. If a term or a predicate does not have a one-to-one correspondence to a minimal truthmaker, then the term or predicate cannot be included in a true atomic sentence in the ontology room. If the term or predicate does not correspond in a one-to-one manner to one of the minimal truthmakers, then the term or predicate does not correspond directly to a single object or property that is a part of the correct ontology.

Sometimes terms or predicates may truly apply to a unified group of particles in a non-disjunctive manner. For example, it might be the case that there is strict similarity between all water molecules such that their microphysical constituents all have exactly similar microphysical properties. Still, it is not the case that the 'water molecule' corresponds to a single object, since the causal powers of all water molecules are overdetermined by the causal powers of the microphysical particles that make them up.

Other terms or predicates may apply in less deterministic ways than the term 'water molecule'. Some of the application and coapplication conditions for terms and predicates are indeterminate and they change based on our social practices. There might be little agreement among agents as to which cases the predicate or term may be truly applied to because the application and coapplication conditions for the predicate or term are indeterminate. For example, the term 'love' may have truly applied to different cases 400 years ago than it does today. There might be paradigm cases that all agents across time will agree the term 'love' will truly apply to, but there will also be cases where agents are unsure and other cases that agents disagree about. The cases that the term 'love' truly applies to might have very little in common. It might be that the term is truly applied in cases that don't have any similar properties since for the term to truly apply it must only have one of many possible observable characteristics. The term may truly apply in two cases, but the two cases aren't at all similar.

I don't take my project to be dependent on there being an inside-the-ontology-room language as I am merely using the inside/outside the ontology room metaphor as a tool. Rather, my view is that while many sentences may be true, I am only ontologically committed to the minimal truthmakers for all the true sentences that require truthmakers. There is no need not distinguish between truths of fundamental physics and truths of biology. They may all simply be true on my view. However, fundamental physics attempts to use language that directly corresponds to single properties and objects that do not lend themselves to being subdivided into more specific arrangements of properties and objects; a term corresponds to one object and a predicate corresponds to one property. I am committed to there being ways of speaking that describe what there *really*

is in more or less perspicuous ways. The language of fundamental physics will at least be in the business of trying to describe what I take to be the minimal truthmakers, which means the language of fundamental physics will be the best language to date to use to get at my ontological commitments. So, when I say 'pain doesn't *really* exist' or something similar, I mean that the term 'pain' does not correspond in a one-to-one manner to a property that acts as a minimal truthmaker.

4.2.3   Truth Outside the Ontology Room – Terms and Rules of Use

Consider the following sentence: 'Some cardinals are red'. This sentence is true because there is at least one cardinal that is red. The application and coapplication conditions for the term 'cardinal' are such that when we apply them, there is at least one correct applications that is also a correct applications of the term 'red'. An application condition for the term 'cardinal' may be something like the following: The term 'cardinal' may be truly applied if it is applied to a bird that is rather small and has a bill and a crest and feathers.[92] The term 'red' may be truly applied if it is applied to something that is in white light and absorbs all light wavelengths besides wavelengths between 620-740 nm (or somewhere near that wavelength) and the light that is scattered is the light with wavelengths between 620-740 nm. The world is such that there is at least one event where the term 'cardinal' and the term 'red' may be appropriately applied to an overlapping bit of space-time. So, the sentence 'some cardinals are red' is true.

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[92] As discussed in 'Baby, Talk is Cheap, but Ontology is Not', Thomasson explains the rules of use for terms with her discussion of application and coapplication conditions in her book Ordinary Objects (2010, p. 39-41). Note, that I am not accepting her complete theory in this paper; I am merely using her idea that terms have application and coapplication conditions and so terms may be truly applied if the world is a certain way.

