A Critique of Reductive Accounts of the Source of Necessity

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Abstract

The original objective of this research project was to provide a reductive account of the source of the necessity that makes necessary truths necessarily true. After a close examination of existent reductive accounts of the source of necessity, my goal has changed. In this dissertation I argue the prospects for a reductive account of the source of necessity are not at all promising. I begin by examining and critiquing accounts of the source of necessity that claim we, humans, are in some way or other responsible for making necessary truths necessarily true (what I am calling "Dependent Accounts of the source of necessity"). I raise two critical problems with Dependent Accounts of the source of necessity, which effectively rule out all Dependent Accounts of the source of necessity. I then consider two Nondependent Accounts of the source of necessity (Modal Realism and Essentialism). I argue that both of these accounts of the source of necessity are problematic. Importantly, the major problem with Essentialism is that it does not provide us with a way to account for the necessary features of alien possible beings, so it is at best an incomplete account of the source of necessity. This problem with Essentialism effectively rules out any Nondependent Account of the source of necessity that tries to locate the source in our world. Lastly, I examine the implications of it being a brute fact that certain truths are necessary and propose some future research projects based on my findings.

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Introduction

The proposition that there is a half dozen bottles of beer in a fresh six-pack of bottled beer is true. It is fairly easy to see why this is the case. The truth of this proposition consists in a fact about six-packs of bottled beer. All fresh six-packs of bottled beer contain six bottles of beer. If all fresh six-packs of bottled beers contain six bottles of beer, then they all contain a half dozen bottles of beer. This, however, is not all that can be said about the truth of this proposition. It could never be the case that there is more than a half dozen bottles of beer in a fresh six-pack of bottled beer. And it could never be the case that there are less than a half dozen bottles of beer in a fresh six-pack of bottled beer. So, the proposition that there is a half dozen bottles of beer in a fresh six-pack of bottled beer is not only true, it is necessarily true. One of the pressing questions in the metaphysics of modality is: What is the source of the necessity that makes necessary truths (like this one) necessarily true? Let's call this "the Source of Necessity Question" (SNQ). SNQ is the primary question that will be addressed in this dissertation; however, it is important to keep in mind that finding an answer to SNQ would provide us with a foundational explanation of metaphysical, logical, and mathematical modality (necessity, possibility, contingency, etc.) in general.[1] I will be arguing that there is no cogent answer to SNQ. In other words, I will argue that all reductive accounts of the source of necessity are incorrect.

Why might someone be interested in the project of finding a foundational explanation of modality? There are many reasons for embarking on such an endeavor –

[1] I will not be addressing questions about nomic modality or epistemic modality directly in this project.

here are a few. First, Saul Kripke's work on formalizing a modal logic in the middle of the twentieth-century, as well as the work of others, has greatly expanded our understanding modality. With the introduction of formal systems to model modality, we not only have a greater understanding of how modality works in language (both propositions with *de dicto* modality and propositions with *de re* modality), but also a greater understanding of how to think about metaphysical modality. The development of modal logic, therefore, has given us a greater understanding of how we should use modal notions in our theorizing and the formal models have also, arguably, contributed to the rebirth of metaphysics after it all but disappeared in the early twentieth-century due to the Logical Positivist movement at that time.[2] Second, logical truths and mathematical truths are thought to be necessary. Finding an explanation for the source of the necessity of those truths could provide the philosophers of mathematics and logic with insight into their logical and mathematical theories. For instance, if the source of the necessity that makes necessary truths necessary is to be found in our conventions, then the source of the necessity of the logical and mathematical truths is also found in our conventions. That would mean that those truths' necessity is contingent on the conventions that we have adopted. Perhaps that fact could be used in support of an antirealist account of logic and mathematics. For the antirealist, logic and mathematics are convenient tools that can be used to understand reality, but they are not substantive parts of reality. If the source of the modality of the truths of logic and mathematics is in our conventions, then that fact could be used to bolster the antirealist's claim that logic and mathematics are not part of

[2] We will discuss the Logical Positive answer to SNQ in Chapter 1. We will be examining Conventionalism in great detail in that chapter.

reality.[3] Finally, foundational questions about modality are important in the discipline of philosophy to the extent that philosophers often use modal terms (e.g. 'necessary', 'possible', 'could', 'contingent', etc.) in their theories.[4] What is desired is a epistemological account of how our modal terms match up with reality. Oftentimes, when a philosopher claims that some proposition X is necessarily true she is claiming X is genuinely (i.e. metaphysically) necessarily true. For example, an ethicist might claim the proposition that happiness is a requirement of human wellbeing is genuinely (i.e. metaphysically) necessarily true. Let's call that proposition "PROP-happy". If PROP-happy is genuinely (i.e. metaphysically) necessarily true, then the ethicist is making a strong claim. For PROP-happy to be necessarily true in this sense, it must be the case that there is no scenario (or possible world) where humans exist and happiness is not a requirement for human wellbeing. The ethicist might support her claim by explaining how it is inconceivable that there could be a scenario (or possible world) where happiness is not a necessary requirement for human wellbeing. Now, we might think that the ethicist is wrong about happiness being a metaphysically necessary requirement for human wellbeing, and to challenge her claim we would argue that there is some conceivable scenario (or possible world) where human well-being does not require happiness. What we end up with, then, are two opposing claims about what is, or is not, metaphysically necessary for human wellbeing. What makes it the case that happiness is,

[3] I am not claiming that by merely accepting a theory in which modalities are based on conventions makes one an antirealist about logic and mathematics. As well see in Chapter 3, Ted Sider claims that logic and mathematics are part of the fundamental structure of the world; however, for Sider, the fundamental structure of the is nonmodal.

[4] The use of modal terms is widespread (in the humanities as well as the sciences) and their use is a crucial aspect of our theorizing. Hence, this question of the source of necessity is important for all disciplines.

or is not, a metaphysically necessary condition for human wellbeing? What grounds that metaphysical fact?

Answering SNQ is a project in metaphysics – we want, after all, to find the source of necessity. Before we discuss direct answers to SNQ, let's begin by discussing two indirect answers to SNQ. One indirect answer to SNQ is to say that SNQ is nonsense – the question is a question about something that does not exist. This would be to take an Eliminativist position – there is no such thing as modality.[5] We do, however, use modal notions, so the Eliminativist would need to provide us with some kind error theory to explain why we all – and really all of us – are making mistakes when we use modal notions in our theorizing and our everyday lives. I will not be examining Eliminativism in this dissertation due to the highly intuitive thought that we are not always making a mistake when we say something is possible or when we say something is necessary. It seems highly intuitive to me that the proposition that Jane and John Clemens are Samuel

[5] Daniel Nolan, in "Three Problems for 'strong' Modal Fictionalism," explicates a form of Modal Fictionalism, which he calls 'Broad Fictionalism', that is Eliminativist. The Broad Fictionalist claims that both possible worlds and modal claims themselves are fictions (Nolan, pp. 261-2, 1997). If modal claims are themselves fictions, then there really is no such thing as modality insofar as all modal claims are literally false. If there is no such thing as modality, then trying to find its source is a fool's errand. More moderate versions of Modal Fictionalism, such as Gideon Rosen's Modal Fictionalism in "Modal Fictionalism," are only fictionalist about possible worlds (they are not factionalist about modal claims – modality in general) (Rosen, p. 330, 1990). I will not be considering the moderate versions of Modal Fictionalism directly in what follows. The reason for this is that even if the possible worlds are convenient fictions for modeling modality, the moderate Modal Fictionalist is not a fictionalist about modality in general, which means that Modal Fictionalism is not a metaphysical account of the source of necessity; rather, it is an account of the semantics of modal claims. In other words, the Modal Fictionalist will not be able to answer SNQ, which is a question about the metaphysics of modality, using her fictionalist theory of the sematics of modality. It is important to note that D.M. Armstrong, in *A Combinatorial Theory of Possibility*, is a fictionalist about possible worlds. However, his account of the source of modality is Actualist. For the Actualist, the only things that exist are things in the actual world. Armstrong's Combinatorial Theory of Possibility is an account of how to build convenient fictions to account for the semantics of modality; however, the source of the modality is the actual world. That is why, according to Armstrong, "there is, however, one contraction with a Combinatorial theory cannot accept. In cannot countance the empty world. For the empty world is not a construction from our given elements (actual individuals, properties and relations)" (Armstrong, 1989, p. 63). Willard Van Orman Quine, of course, was a Modal Eliminativist.