The truth-conditions for a sentence need not commit us to any particular account of what the truthmakers are. In fact, the truth-conditions are more likely to be the kinds of conditions that could be fulfilled by a lot of different microphysical particles and properties in different arrangements. There are many different arrangements of microphysical particles and properties in space-time that serve as the truthmakers for the sentence 'some cardinals are red'. In addition, particles, or waves, or fields may fulfill the truth-conditions for the sentence 'some cardinals are red'. We need not know the complete physical story of the world in order to specify truth-conditions for sentences. The truth-conditions for our sentences may be neutral amongst some theories of physics and metaphysics. In short, there must be minimal truthmakers to fulfill the truth-conditions of true sentences that need truthmakers, but our knowledge of the truth-conditions of certain sentences may leave us somewhat ignorant as to what exactly the minimal truthmakers actually are.

To find out if a sentence is true, first we investigate the application and coapplication conditions for the terms that occur in the sentence in order to determine the truth-conditions of the sentence. Once we have determined the truth-conditions of the sentence we look at the world to determine whether or not the truth-conditions are fulfilled. If the truth-conditions are fulfilled, the sentence is true. Now, in practice, determining whether or not the truth conditions are fulfilled may not require that we know very much about microphysical particles. However, it is still the case that the microphysical particles and their arrangements are the things that are fulfilling the truth-conditions. It may just be that the truth-conditions only require some easily observable conditions to be fulfilled and we can tell whether or not those conditions are fulfilled without determining exactly what the

world is like such that those conditions are fulfilled. For example, the application and coapplication conditions for the term 'cardinal' don't require that we know very much about the science of cardinals or particle physics in order to use and refuse the application of the term in certain circumstances. The truthmakers for our claims are ultimately microphysical particles and properties in certain arrangements in space-time, but we only need to determine that there are some observable features such that we can conclude that there is a certain kind of bird, regardless of what physics makes it the case that there actually is that certain kind of bird. There are a lot of patterns that particles in space-time may instantiate in order for it to be the case that we can observe certain features that allow us to appropriately apply the term 'cardinal'.

4.2.4   Mental Terms Outside the Ontology Room

It should be clear from my discussion that 'pain' cannot be truly applied inside the ontology room since it does not directly correspond to a minimal truthmaker. So, a property that corresponds to the term 'pain' is not a member of the correct ontology. However, 'pain' can occur in true sentences outside of the ontology room. Outside of the ontology room 'pain' will have certain application and coapplication conditions in a specific context. Once we determine these application and coapplication conditions, we can determine the truth-conditions of the sentences 'pain' occurs in, finally we can investigate the world to determine whether or not the truth-conditions are fulfilled. If the truth-conditions of a sentence 'pain' occurs in are fulfilled, then the sentence is true outside of the ontology room.

The application and coapplication conditions for 'pain' might be something like the following: Use the term 'pain' when a person has a specific brain state that is detectable

via an MRI, or when one observes the effects of an injury on a non-anesthetized person that usually results in a person screaming, writhing, and crying, or when a person introspectively observes a certain phenomenal feel. For example, a rule of use may be, if you have this certain phenomenal feel, then call this phenomenal feel pain.[93] It may be that the ultimate truthmakers for it being the case that you have a certain phenomenal feel is that there are some physical goings on in your brain, but you need not know the physics of pain to know that the term 'pain' applies when you have a certain phenomenal feel.[94] This is not an exhaustive list of the application and coapplication conditions for the term. Also, it is likely the case that the application and coapplication conditions for 'pain' are indeterminate and change somewhat with context. In addition, it may be that in one case where the term 'pain' applies only one of the application conditions for 'pain' makes it the case that that use of 'pain' is correct, while in other cases it might be that there are multiple application conditions for 'pain' that make that use of 'pain' correct. It need not be the case that the application and coapplication conditions for 'pain' are completely consistent. The application and coapplication conditions for 'pain' within a context of utterance for a speaker need to be consistent. But, as language is complex and may have developed differently in different populations, application and coapplication conditions may sometimes contradict each other from one context of utterance to another.[95]

To further clarify my view, let's consider the following sentence:

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[93] Note, pain is not just a neural state in every context outside the ontology room. The context will partly determine the application and coapplication conditions for 'pain'.

[94] A type-A physicalist might say that once we fully understand the brain, there will be some physical goings on in the brain that analytically entail that the subject of the brain is in pain and introspectively observes a certain phenomenal feel. However, to use the term 'pain' correctly when talking about phenomenal feels, the subject need not know this analytic entailment is or anything about the brain.

[95] I'm not committed to true contradictions. There might be sentences with the term 'pain' that are both true and contradict one another, but this will be a result of different standards of use for the term 'pain' being employed in different contexts of utterance.

The painfulness of my pain is causing me to scream.

The truth-conditions for this sentence may be something like the following: I feel a certain phenomenal feel such that the term painfulness is correctly self-applied. Whatever minimal truthmakers are for 'I have that phenomenal feel' cause me to scream. It happens to be the case that it is some physical particles in my brain that makes it the case that I have a certain phenomenal feel such that the term painfulness is correctly self-applied. The physical particles in my brain cause some other microphysical processes in my body, which in turn cause me to scream. So, it is the case that whatever truthmakers fulfill the truth conditions of my being in pain are the same truthmakers that are causally related to the truthmakers for the claim 'I am screaming'. The truthmakers for my having a certain phenomenal feel happen to be some microphysical particles arranged in a certain way and they are causally related to some particles in my vocal chords and mouth arranged in a certain way, which are the truthmakers for the claim that I am screaming.

Again, note that the application and coapplication conditions for 'pain' and 'painfulness' might be disjunctive. It might be that the term applies to most cases where a person screams and flinches and yells "oww", but the term might also apply in cases where brain particles are observed to be arranged in a certain way on a brain scan but the person is paralyzed from the neck down and mute. The truth-conditions for the sentence 'the painfulness of my pain causes me to scream' are fulfilled in such a way that whatever fulfills the truth-conditions for 'I'm in pain' causes some particles to be arranged in a way such that the truth-conditions 'I'm screaming' are fulfilled.

4.2.5   Premise 3 Inside and Outside of the Ontology Room

In order to assess premise 3 inside of the ontology room let's first get rid of the negation and disjunction. The question becomes, is it true that mental properties are reducible to physical properties and is it true that mental properties are identical to physical properties. In the ontology room the answer to both of these questions as stated is no, since the term 'mental property' cannot be included in true atomic sentences in the ontology room as mental property talk does not directly correspond to a single minimal truthmaker. So, premise 3, as stated, is true inside of the ontology room.

However, there is another relevant question one can ask. Instead of asking a question that incudes mental property talk, we can ask a similar question that only includes terms that refer in a one-to-one manner to the minimal truthmakers for the application of mental terms and predicates. As explained above, to refer in a one-to-one manner is for every term or predicate mentioned to refer to a single object or property. The original question was 'are mental properties identical or reducible to physical properties?' The relevantly similar question now is as follows: is the disjunction of all of the microphysical patterns in space-time that serve as the minimal truthmakers for true sentences that include mental terms identical to the same disjunction of all of the microphysical patterns in space-time that serve as the minimal truthmakers for true sentences that include mental terms? but as we will see, the answer to that relevant question is trivially true.

There are physical objects and properties that are the truthmakers for true sentences that include mental terms. These physical objects and properties are the metaphysical underpinnings for the true application of mental terms and predicates. It will turn out that the truthmakers for all of the true sentences that include mental terms are identical to a bunch of microphysical objects and properties arranged in space-time. It is trivially true

that some arrangements of microphysical objects and properties in space-time are identical to themselves. So, premise 3 when transformed into a sentence that only uses language that refers in a one-to-one manner to minimal truthmakers will say that it is not the case that some microphysical particles in space-time are identical to themselves. Thus transformed, premise 3 is trivially false. So, inside the ontology room, the Exclusion Argument will not be sound.

Is premise 3 false outside of the ontology room? More concretely, is 'painfulness is identical to or reducible to physical properties' true outside the ontology room? Note that if the answer to the latter question is no, then the answer to the former question is no. If answer to the latter question is yes, then I will take it to be the case that we can use the same method used to answer the latter question to answer the former question and the answer to the former question will also turn out to be yes.