Clemens' parents, but not Mark Twain's parents is necessarily false – I have high confidence in the modality of that proposition.

The second indirect answer to SNQ is to say that it is a brute fact that the necessary truths are necessarily true. This indirect answer to SNQ is challenging the claim that there is a *discoverable* source of the necessity that makes necessary truths necessarily true – i.e. to say that SNQ is unanswerable. To address SNQ in this way is to accept a form of Primitivism – there is such a thing as modality, but modality is unanalyzable to the extent that it is not reducible to some other nonmodal phenomenon that serves as its source. Now, Primitivism is often thought of as a position of last resort – the position that you take when you can't find a solution to a problem. It is also thought to be problematic for metaphysics. Metaphysicians want to provide us with a complete account of reality and the more unexplainable phenomena they accept (i.e. the more brute facts that they accept), the less of reality they are explaining. Metaphysicians also like desert landscapes – parsimony is a theoretical virtue. The fewer phenomena that you have to accept as brute fact of reality, the sparser your landscape; hence, the better your theory. Nevertheless, at some point we do have to take some phenomena as primitive – in order to build a theory, we will at the very least need to take some assumptions that provide us with a foundation to get our theory started. If there is a good reason for taking modality as primitive, then so much the worse for the desire for a sparse landscape. I will be arguing that there are good reasons for taking modality primitive

insofar as there are deep theoretical problems with reductive accounts of the source of necessity. I will ultimately end up in the Primitivist camp.[6]

What SNQ is challenging us to do, basically, is to formulate a reductive account of the source of the necessity that makes necessary truths necessarily true. In other words, to directly answer SNQ, we need an account of the source of necessity that does not appeal to modal notions in its explanation of the source of necessity. If it were to appeal to modal notions, it would not be a reductive account of the source of necessity. For example, if our answer to SNQ is that the necessary truths are necessary because they are true at every possible world, we are appealing to the modal notion of 'possible world' in our account. What makes those worlds possible? If the answer to this question is that they just are possible, then this is a Primitivist account of the source of necessity. There are two broad categories that reductive accounts of the source of necessity fall under – (1) accounts that claim humans are in some way or other the source of the necessity that makes necessary truths necessarily true, let's call these accounts "Dependent Accounts" (I will explain why I have labeled these accounts in this way in the next section), and (2) accounts that claim the opposite – humans are in no way the source of the necessity that makes necessary truths necessarily true (let's call these accounts "Non-dependent Accounts").

[6] I must confess that I did not start in the Primitivist camp. I had originally thought that a realist account that located the source of necessity in the actual world (our world) would be the correct account. However, after developing arguments against Kit Fine's Essentialist account of the source of necessity in Chapter 5, I realized those arguments are just as effective against any account that tries to locate the source of necessity in the actual world. Maybe at some point in time I will have an inspired idea that revitalizes my thought that the source of necessity is located in the actual world, but at the time of the writing of this dissertation, it has not come to me.

I.1 Dependent Accounts and Nondependent Accounts of the Source of Necessity

Dependent Accounts of the source of necessity all claim that we, humans, are in one way or another the source of the necessity that makes necessary truths necessarily true. Now, if we are the source of necessity that makes necessary truths necessarily true, why not call this category of reductive accounts of the source of necessity "Subjective Accounts"? The answer to this question has to do with some subtilties associated with various existent Dependent Accounts of the source necessity. 'Subjectivity' is often associated with our feelings, thoughts, etc. – i.e. our psychologies. Some Dependent Account theorists contend that key parts of modality (e.g. the various divisions between the possible worlds and the impossible worlds) are not dependent on our psychological states. For example, Ross Cameron claims that there is a non-natural, yet mind independent, distinction between the possible worlds and the impossible worlds (this claim will be explained in detail in Chapter 2) (Cameron, 2009, p. 13). If the distinction is mind independent, then it is not subjective – at least not on the interpretation of 'subjective' given above. To remain as neutral as possible, then, I have named these theories "Dependent Accounts".

Within the category of Dependent Accounts of the source of necessity, there are three subcategories.[7] The first subcategory is the Conventionalist Dependent Accounts of

[7] I will be focusing exclusively on fairly recent Dependent Accounts of the source of necessity in this dissertation. This is by no means to indicate that Dependent Accounts of the source of necessity are a recent phenomenon. The beginnings of a Dependent Account of the source of necessity can be found in Book III of John Locke's *An Essay Concerning Human Understanding*. According to Locke, "'Tis true, I have often mentioned the *real essence*, distinct in substances, from those abstract *ideas* of them, which I call their *nominal essences*. … Indeed, as to the *real essences* of substances, we only suppose their being, without precisely knowing what they are: but that which annexes them still to the *species*, is the nominal essence, of which they are the supposed foundation and cause. … And … the *species of things to us, are nothing but the ranking them under distinct names, according to the complex* ideas *in us*; and not according to precise, distinct, real *essences* in them …" (Locke, 1996, pp. 194 – 197, Lock's italics). For Locke, we

the source of necessity. I am taking 'convention' to mean what I think most people think it means, including Ted Sider. To have a convention is to have a choice between at least two equally good alternative candidates (either candidate, if chosen, would allow us to accomplish our goals), the choice is something that we are (at least minimally) aware of, and we are aware of the alternative candidates (Sider, 2011, p.56). There are three different existent Conventionalist Dependent Accounts of the source of necessity. First, there is Conventionalism. Roughly, for the Conventionalists, necessary truths are *both* true and necessary by convention. Conventionalism will be examined in Chapter 1 (we will be primarily focusing on Rudolf Carnap's version of Conventionalism in that chapter). Second, there is Ross Cameron's Neo-conventionalism. For the Neo-conventionalist, necessary truths are necessary by convention; however, necessary truths' truth is not dependent on convention. Cameron's Neo-conventionalism will be examined

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cannot know if things have real essences; however, we do use nominal essence (i.e. essences by name only) to rank different things. Now, if the rankings of these things are based on our conventions and the nominal essences of these things are determined by us, then the source of the necessity of these nominal essence (the only kind we have access to) is located in our conventions. This would be a Dependent Account of the source of necessity.