Outside the ontology room there are three relevant interpretations of 'painfulness is identical to or reducible to physical properties'. The first two interpret the question as asking a metaphysical question instead of an epistemic question. One metaphysical interpretation asks if there is a one-to-many correspondence between a mental term and multiple arrangements of physical truthmakers. This is the same question that I discussed above as the relevant question inside the ontology room. The second metaphysical interpretation asks if there is a one-to-one correspondence between a mental term a single arrangement of physical truthmakers. The third interpretation is an epistemic interpretation. On this interpretation the relevant question is do we know and can we know which physical truthmakers make true sentences that mention mental terms. I will discuss each of these interpretations in turn.

1. Is it the case that every time the term 'painfulness' is used in a true sentence that there is some arrangement of microphysical objects and properties that act as the truthmakers for those sentences? Yes. The term 'painfulness' will truly apply in virtue of objects and properties in a certain arrangement. There will be some disjunctive set of application and coapplication conditions for the term 'painfulness'. These application and coapplication conditions will determine the truth-conditions for sentences that mention 'painfulness'. There will be some set of arrangements of minimal truthmakers that can fulfill these truth-conditions. But as I explained at the beginning of the section, this just means that for every true sentence that mentions 'painfulness' there will be a related sentence that is true inside the ontology room that only mentions minimal truthmakers. This related sentence only refers in a one-to-one manner to objects and properties that are the minimal truthmakers for the sentence with 'painfulness'. As discussed above, on this interpretation premise 3 is false and Exclusion Argument isn't sound. Mental properties are identical or reducible to physical properties and objects as physical properties and objects are the minimal truthmakers for all true sentences that mention mental property terms.

2. Is it the case that every time the term 'painfulness' truly applies it is in virtue of a *single* arrangement of physical objects and properties? Or a *single* physical property? No. There is not a one-to-one correspondence between the term 'painfulness' and a single arrangement of minimal truthmakers. There are different arrangements of physical properties and objects that act as the truthmakers for different true sentences with the term 'painfulness'. On this interpretation, premise 3 reads as follows: A mental property term is neither identical to nor reducible to a *single* arrangement of physical objects and

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properties. So, premise 3 is true. However, on this reading of premise 3, the Exclusion Argument is invalid. The conclusion does not follow from premises 1-3 since it might be the case, as explained in interpretation 1, that a mental property term is identical to the disjunction of *multiple* arrangements of physical objects and properties. In which case, a particular mental event-token's mental properties are identical to some arrangement of physical objects and properties. So, it still might be the case that a mental event-token's mental properties partially determine its causal powers in virtue of the fact that the mental properties are identical to some arrangement of physical properties that have causal powers.

3. Is it the case that every time the term 'painfulness' truly applies *we know* which physical properties act as the truthmakers for the true sentence that includes the term 'painfulness'? No. It does not matter for the purposes of the Exclusion Argument whether or not we know or even have the ability to know which physical objects and properties act as truthmakers for sentences with mental terms. Whether or not we know or have the ability to know what the truthmakers are for sentences that mention mental property terms does not concern whether or not arrangements of physical objects and properties are the truthmakers for these sentences. It is whether or not the application and coapplication conditions mental properties terms *actually* are fulfilled by arrangements of physical objects and properties that will determine whether or not mental properties may truly be said to be causal. So, on this interpretation premise three comes out true. It's true that we know what physical objects and properties make true sentences that mention mental property terms. However, on this interpretation, the Exclusion Argument is invalid. Whether or not we know what the physical truthmakers are for sentences that

mention mental property terms is irrelevant to whether or not there actually are physical objects and properties that make true talk of the mental being causal.

Is premise 3 true outside of the ontology room? Which of the three interpretations is relevant given how we talk? It depends. It seems that in many contexts outside of the ontology room, outside of the physics room, outside of the neuroscience room, outside of the psychology room, questions of the identity and reducibility of the mental to the physical ought to be interpreted as epistemic questions. Thus, the relevant interpretation outside of the ontology in many contexts is the final interpretation. Ordinarily, it seems we are asking if we know or can know which physical things make sentences about the mental come out true. So, in many contexts outside of the above listed rooms, premise 3 comes out true. However, the truth of premise three should not lead a person outside of the ontology room to accept the conclusion of the Exclusion Argument. When considering whether or not the conclusion of the Exclusion Argument is true, we must use a metaphysical interpretation of premise 3. When we are asking what determines a thing's causal powers, we are asking a metaphysical question. It doesn't matter whether or not *we know* the physics or how to apply physical terms to a situation. So, when asking whether or not the conclusion of the Exclusion Argument is true, we need to use the first interpretation. In which case, premise 3 comes out false just as it does inside of the ontology room.

In this section I argued that we can truly say that mental properties are causal, but what makes these statements true is a combination of the application and coapplication conditions for mental terms and the occurrence of some physical events. Are there properties that correspond in a one-to-one manner to mental terms just as there are

properties that correspond in a one-to-one manner to microphysical terms such as 'charge'? No. That said, talk of mental properties as causal may be true.

4.3 Objections, Replies, and Clarifications

Now with an understanding of the view I'm putting forward, in this section I will address two pressing concerns that I anticipate people will have with the solution that I have proposed to the problem of mental causation. First, I will explain how my solution to the mental causation problem answers the '*qua* mental' objection. Second, I will address how some non-reductive physicalists might respond to my discussion of overdetermination.

4.3.1 Qua 'Mental' Objection

One might object to my view, claiming that the problem of mental causation stems from the intuition that mental events are causal *qua* being mental or having mental properties.[96] The objector might say that all my solution does is deny the intuition. The solution just claims that there are events that are causal and it's true to say that some of those events are mental. Since according to my solution 'there aren't any mental properties' is true inside the ontology room, this solution does not satisfy the intuition that it is truly the case that mental events are causal *qua* having mental properties.

This objection does not really understand the implications of my view. According to my solution to the mental causation problem, one can truly say that mental events are

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[96] Donald Davidson faces the same *qua* objection. For a discussion of the *qua* objection see Ernes Sosa's (1993) "Davidson's Thinking Causes". Davidson ("Mental Events", 1970) thought that there were events that could be described in mental terms or in physical terms and that both descriptions of the event were correct. He rejected the premise of the *qua* objection that events cause other events *qua* being some way or having some characteristic. My reply is different than Davidson's. This will become clear in what follows.

causal *qua* having mental properties. To understand why this is the case, consider the following sentence:

My pain causes me to scream *qua* the painfulness of my pain.

What makes this sentence true? Consider the following diagram:
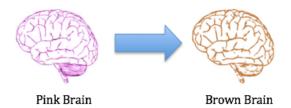

Pink Brain   Brown Brain

Image 4

The pink brain state causes the brown brain state. The pink brain represents a brain instantiating a certain arrangement of particles in space-time and the brown brain represents a brain instantiating a different arrangement particles. The brown brain represents the particle arrangement in my brain as I scream. What makes it true to say that the pink brain state is a pain state?[97]
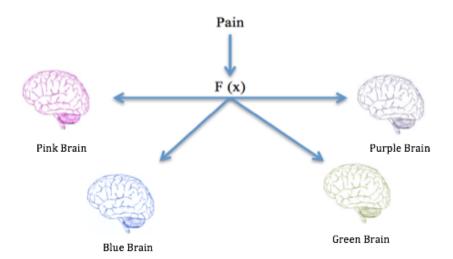

Image 5

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[97] More precisely, what makes it true to say that the arrangement of particles that the pink brain represents is a pain state?

The term 'pain' applies whenever something plays a certain functional role, F(x).[98] Certain brain states play the functional role picked out by F(x). The pink brain state, the blue brain state, the green brain state, and the purple brain state all play the functional role that the term 'pain' correctly applies to, as depicted above. This is to say that the brains all represent the instantiation of particle arrangements that play the functional role of pain. Therefore, the pink, blue, green, and purple brain states are all pain states in virtue of playing the functional role picked out by the term 'pain'.