Another example of a historical Dependent Account of the source of necessity can easily be extrapolated from David Hume's skeptical solution in *An Enquiry Concerning Human Understanding*. According to Hume, "The matter [the acceptance of the doctrine of necessity], I think, may be accounted for, after the following manner. If we examine the operations of body, and the production of effects from their causes, we shall find, that all our faculties can never carry us farther in our knowledge of this relation, than barely to observe, that particular objects are *constantly conjoined* together, and that the mind is carried, by a *customary transition*, from the appearance of one to the belief of the other. … But being once convinced, that we know nothing farther of causation of any kind, than merely the *constant conjunction* of objects, and the consequent *inference* of the mind from one to another, and finding, that these two circumstances are universally allowed to have place in voluntary actions; we may be more easily led to own the same necessity in common to all causes" (Hume, 1993, p. 61, Hume's italics). Hume is clearly talking about the necessary connection between a cause and its effect in this passage, but it is easy to see how this line of reasoning could be extended to explain the source of the necessity of all necessary truths. Our minds, in one way or another, project a certain structure onto our experiences. This projection involves taking certain truths as necessary – in the same way that we come to necessarily expect the effect *E* after experiencing its cause *C*. This too would be a Dependent Account of the source of necessity. Ted Sider, in part, named his theory "Humeanism" to acknowledge Hume's insights that are evident in the above passage.

in Chapter 2. Lastly, there is Sider's Conventionalist Humeanism. For the Conventionalist Humean, the fundamental structure of the world is nonmodal. We, by convention, label certain truths as 'necessary'. Sider's Conventionalist Humeanism will be examined in Chapter 3.

The second subcategory of Dependent Accounts of the source of necessity is the Projectivist Dependent Accounts subcategory.[8] These accounts are not conventionalist to the extent that we are not *choosing* between two equally good alternatives candidates, we are not aware that we have adopted one of the candidates over the others, and we are not aware that there are alternative candidates that we could have chosen. Rather, necessity is something that we project onto reality.[9] We will be looking at Sider's Projectivist Humeanism in Chapter 3. Sider leaves some of the important details of Projectivist Humeanism unexplained. In Chapter 3, I propose two ways of understanding how we project necessity onto reality. The first account I give uses the notion of intelligibility to explain how we project necessity onto reality. The truths that we label as 'necessary' are the truths that are true at every intelligible world. The second account I give is inspired by Ludwig Wittgenstein's notion 'form of life'. We do label certain truths as 'necessary', but the only explanation of why we do this is that labeling certain truths as 'necessary' is something that we do – that is just a fact about the way we are and there is nothing more to be said (a deflationary account).

[8] "Projectivism" is Ted Sider's name for these types of accounts.
[9] Sider also calls these accounts "Subjectivism", which is in accordance with the definition of 'subjective' given about. For the Projectivist, it ultimately is something about us – our psychologies – that explains why we label certain truths as 'necessary'.

The third, and final, subcategory of Dependent Accounts of the source of necessity is the Combination Dependent Accounts subcategory. As is evident by the name, Combination Dependent Accounts of the source of necessity claim that the source of some necessary truths' necessity is to be found in our conventions, and the source of other necessary truths' necessity is to be found in the way that we project necessity onto reality. This is, ultimately, the position that Sider half-heartedly endorses, which I call "Combination Humeanism". Sider thinks that *most likely* an account that explains some necessary truths are labeled 'necessary' via convention and other necessary truths are labeled 'necessary' via projection will be the correct account (Sider, 2011, p. 269). Combination Humeanism will also be examined in Chapter 3.

Nondependent Accounts of the source of the necessity that makes necessary truths necessarily true, on the other hand, are all accounts that do not locate the source of necessity in some aspect of the human condition.[10] In Chapter 5, I will examine two

[10] As was the case for Dependent Accounts of the source of necessity, I will be exclusively focusing on fairly recent Nondependent Accounts of the source of necessity in this dissertation. Once again, this is by no means to indicate that Nondependent Accounts of the source of necessity are a new phenomenon. A Nondependent Account of the source of necessity can easily be extrapolated from the work of Aristotle. Aristotle, in *Parts of Animals*, explains, "Now in the works of nature the good end and the final cause is still more dominant than in works of art such as these, nor is necessity a factor with the same significance in them all; though almost all writers, while they try to refer their origin to this cause, do so without distinguishing the various senses in which the term necessity is used. For there is absolute necessity, manifested in eternal phenomena; and there is hypothetical necessity, manifested in everything that is generated by nature as in everything that is produced by art, be it a house or what may" (Aristotle, 2001, 639^{b}-20). It is clearly evident in this passage that Aristotle has a Nondependent Account of the source of necessity based on his teleological worldview and his notion of final cause (i.e. essences). More evidence of Aristotle's thoughts on the source of necessity can be found in the *Metaphysics*. There Aristotle explains, "now some things owe their necessity to something other than themselves; others do not, but are themselves the source of necessity in other things" (Aristotle, 2001, 1015^{b}-10). If essences are the source of necessity, which would be the case if we are considering final cause, then the source of the necessity of the things that do not dependent on other things for their necessity is their essences. Kit Fine's Essentialism is loosely based on certain aspects of the Aristotelian account of essences.

Another historical Nondependent account of the source of necessity can be found in the work of Baruch Spinoza. In Proposition 8 in Part II of *The Ethics*, Spinoza states, "The ideas of nonexisting individual things or modes must be comprehended in the infinite idea of God in the same way as the formal essences of individual things or modes are contained in the attributes of God" (Spinoza, 1992, p. 65). I

Nondependent Accounts of the source of necessity in depth. The first Nondependent Account that I will examine is David Lewis' Modal Realism. According to the Modal Realist, the necessary truths are necessarily true because they are true at every concretely existing world (note that the claim is not appealing to possible worlds – for Lewis, however, these concretely existing worlds end up being the possible worlds). The source of necessity, then, appears to be the concretely existing worlds. The second Nondependent Account that will be evaluated in Chapter 5 is Kit Fine's Essentialism. Fine argues that necessities should be understood in terms of essences (as opposed to the more standard way of understanding essences in terms of necessities). Fine utilizes an older notion of 'essence' – 'real definition' – in his theory. The source of necessity, for Fine, is located in the real definitions of things (broadly construed) that exist in the actual world. For both the Modal Realist and the Essentialist, humans do not determine which truths are necessarily true. Rather, aspects of reality determine which truths are necessarily true. For the Modal Realist, the aspect of reality that determines which truths are necessarily true are the concretely existing worlds. For the Essentialist, the aspect of reality that determines which truths are necessarily true are the essences of things (broadly construed) that exist in the actual world.

There is one last, logically possible, type of account of the source of necessity that needs to be discussed. Accounts of this type would be combination accounts – accounts

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choose this proposition for two reasons. First, it clearly exemplifies Spinoza idea that essences of things or modes, i.e. their necessary attributes, necessity is located in the attributes of God. It is tempting to think that if, as Spinoza claims, there is one substance – God – and we are modes of God, then we are the source of necessity. This is incorrect, however, to the extent that it is the attributes of God, not the individual modes of God, are the source of necessity. Second, this proposition tells us how we ought to think about nonexistent things or modes. Nonexistent modes of God must be comprehended in the infinite idea of God – that is, there nonexistence must be comprehended as having essences that are contained in the attributes of God.

that locate the source of some of the necessary truths' necessity in some aspect of the human condition and locate the source of other necessary truths' necessity in something that is not associated with the human condition. Let's call these types of accounts "the Mixed Accounts". One of the problems with Mixed Accounts of the source of necessity is devising a principled demarcation between the necessary truths that are necessarily true due to some aspect of the human condition and the necessary truths that are necessarily true due to something that is not associated with the human condition. Another, more pressing problem, with Mixed Accounts of the source of necessity is redundancy. Suppose that we want to know the source of the necessity of the following two propositions:

PROP-Twain: Mark Twain is identical to Samuel Clemens.