The sentence 'my pain causes me to scream *qua* the painfulness of my pain' is made true by the fact that the pink brain state causes the brown state. The pink state is a pain state because it plays the functional role that the term 'pain' picks out. It is in virtue of its being the pink brain state, a pain state, that it causes the brown brain state. The same thing that makes it true to say that the pink brain instantiates a pain state also makes it true to say that the pink brain causes the brown brain state, namely the brain instantiating a certain arrangement of particles in space-time. It is the pink brain's having that arrangement categorized as pain, and that arrangement causing the brown brain state that makes it true to say, 'my pain causes me to scream *qua* the painfulness of my pain'. It's because my brain instantiates a certain arrangement that my brain causes me to scream. It's also in virtue of the fact that my brain instantiates that arrangement that it is true to say that I am in pain. It is in virtue of the fact that the same arrangement that makes-true

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[98] Perhaps you think that the term 'pain' doesn't always pick out a functional role, it can also pick out things that are physically identical to things that play a pain functional role, but that don't actually play the pain functional role. This is consistent with my view, just replace functional role, F(x), with functional role or physically identical to things that play the pain functional role, but don't play the functional role themselves.

'I am in pain' also causes me to scream that the painfulness of my pain is causal. So, the arrangement of particles that makes it true to say that someone is in a certain mental state will be the exact same arrangement of particles that make it true to say that that mental state causes another event.

It is ultimately microphysical particles and their properties that together play the pain functional role. So, for every event that may truly be categorized as a mental event, that event must be considered mental in virtue of the fact that the particles and properties that make up the event play a functional role that characterizes some sort of mental event. It's microphysical particles and their properties arranged in space-time that play some functional role such that we can correctly categorize certain events as mental events.

One might be concerned this explanation is ultimately the same as the non-reductive physicalist's explanation of what makes something mental, namely instantiating some arrangement. However, the key difference between the non-reductive physicalist view and my view is that I think that the truthmakers for causal claims about mental events and properties are microphysical particles and their properties located in space-time. The non-reductive physicalist that I disagree with thinks that mental properties are metaphysically irreducible to physical properties and that these irreducible mental properties are causal. Thus, it seems that the non-reductive physicalist doesn't think that physical objects and properties alone can make-true sentences that include talk of causal mental properties. So, the non-reductive physicalist seems to think that mental properties *really* exist. They seem to think that only mental properties can make-true sentences that include talk of mental causation. I don't think that there are *really* any mental properties. Mental properties aren't among the minimal truthmakers so they don't figure into the

correct ontology. Arrangements and patterns, which some take to be irreducible mental properties aren't admitted into my ontology, as they do not serve as minimal truthmakers. It is merely the case that, over the years, observed arrangements or patterns have led us to use a single predicate to describe them, namely 'pain'.

4.3.2 Scientific Realism Objection

I expect Van Gulick or other non-reductive physicalists will raise what I'll call the Scientific Realism Objection against the type of view that I am putting forward. First, I will explain Van Gulick's solution to the problem of mental causation and then I will present what seems to be his objection to a view like the one presented in this paper.

Van Gulick argues that mental properties overdetermine the causal powers of mental event tokens in a non-competing way and are therefore unproblematic. So, he rejects premise 3a. He explains that higher-level properties, such as mental properties, are those patterns that are picked out by the predicates of the special sciences. So, mental properties are the patterns that are picked out by the predicates of psychology and cognitive science. These patterns are recurrent and stable. They are the order of this world. For example, psychology uses the predicate 'pain' to pick out a certain causal role. The property of being in pain is to instantiate a certain pattern, a pain pattern. The pain pattern may include a composite being hooked up in a certain way and its constituents being arranged in a certain way. Van Gulick explains "the causal powers of composites aren't determined solely by the physical properties of its constituents and the laws of physics, but also by the organization of those constituents within the composite" (Van Gulick, 1993, p. 250). He then asks the reader, "But why should we not regard these patterns as real and causally potent? Consider what might be said on behalf of their

reality" (1993, p. 251). Van Gulick goes on to argue and conclude that we should regard these patterns as real and causal.