PROP-add: $2 + 2 = 4$.

Both PROP-Twain and PROP-add are necessarily true. Now, suppose that the Mixed Account theorist claims that the source of the necessity of PROP-Twain is located in our conventions and that the source of PROP-add is located in the concretely existing worlds (we'll suppose that she is a partial Modal Realist). PROP-add, then, is necessarily true because it is true in every concretely existing world. PROP-Twain is necessarily true via human convention. Yet, if PROP-Twain is necessarily true via human convention, is it true in every concretely existing world? Suppose that PROP-Twain is not true in every concretely existing world. If that were the case, PROP-Twain would not be necessarily true in the concretely existing worlds part of the Mixed Account. So, according to the Mixed Account, PROP-Twain is both necessarily true and not necessarily true. Yet, this result seems absurd – how can there be a concretely existing world where PROP-Twain is

false – a world where the necessity of identity fails? If the necessity of identity does fail at that world, why is PROP-add true at that world? The only way to avoid this disastrous outcome is to claim that PROP-Twain is also necessarily true at every concretely existing world. If PROP-Twain is true at every concretely existing world, then we do not need to make it necessarily true by convention – it's already necessarily true. This is, of course, presupposing that the existent worlds are more fundamental than our conventions. But that seems correct – conventions are contingent on us whereas existing world are not contingent on us. It appears, then, that Mixed Accounts of the source of necessity are introducing theoretical machinery (in this case, conventions) that is not doing any work. In other words, one of the sources of the necessity in Mixed Accounts of the source of necessity will be redundant.

I.2 Structural Objections to Dependent Accounts of the Source of Necessity

I have devised two structural objections that I utilize against the various Dependent Accounts of the source of necessity. The first structural objection I call "the Incompleteness Objection." The primary targets of the Incompleteness Objection are Dependent Accounts of the source of necessity that rely on conventions (i.e. Conventionalist Dependent Accounts), although I do use it elsewhere.[11] The Incompleteness Objection is inspired by Simon Blackburn's insights in "Morals and Modals." In that paper, Blackburn proposes a dilemma for any reductionist theory that champions the claim that there is a source of the necessity that makes necessary truths necessarily true. According to Blackburn, either the source of the necessity is itself

[11] I also use the Incompleteness Objection in my replies to responses to my arguments in Chapter 4: Global Modal Error. 'Global modal error' will be explained shortly.

contingent or it is necessary. Therein lies the problem. On the one hand, if the source of the necessity is contingent, then it is possible that the source of the necessity does not obtain, which in turn means that the necessity of the necessary truths that it grounds do not obtain. Hence, the necessary truths are not necessary if the source of the necessity does not obtain. On the other hand, if the source of the necessity is itself necessary, then we need to explain the source of its necessity. We can either appeal to another necessity, which is the beginning of an infinite regress, or we could appeal to the original source of necessity, which is circular (Blackburn, 1993, p. 53).

Now, the details of how the Incompleteness Objection is an objection to Conventionalism, Neo-conventionalism, Conventionalist Humeanism, and Sider's Combination Humeanism (all of the Conventionalist Dependent Accounts of the source of necessity) do differ; however, the general strategy is the same. In the Incompleteness Objection, I find a proposition *P* (or propositions) that must be true (i.e. *P* is necessarily true) if the Conventionalist Dependent Account under consideration is the correct account of the source of the necessity that makes necessary truths necessarily true. I then show that that Conventionalist Dependent Account of the source of necessity cannot explain the source of proposition *P*'s necessity using its own theoretical framework. In other words, the source of proposition *P*'s necessity is not located in some of convention that we have adopted. If the source of proposition *P*'s necessity is not located in some convention that we have adopted, then the Conventionalist Dependent Account of the source of necessity is, at best, an incomplete account. Not being able to locate the source of the necessity for every necessary truth is very problematic. First, why would there be different sources of the necessity that make necessary truths necessarily true? Second, if

there is some other source of the necessity for proposition P's necessity, why isn't that the source of the necessity of all the other necessarily true propositions? Lastly, being unable to locate the source of the necessity for every proposition is tantamount to not having an answer to SNQ. SNQ demands an answer that accounts for the source of the necessity of *all* necessary truths. [12]

In order to address the Incompleteness Objection, the Conventionalist would need to devise an account of the source of the necessity for proposition *P*'s necessity, which cannot be accounted for using her original theory, that does not locate the source of proposition *P*'s necessity in conventions (if the source of its necessity can be located). There is doubt whether the new source of necessity can be justified in a non-*ad hoc* way due to proposition *P*'s importance to Conventionalist Dependent Account of the source of necessity. In other words, the justification for the new source of necessity for certain propositions should not just be that there are two sources of necessity because the new source of necessity is needed to make her original theory work. In addition, there would be the need to add principled qualifications to the modified Conventionalist Dependent Account of the source of necessity to explain why certain truths are necessary by convention and why other truths are not necessary by convention. Once again, there is doubt whether the qualifications can be formulated in a non-*ad hoc* way due to proposition *P*'s importance to the Conventionalist Dependent Account of the source of

[12] In Chapter 5 I argue that Fine's Essentialist account of the source of necessity is also an incomplete account. I go on to explain that any Nondependent theory of the source of necessity will also be an incomplete account. The source of the incompleteness is drastically different than source of the incompleteness for Dependent Accounts of the source of necessity. For that reason, I am not including it as part of the Incompleteness Objection that I am discussing here.

necessity. The prospect, then, of giving a principled account of the two sources of necessity is unpromising.

The second structural objection that I have created targets all Dependent Accounts of the source of necessity. This objection is the primary topic in Chapter 4: Global Modal Error. In that chapter I argue that Dependent Accounts of the source of necessity are incompatible with the genuine epistemic phenomenon that I call "global modal error". A global modal error occurs when we, as a collective, mistakenly think that a proposition *P* has a certain modal status when it in fact has another modal status. For instance, we might mistakenly think that proposition *P* is necessarily true when in fact it is only contingently true. If proposition *P* is only contingently true, then we're making a mistake when we think that it is necessarily true. The details of how the different Dependent Accounts of the source of necessity are incompatible with the genuine epistemic phenomenon of global modal error differ; however, once again, there is a structural feature of all Dependent Accounts of the source of necessity that is the root cause of their incompatibility with global modal error. None of the Dependent Accounts of the source of necessity can provide us with a basis of comparison, which I argue is essential for accounting for global modal errors. They do not provide us with a base of comparison because we, humans, are the source of the necessity that make necessary truths true. In other words, there is no way that we can be mistaken about the modal status of any proposition insofar as we determine the modal status of every proposition. Hence, Dependent Accounts of the source of necessity are incompatible with the genuine epistemic phenomenon of global modal error due to structural features of those accounts.

I.3 Chapter Summaries

In this section I will provide brief summaries of the chapters to follow.

I.3.1 Chapter 1: Truth and Necessity by Convention: A Critique of the Conventionalist's Account of the Source of Necessity

In the first chapter I consider the Conventionalists' dependent account of the source of necessity (I primarily examine Rudolph Carnap's account since it is one of the most developed accounts and is popular with deflationists about truth and reference today). For the Conventionalists, the only truths that are necessarily true are the analytic truths. The hackneyed example of an analytic truth is expressed in the sentence, "All bachelors are single males." Other examples of analytic truths are the logical and mathematical truths. The Conventionalists claim we are responsible for both the truth and the necessity of analytic truths. My critique of Conventionalism begins by considering necessary *a posteriori* truth, which poses a problem for Conventionalist accounts of the source of necessity. I show that Carnap can, in certain way, account for necessary *a posteriori* truth within his theory. My contribution to the vast literature on Conventionalism is to add a new objection based on considerations in the metaphysics of modality – the Incompleteness Objection. The general strategy in this chapter is to provide three principles that must be necessarily true in order for Carnap's account of linguistic framework choice to work whose necessity cannot be accounted for using conventions. Lastly, I recount W.V.O. Quine's very influential objections to Conventionalism.

I.3.2 Chapter 2: Necessity by Convention: A Critique of the Neo-convnetionalist's Account of the Source of Necessity.

In the second chapter I critique Ross Cameron's dependent account of the source of necessity, Neo-conventionalism. Unlike the Conventionalist who claims we are responsible for *both* the truth and the necessity of necessary truths, Neo-conventionalists claim that we are responsible only for the necessity of necessary truths. According to the Neo-conventionalist, there is a non-natural distinction between the abstract possible worlds and the abstract impossible worlds that is mind-independent. By 'non-natural distinction', the Neo-conventionalist is claiming that there is no single, natural division between the possible worlds and the impossible worlds that we are tracking. Rather, there are many ways that the abstract worlds are divided up and we latch onto one of those division based on our interests. By 'mind-independent', the Neo-conventionalist means that we do not divide up the worlds ourselves; rather, we latch onto one of the divisions already present amongst the abstract worlds based on our interests. The necessary truths, then, are necessarily true because they are true at every abstract possible world and those abstract worlds are the possible worlds insofar as we, in essence, chose that division of abstract worlds based on our interests. I raise two objections to the Neo-conventionalist account of the source of necessity. The first objection, the Incompleteness Objection, shows that Neo-conventionalism is at best an incomplete account of the source of necessity. I consider the modal status of the proposition that there is no natural distinction between the possible worlds and the impossible worlds. I argue that this proposition *must* be true if Conventionalism is correct and we have no choice about its necessity. The second objection, The Stroud Objection, challenges the

notion of us deciding which truths are necessarily true by latching onto to some division of the abstract worlds.

I.3.3 Chapter 3: A Critique of the Humean Account of the Source of Necessity

In the third chapter I critically evaluate Ted Sider's dependent account of the source of necessity, Humeanism. Humeanism comes in three varieties – a conventionalist version, a subjectivist (projectivist) version, and a combination of the two. Conventionalist Humeanism differs from Neo-conventionalism to the extent that for the Conventionalist Humean, we first arbitrarily choose certain sorts of truths to be labeled as 'necessary' and then introduce abstract possible worlds in which all the truths that we labeled 'necessary' are true. I use modified versions of the Incompleteness Objection and the Stroud Objection to challenge the Conventionalist Humean's account of the source of necessity. For the Incompleteness Objection, I contend that the proposition that if there was a convention then we selected a candidate must be necessarily true if Conventionalist Humeanism is correct. I then argue the Conventionalist Humean cannot provide us with an account of the source of its necessity. For the Projectivist Humean, the choice of which truths are labeled necessary is not arbitrary – there is something about us that makes it so we label the logical and mathematical truths 'necessary'. Sider does not explain what it is about us that makes it so we label certain truths as 'necessary'. I provide two different account of what that could be. The first account is based on insights from the Stroud Argument – intelligibility. I show that there are problems with using intelligibility as the explanation for why we label certain truths as necessary. The second account is based on Ludwig Wittgenstein's 'form of life'. We label certain truths as 'necessary' because we are the creatures that we are – i.e. that is what we do. I argue

that this is the most promising Dependent Account of the source of necessity if we take as primitive the fact that the logical and mathematical truths are central to our conceptual lives. Lastly, I use the Incompleteness Objection to challenge the Combination Huemean Account. According to that account, some sorts of truths are necessary by convention and some sorts of truths are necessary by projection. I show that the Combination Humean cannot provide us with an account of the necessity of the proposition that there are certain truths that are labeled 'necessary' by convention and there are other truths that are labeled 'necessary' by projection, which I contend *must* be true if Combination Humeanism is correct.

I.3.4 Chapter 4: Global Modal Error

In the fourth chapter I raise a general objection to all Dependent Accounts of the source of necessity. I argue that all Dependent Accounts of the source of necessity are incompatible with the epistemic phenomenon of global modal error. By 'global modal error' I have exclusively in mind a modal error that we, as a collective, make. I begin by establishing global moral error as a genuine epistemic phenomenon. I then develop an argument that shows the various Dependent Accounts of the source of necessity are incompatible with the phenomenon of global modal error. Dependent Accounts of the source of necessity are incompatible with the phenomenon of global moral error insofar as they don't provide us with a basis for comparison, which, I argue is essential for explaining this kind of error. The reason why there is no basis of comparison within these Dependent Accounts of the source of necessity is that they collapse metaphysical modality into a subjective modality (something akin to epistemic modality). There's no

way that we can ever be mistaken about the modal status of any proposition since we determine the modal status of every proposition.

I.3.5 Chapter 5: A Critique of Nondependent Account of the Source of Necessity

In the fifth chapter I consider accounts of the source of the necessity that make necessary truths necessarily true that do not locate the source of the necessity in contingent beings – e.g. humans. These are the Nondependent Accounts of the source of necessity. The first Nondependent Account of the source of necessity that I consider is David Lewis' Modal Realism. For the Modal Realist, necessary truths are necessarily true because those truths are true at every concretely existing world. The source of the necessity of those truths, then, is located in the concretely existing world. There are many objections that have been raised against Modal Realism. There is, however, one objection that is important for the project of finding the source of the necessity that makes necessary truths necessarily true – Peter Hanks' objection that Modal Realism is not an account of the metaphysics of modality; rather, it is a semantic account of how to understand our modal terms. Hanks argues that using Modal Realism as account of the source of necessity raises the following question: Why are the truths that are true at all of the concretely existing worlds true at those worlds? To have an answer to SNQ, the Modal Realist would need to answer this question, and the prospects of answering that question are not promising. The second Dependent Account of the source of necessity that I consider in this chapter is Kit Fine's Essentialism. According to Fine, the source of necessary truths' necessities is located essences. Fine does not explain essences using modal terms (which is typically done); rather, he appeals to a notion of real definition, which for Fine is the collection of true propositions that correspond with the constitutive essential properties of

that object – where the constitutive essential properties of an object are the properties that make that object what it is. It is on the basis of constitutive essences that modalities arise. I raise two objections to Fine's Essentialist account of the source of necessity. I first argue that the foundation of the Essentialist account of the source of necessity is in fact based in an unintuitive, yet non-vicious, infinite hierarchy of higher-order essential properties. The more important objection that I raise is that Fine's Essentialism is an incomplete account of the source of the necessity that makes necessary truths necessarily true. Fine's Essentialism is incomplete due to his commitment to Actualism – the only objects that exist are the objects in the actual world. Fine is unable, then, to provide us with an account of modal properties of possible beings since they do not exist in the actual world, since they have no essential properties. I then explain that this is a problem for any account of the source of necessity that attempts to locate the source of necessity in the actual world. Any such account will be an incomplete account of the source of necessity.

I.3.6 Conclusion

In the conclusion I sum up what I have done in Chapter 1 through Chapter 5. I argue that my structural objections rule our Dependent Accounts of the source or necessity. I then explain why I think that the prospects for developing a cogent Nondependent Account of the source of necessity are not very good. Lastly, I provide some thoughts on accepting Primitivism and briefly describe some future research projects based on my findings in this dissertation.