Van Gulick argues that the explanatory work that these higher-order properties, which are patterns, allow us to accomplish justifies our acceptance of them. Without them we would not be able to understand our world on a level that allows us to predict future states of our world. The causal explanations that are given by higher-level properties and the causal explanations given by base level properties serve different pragmatic purposes and are useful in different conceptual frameworks. They do not conflict and their use justifies our acceptance of them.

Although Van Gulick does not frame his reason to accept mental properties as a response to the concern that the most parsimonious view of mental causation does not include mental properties, we can take Van Gulick's view as a reply to this concern. I take it to be the case that Van Gulick is claiming that the success of the sciences that aren't microphysics in reliably predicting certain outcomes, such as in neuroscience, cognitive science, and psychology, provides us with evidence that mental properties actually exist. He might argue, the best view of mental causation, whether or not it is the most parsimonious, must include the properties that are posited in the special sciences that deal with mental causation and this includes mental properties. In order to best account for *all* of the evidence, we should posit properties that correspond in a one-to-one manner to the predicates of the special sciences. When counting all of the properties in the world, we should not just count microphysical properties; we should also count mental properties.

The problem with Van Gulick's response is that the explanatory power provided by the predicates of the special sciences and usefulness of special science predicates only gives us evidence of the fact that special science predicates are crucial for humans, given our capabilities, to predict outcomes. I am not disputing their usefulness. I am arguing that a predicate's usefulness is not evidence of that predicate corresponding in a one-to-one manner to a property that *really* exists. It seems that we can use the predicates of the special sciences to categorize and discuss token mental events that are relatively similar to one another and because of their relative similarities we can predict outcomes based on these categories that are picked out by the predicates of special sciences.[99]

That said, I think that what we mean to be talking about when we discuss mental properties outside of the ontology room might sometimes be the patterns that we can pick out when looking at multiple cases of what we consider to be instances of a certain type of mental property. The property of a particle being located at a certain place in space-time is certainly causal and when we as human see some particles arranged and some other particles arranged congruently, we tend to generalize and think that there is something real and causal that both sets of particles instantiate. In fact, their individual arrangements are causal, but there is nothing ontologically significant or causal, not even a pattern, that they both instantiate. We, as humans, are just good at picking out relevant similarities between sets of particles.

Now, one may ask 'why is it not the case that 'having a certain pattern' is a property that is instantiated by my many groups of particles?' Patterns may be instantiated by many different realizers. Why is it not the case that these different realizers having the

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[99] John Heil (1999) makes a similar argument in his paper "Multiple Realizability".

property of 'having a certain pattern' is causal? It seems like we don't have any evidence or reason to think that there *really* is such a pattern. Pattern talk does not correspond in a one-to-one manner to fundamental particles or properties. All of our supposed evidence of patterns can be accounted for by merely positing particles and their properties in space-time. Certainly, if a group of particles were not in a certain arrangements, the group of particles would not have the same causal powers. However, this doesn't show that the arrangement itself is causal. This shows that the individual particles act differently given different surroundings. There are certainly arrangements that we can pick out as similar, but that doesn't mean that there is *really* a pattern property that both arrangements instantiate. There is no need to claim that there is some property, a pattern property, if all of the supposed causal powers that would be attributed to the pattern property can be accounted for by some particles and their specific locations in space-time. There are merely causal powers that both arrangements have due to their individual microphysical constituents, which seem to be so similar enough to us, so we call them by the same predicate.

Now, Van Gulick may respond to my argument by claiming that I am assuming a certain methodology for deciding on an ontology that does not take scientific explanation seriously. I am assuming that one ought to choose the sparsest ontology that can account for the evidence that we have. Van Gulick may claim that we ought to choose the sparsest ontology that allows us to be realists about scientific explanation. He might argue that the fact that scientists use predicates such as 'painfulness' and 'being a neuron' and the success of science in predicting the future using these predicates is evidence that these

predicates are real and causal. It is more important to be realists about scientific explanation than it is to have a sparse ontology.