Chapter 1: Truth and Necessity by Convention: A Critique of the Conventionalist's Account of the Source of Necessity

1.0 Introduction

The first dependent account of the source of necessity that we will evaluate is the Conventionalists' account. I will give a brief overview of the Conventionalists' account of the source of necessity in this introduction (I will provide a more robust account in section 1). Before considering their account of the source of necessity, though, we must first discuss which class of truths the Conventionalists consider apt for being necessarily true. For the Conventionalists, all truths (and falsehoods) can be separated into two broad classes – the class of analytic statements and the class of synthetic statements. The simple, but sufficient, distinction between analytic truths and synthetic truths that we will utilizes is:

> Analytic Statements: Analytic statements are true (tautologies) or false (contradictions) via the meanings of their linguistic constituents alone, which are determined by convention.
>
> Synthetic Statements: The truth or falsity of synthetic statements is not grounded in the meanings of their linguistic constituents alone.

The hackneyed example of an analytic truth is the sentence "All bachelors are single males". According to the Conventionalists, the truth of this sentence is based solely on the sentence's linguistic constituents – 'bachelor' and 'single male'. We have stipulated, by convention, that these two terms are synonymous; hence, we have determined by convention that the sentence "all bachelors are single males" is both true and necessary (there could never be a bachelor that is not a single male). Other examples of truths that are supposedly analytic are "2 + 3 = 5", "all equilateral triangles are equiangular", "either

it's raining or it's not raining". An example of a synthetic truth is "Justin is a bachelor". The truth of this sentence is not solely based on the sentence's linguistic constituents – 'is a bachelor' is not part of the meaning of 'Justin'. The only way to determine whether or not that sentence is true is by understanding its linguistic constituents and, importantly, experience – e.g. not finding evidence that Justin is in fact married. Synthetic truths are not true by convention nor are they necessary (all of this will be explained in more detail in what follows).

For the Conventionalists (e.g. the Logical Positivists), then, the only truths that are necessarily true are the analytic truths. This is clearly evident in A.J. Ayer's discussion of necessity in his book *Language, Truth, and Logic, 2nd ed.* During his refutation of Kant's theory of geometry and arithmetic (Kant claims such truths are synthetic *a priori* truths that are necessary), Ayer explains, "for while it is true that we have *a priori* knowledge of necessary propositions, it is not true, as Kant supposed, that any of these necessary propositions are synthetic. They are without exception analytic propositions, or, in other words, tautologies" (Ayer, 1952, p. 47). Clearly, then, for Ayer the only necessary truths are the analytic truths. This holds for the other Conventionalists too – in what follows we will examine in some detail Rudolf Carnap's development of the Conventionalist theory and Alan Sidelle's work on *a posteriori* necessary truth. If the only truths that are necessarily true are the analytic truths and analytic truths are true by convention, then the source of the necessity that makes necessary truths necessarily true is us – the individuals making the conventions.

I begin this chapter by presenting Carnap's version of Conventionalism in some detail. I am focusing on Carnap's construal of Conventionalism for two reasons. First, it

is one of the most developed theories of Conventionalism, and, secondly, it is the most popular in contemporary philosophical debates (see especially modern deflationist accounts of truth and reference). I then consider whether the question, "What is the source of the necessity that makes necessary truths necessarily true?" (i.e. SNQ), is an external question (one posed outside of a linguistic framework) that is meaningless and cannot be answered, or an internal question (one posed within a linguistic framework) that is meaningful and can easily be answered. I will argue that there is a way for the Conventionalist to answer SNQ even though it initially seems like SNQ is an external question. Next, I will consider a possible challenge to the Conventionalist's account of necessary truths via necessary *a posteriori* truth (e.g. the truth expressed in the sentence "water is H_2O") and present Sidelle's response to that challenge, which involves accommodating those truths within the theory of Conventionalism. I will then raise an objection to Sidelle's account that will lead to a discussion of Carnap's pragmatic account of how linguistic frameworks are chosen. I will argue that there are certain necessary truths associated with the pragmatic aspect of choosing a linguistic framework to capture our factual knowledge of the world and that the source of the necessity of those necessary truths cannot be conventions. Lastly, I will recount Willard Van Orman Quine's influential objection to Conventionalism in his article "Truth by Convention".

1.1 Carnap's Conventionalism

Our primary concern in this section is to understand in greater detail the Conventionalist's answer to the Source of Necessity Question (SNQ) – What is the source of the necessity that makes necessary truths necessarily true? As discussed in the Introduction to this chapter, the Conventionalists' answer to SNQ is that the necessary

truths are necessarily true because they are analytic truths whose truth and necessity depend on our conventions. In this section I will flesh out this idea using the influential work of Carnap.

To begin, we need to discuss the status of SNQ itself. A common theme running throughout many of Carnap's most influential works is his continual opposition to metaphysics. Carnap, in his article "Empiricism, Semantics, and Ontology," which appears in the Supplement of *Meaning and Necessity: A Study in Semantics and Modal Logic*, expresses one of his most emphatic opposition to metaphysics. The main purpose of this article is to justify the use of abstract objects such as numbers, proposition, properties, etc., by Empiricists who are uncomfortable accepting such objects into their ontologies (Carnap, 1956a, p. 206). Carnap's justification of the use of such objects by Empiricists is based on a careful analysis of language and questions concerning existence. He begins by introducing linguistic frameworks. According to Carnap, "if someone wishes to speak in his language about a new kind of entities, he has to introduce a system of new ways of speaking, subject to new rules; we shall call this procedure the construction of a linguistic *framework* for the new entities in question" (Carnap, 1956a, p. 206). Linguistic frameworks, then, are systems of rules that we use to introduce and govern our use of new expressions that we introduce into our language.

Carnap explains later that there are two essential steps for the acceptance of a new kind of entity – i.e. the construction of a linguistic framework. Carnap explains:

> First, the introduction of a general term, a predicate of higher level, for the new kind of entities, permitting us to say of any particular entity that it belongs to this kind (e.g., "Red is a *property*", "Five is a *number*"). Second, the introduction of variable of the new type. The new entities are values of these variables; the constants (and the closed compound expressions, if any) are substitutable for the variables. (Carnap, 1956a, pp. 206-7)

For example, if we wish to talk about propositions, we must introduce a predicate – 'proposition' – into our language and variables for propositions. We then formulate rules that govern the use of that predicate and those variables. Importantly, the introduction of a new linguistic framework does not entail that those objects being introduced exist in reality. According to Carnap, "… the introduction of the new ways of speaking does not need any theoretical justification because it does not imply any assertion of reality" (Carnap, 1956a, p. 214). A theoretical justification of the introduction of new ways of speaking would involve justifying the use of a new linguistic framework by arguing or showing that the entities within that framework exist in reality. For Carnap, the adoption of these entities into our language via a linguistic framework does not commit us to the existence (or nonexistence) of those entities in reality; rather, it is nothing more than the adoption of new linguistic forms into our language. He acknowledges that there is a question about deciding which of the linguist frameworks that we will (or should) adopt, but this is a practical question as opposed to a theoretical question (more on this later).