My answer to this line of objection is just that scientific explanation should not guide metaphysical ontology such that when a predicate is useful in scientific explanation, there must be a property that corresponds to that predicate. The goal of scientists may not be to find out what *really* exists and then only use language that commits them to those things. Scientists aren't required to talk as though they are inside of the ontology room. One of their goals might be to explain the world in a way that helps humans understand the world and to be able to predict the future given certain inputs. It seems that as long as we as philosophers can explain how it is that the scientists are actually correct, we ought to not hold our ontology hostage to the predicates of scientists. Scientists seem to form predicates that correspond to events that are just similar enough that the relevant predicates are useful in making predictions about those similar enough events. The predicates are used to group similar events that will be followed by other similar events. The scientists are correct, but the predicates that they use much of the time are meant to generalize in a useful way and not to describe the world in the most perspicuous manner. Thus, we should not read our ontological commitments straight off of the predicates that are useful to scientists.

In addition, scientists don't seem to be claiming that there *really* is something that all similar instances have. It seems that they are just identifying patterns that are useful or essential for us to pick out in order to practice science. But, the fact that these some of these patterns are essential to our discovery and understanding of world, doesn't mean that they *really* exist. It would be anthropocentric to conclude from the fact that a

predicate that picks out a pattern that is essential to our understanding of the world, that that predicate is irreducible and picks out a pattern that *really* exists. The patterns themselves aren't doing the causal work; only the particles and their properties in space-time are doing the causal work. However, identifying relative similarities amongst particles and property arrangements in space-time is convenient, useful, and in some cases essential to our practice of science.

In addition, scientists don't seem to be claiming that these patterns are real or causal. They aren't claiming that patterns *really* exist. They aren't claiming that when we count what properties there are, we need to not only count the microphysical properties, but we also need to count 'being in a certain pattern' properties. They are merely claiming that we can identify congruencies in token phenomena and that these congruencies lead to similar future phenomena. So, we can expect that particles that have congruent arrangements will have certain similar causal powers. However, it is still the case that these causal powers are numerically distinct. There is not a pattern property that instances of pain actually share. They merely have congruent patterns such that they cause things that are similar. Just because some predicate is essential to our discovery and understanding of some scientific theory does not entail that the predicate corresponds to a single property. Before we take our ontology to be the result of scientific explanation we should look at what actually must exist in order for us to claim that the scientists are correct. In addition, we should look at what the goal of the relevant scientific explanation is.

One might object to my reply to Van Gulick claiming that I rely on the very thing, explanatory virtues, that I argue against. I argue that we should not add mental properties

to our ontology because we need not add mental properties to our ontology in order to account for all of our evidence and we should favor a theory that is more parsimonious. However, arguing in a way that relies on parsimonious explanations being the explanations that are more likely to be true, relies on the very thing that I argue we should not base our ontology on. I argue that the predicates needed in scientific explanation need not guide our ontology. Parsimony and explanation are both theoretical virtues, so I argue against using one theoretical virtue in doing ontology only to rely on another.

I actually think that both the theoretical virtues should guide our ontology. However, I interpret the theoretical virtue of explanation as claiming that we must be able to account for the evidence given our ontology. We should be able to create theories, given our ontology, that have predictive power. I think that my ontology can account for the data that the special sciences have given us and it does not prevent us from creating theories that have predictive power. We may use predicates that don't correspond to properties, but that does not mean that the predicate can't be used to make predictions. The predicate may just pick out arrangements of properties and allow us to create predictive theories at a level that we understand. I don't think that the theoretical virtue of explanation requires that we posit a corresponding object or property for any term that is used in a useful explanation of our data.

In this paper I have explained the Exclusion Argument, argued that overdetermination is not a good solution to the Exclusion Argument, and dissolved the Exclusion Argument by arguing that premise 3 properly understood is false inside the ontology room. In addition, I have offered a list of desiderata for a solution to the Exclusion Argument and demonstrated that my solution meets these desiderata. Finally, I sketched a couple

objections that I foresee to the type of view of mental causation that I have sketched out

and I have offered replies to these objections.

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