After introducing linguistic frameworks, Carnap goes on to draw a distinction between two different kinds of questions about existence – internal questions and external questions. Internal questions are questions of the existence of abstract objects posed within a linguistic framework. Carnap explains, "internal questions and possible answers to them are formulated with the help of the new forms of expressions. The answers may be found either by purely logical methods or by empirical methods, depending upon whether the framework is a logical one or a factual one" (Carnap, 1956a, p. 206). Within the linguistic framework we can answer questions about the existence of the entities that are in the domain of that linguistic framework. Let's consider the question "Do

propositions exist?" If this is an internal question, the answer is quite simple – "yes". According to Carnap, once we adopt the linguistic framework of propositions, the statement "propositions exists" is analytic (Carnap, 1956a, p. 210).

External questions, on the other hand, are questions that are not posed within a linguistic framework. They are questions about the existence of the total system of entities (Carnap, 1956, p. 214). For example, an external question about propositions is about the existence of propositions in reality – i.e. the existence of these entities independent of any linguistic framework. Now, Carnap considers such external question to be "pseudo questions" that in principle cannot be answered. They are pseudo questions insofar as they are grammatically well formed (i.e. they look grammatically like any other question); however, they are questions that don't have any cognitive content and thereby cannot be answered. The reason why external questions do not have any cognitive content and cannot be answered, Carnap contends, is that they are posed outside of a linguistic framework. Carnap, in "The Elimination of Metaphysics Through Logical Analysis of Language," which precedes "Empiricism, Semantics, and Ontology," explains:

> Since metaphysics does not want to assert analytic propositions, nor to fall within the domain of empirical science, it is compelled to employ words for which no criteria of application are specified and which are therefore devoid of sense, or else to combine meaningful words in such a way that neither an analytic (or contradictory) statement nor an empirical statement is produced. (Carnap, 2005, p. 987)

If external questions are posed outside a linguistic framework, then neither logical methods nor empirical methods can be used to make sense of or answer those external questions – there is "no criteria for application." This is clearly a product of Carnap's commitment to Verificationism. To ask, "Do propositions exist?" outside of a linguistic

framework of propositions is nonsensical. Outside of a linguistic framework of propositions there are no criteria of application for 'propositions' and 'exist'. The only way for such a question to make sense is if it is posed within a linguistic framework.

What is the status of SNQ? Is it an internal question or an external question? SNQ initially appears to be an external question asking about the *reality* of the source of the necessity that makes necessary truths necessarily true. If SNQ were an external question, then we wouldn't be able to use the tools of a linguistic framework to properly formulate or answer SNQ. If that were the case, then Carnap would claim that SNQ is a pseudo question – i.e. meaningless. In other words, Carnap's response to the project being undertaken in this dissertation would be that it is pointless since the question that I am trying to answer is meaningless and I do not have the necessary tools to answer it (i.e. a linguistic framework). So, it's paramount to show that we actually do have the means within Carnap's own theory to answer SNQ. Despite SNQ appearing to be an external question, I do believe that we can answer it by formulating and answering another related internal question.

Within our language, we will have undoubtedly adopted some linguistic framework of logic and some linguistic framework of mathematics. Let's now consider the internal question "Do necessary truths exist?" To answer this question, we must understand Carnap's conception of necessary truths. In *Meaning and Necessity*, Carnap develops a semantics for modal logic. The truth condition for necessary truths are: "For any sentence '…', 'N(…)' is true if and only if '…' is L-true" (Carnap, 1956b, p. 174). In this passage, 'N' is serving as the necessity operator. Our next task is to understand what Carnap means by 'L-true'. For Carnap, L-truth is used to explain the concepts of

'logical truth', 'necessary truth', and 'analytic truth'. In order to use L-truth to explain these concepts, Carnap contends that L-truth must meet the "Convention Condition". According to Carnap, the Convention Condition is: "a sentence $\mathfrak{S}_i$ is L-true in a semantical system *S* if and only if $\mathfrak{S}_i$ is true in *S* in such a way that its truth can be established on the basis of the semantical rules of the system *S* alone, without any reference to (extra-linguistic) facts" (Carnap, 1956b, p. 10). He goes on to explain that a sentence will be L-true if and only if it is true in every state description. From all of this we can create a linguistic framework for the term 'necessary' – a necessity linguistic framework. The necessity linguistic framework will have a criterion for when it is permissible to apply the term 'necessity' to a sentence – namely:

> **Necessity Criterion:** 'necessity' can be applied to a sentence *S* if and only if sentence *S*'s truth is established on the basis of the semantic rules of the linguistic framework *L* alone, without appealing to any extra-linguistic facts.

Now, when we introduce some linguistic framework of logic or some linguistic framework of mathematics into our language we will have undoubtedly established rules for those linguistic frameworks. Since the necessary truths of logic and mathematics are necessarily true in their respective linguistic frameworks, they are L-true in their respective linguistic frameworks. If the truths of logic and mathematics are L-true in their respective frameworks, then they meet the Convention Condition – their truth is determined by the semantical rules established when we adopted the linguistic framework, which will make those truths true in every state description. Hence, the truths of logic and mathematics meet the Necessity Criterion. For example, suppose that we have adopted the classical logic linguistic framework. The sentence "either it's raining or it's not raining" is true via the Law of Excluded Middle, which is part of the

rules that we established when adopting the classical logic linguistic framework. Since every sentence is either true or false, but not both, in the classical logic linguistic framework (which means that every sentence is either true or false, but not both, in every state description), disjunctions composed out of a sentence and its negation will be true in every state description – i.e. necessarily true. Note that we did not appeal to any extra-linguistic facts (e.g. looking out the window) to establish the truth of this sentence in any state description, which is in accordance with Necessity Criterion. It is fairly evident, then, that the answer to the question of whether necessary truths exist is "yes".

It's important to note that necessary truths don't appear only in logical and mathematical frameworks. To see why this is the case, consider again the sentence "all bachelors are single males". For this sentence to meaningful (i.e. not a pseudo sentence), it must be the case that there is a linguistic framework that it is a part of – let's call that linguistic framework "the marital status linguistic framework". When we first introduced the marital status linguistic framework, we introduced rules for the terms that occur in that linguistic framework.[13] One of the rules that we adopted is that the term 'bachelor' is synonymous with 'single male'. Since "all bachelors are single males" is true via the semantical rules of the marital status linguistic framework, the sentence is L-true and the sentence meets Carnap's Convention Condition – importantly, we do not need any extra-linguistic facts to determine its truth (e.g. checking to make sure every bachelor in the

[13] Carnap, in his article "Meaning Postulates" that is appended to *Meaning and Necessity: A Study in Semantics and Modal Logic*, calls these types of rules "meaning postulates." Carnap explains, "Suppose that the author of a system wishes the predicates 'B' and 'M' to designate the properties Bachelor and Married, respectively. How does he know that these properties are incompatible and that therefore he has to lay down [the] postulate [for all *x*, if *x* is a bachelor, then *x* is not married]? This is not a matter of knowledge but of decision" (Carnap, 1956c, pp. 224-5). In what follows I will continue to talk about the axioms and the rules for linguistic frameworks with the intention that 'rules for linguistic frameworks' can, and does, signify meaning postulates.

world is in fact a single male), so the sentence meets the Necessity Criterion. Since we have adopted the marital status linguistic framework, that sentence will be true in every state description – i.e. necessarily true. So once again we can answer the question of whether necessary truths exist in the affirmative using the marital status linguistic framework.

So far we have established that the answer to the internal question of whether necessary truths exist is "yes". Before we can fully answer SNQ using our answer to that question, we must first discuss one more aspect of Carnap's system – the process of linguistic framework selection. It is tempting to think that there must be some theoretical justification (account) for adopting a linguistic framework. The thought is that we must first establish that propositions, bachelors, etc., exist before we adopt 'proposition', 'bachelor', etc., into our language. Carnap explicitly denies such a process. To establish that propositions, bachelors, etc., exist, we must first pose the questions: "Do propositions exist?", "Do bachelors exist?", etc. These questions are external questions to the extent that we have not adopted linguistic frameworks to pose them. Hence, they are pseudo questions that cannot be answered (they cannot be answered because we don't have the linguistic tools necessary to answer them). So there is no theoretical account (which requires a linguistic framework) of our adoption of certain linguistic frameworks. Nevertheless, Carnap acknowledges that there must be some process for adopting a linguistic framework. Carnap explains:

> To be sure, we have to face at this point an important question; but it is a practical, not a theoretical question; it is the question of whether or not to accept the new linguistic forms. The acceptance cannot be judged as being either true or false because it is not an assertion. It can only be judged as being more or less expedient, fruitful, conducive to the aim for which the language is intended. (Carnap, 1956a, p. 214).

The adoption of a linguistic framework is therefore based on our practical concerns. If the classical logic linguistic framework is "expedient, fruitful, conducive to the aim" for which it is intended, then we adopt that framework.

We are now in a position to formulate an answer to SNQ that is in accordance with Carnap's version of Conventionalism. Necessary truths are L-true because of the semantical rules that we have set down when adopting a linguistic framework. Since those truths are L-true and are compliant with the Convention Condition, they are true in every state description (i.e. necessarily true). Now, we decide which linguistic frameworks to adopt based on our practical considerations; hence, we decide which truths are necessarily true via our selection of linguistic frameworks. For example, suppose that we have adopted the classical logic linguistic framework. Then all of the logical truths of classical logic are necessarily true. For example, all disjunctions that have a sentence and its negation as their disjuncts will be necessarily true via the Law of Excluded Middle. Now, we could have adopted the intuitionist logic linguistic framework instead of the classical logic linguistic framework. If that were the case, then it would not be the case that all disjunctions that have a sentence and its negation as their disjuncts would be necessarily true (the Law of Excluded Middle is not a logical law of intuitionist logic) or even true for that matter. So, we would have a different set of necessary truths if we were to adopt the intuitionists logic linguistic framework. Therefore, the Conventionalist's answer to SNQ is that we are the source of the necessity that makes necessary truths necessarily true insofar as we are the ones choosing which linguistic frameworks to adopt based on our practical concerns.

1.2 Necessary *A Posteriori* Truths

One of the tenets of Conventionalism is that all necessary truths are analytic. If all necessary truths are analytic, then they are all known *a priori*. Why? All analytic truths are true by convention, so it is not necessary to conduct an empirical investigation to determine whether they are in fact necessarily true. For example, to determine whether the analytic sentence "all bachelors are single males" is necessarily true, all we need to do is to consult the rules of the linguistic framework that we have adopted (in this case the marital status linguistic framework). Once we consult the rules for that linguistic framework it will become evident that the term 'bachelor' is synonymous with 'single male', so that sentence is necessarily true by convention. Note that our knowledge of the truth of that analytic sentence is not reliant on experience (i.e. an empirical investigation); hence, that truth is known to be true *a priori* (I'll discuss another way of understanding the Conventionalists' commitment to all necessary truths being analytic and *a priori* shortly). Now, Hilary Putnam, in "The Meaning of 'Meaning'," and Saul Kripke, in *Naming and Necessity*, have both argued for the existence of necessary truths that are known *a posteriori*. If such truths exist, that is problematic for the Conventionalist. In this section I will present Putnam's and Kripke's arguments for necessary *a posteriori* truths, explain in detail the problem they pose for Conventionalism, and examine and critique Sidelle's Conventionalist solution. The upshot of this section will be that the Conventionalists (in particular, Carnap) can account for necessary *a posteriori* truths using their own theory without the extra theoretical component that Sidelle introduces. One of the objections that I will present in Section 3 will be based on the Carnapian account of necessary *a posteriori* truths.

1.2.1 The Case for Necessary *A Posteriori* Truths and the Problem They Pose for Conventionalism

Necessary *a posteriori* truths are truths that are true in every possible world and are known to be true through experience (e.g. empirical investigation). The examples of necessary *a posteriori* truth that are typically discussed have to do with either essential properties of natural kinds (e.g. diamonds are composed of carbon) or essential properties of humans (i.e. the necessity of origin – e.g. Saul Krpike is necessarily the product of the fertilization of a certain egg of Dorthy Kripke's by a sperm from Myer Kripke). The hackneyed example of a necessary *a posteriori* truth (of the natural kind variety) is expressed in the sentence "water is H_2O." It is fairly easy to see why that truth is known to be true *a posteriori*. We used the term 'water' well before we discovered that water has the particular atomic structure that it has. Kripke explains, "we identified water originally by its characteristic feel, appearance and perhaps taste, (though the taste may usually be due to the impurities" (Kripke, 1980, p. 128). At some point in time, scientists developed the hypothesis that forms of matter have atomic structures. The scientists then devised experiments to test their hypothesis. It turned out that their hypothesis was correct – forms of matter do have atomic structures. In the case of water, they discovered that water has two hydrogen atoms and one oxygen atom – its chemical formula is H_2O. Hence, the truth expressed in the sentence "water is H_2O" is known to be true *a posteriori*. It took an empirical investigation to determine that that sentence is in fact true.

Why is the truth expressed in the sentence "water is H_2O" necessarily true? Kripke and Putnam both contend that the reason why that truth is necessarily true is due

to the fact that having that particular atomic structure (two hydrogen atoms and one oxygen atom) is an essential property of water. An essential property *p* of some substance *x* is a property that substance *x* must have in order to be substance *x*. If some substance lacks property *p*, then that substance is not substance *x*. According to Kripke, "if there were a substance, even actually, which had a completely different atomic structure from that of water, but resembled water in these respects [characteristic feel, appearance, taste], would we say that some water wasn't H_2O? I think not" (Kripke, 1980, p. 128). We can use a thought experiment that Putnam devised to fortify the claim that having that particular atomic structure is an essential property of water. Suppose that there is a possible world w* in which everything is similar to actual world ("$w^{@}$") with one exception: in w*, the term 'water' in the language of w* is used to denote a clear liquid that has the chemical formula XYZ. The inhabitants of w* use XYZ in exactly the same way that we use H_2O in $w^{@}$ – e.g. they drink it, they swim in it, they shower in it, etc. (Putnam, 1975, p. 140). Is the term 'water' in the language of w* synonymous with the term 'water' used in the language of $w^{@}$? The answer is no. According to Putnam, "once we have discovered that water (in the actual world) is H_2O, *nothing counts as a possible world in which water isn't H_2O*" (Putnam, 1975, pp. 150-151).[14] Even though the inhabitants of w* use some term that sounds or looks identical to our term 'water' in the actual world, that term is not synonymous with our term 'water' in $w^{@}$ insofar as the

[14] The claim that it is impossible for 'water' to refer to any other substance than H_2O is often called into question. It seems to be a contingent fact that water has the atomic structure that it has. There are many ways to deal with the conflicting intuitions. Some chose to explain how both of these intuitions are correct (most notably two-dimensionalist semanticists). Others argue that one of the intuitions is incorrect. This is Putnam's tactic. According to Putnam, "on the other had we could perfectly imagine having experiences that would convince us (and make it rational to believe that) water isn't H_2O. In that sense, it is conceivable that water isn't H_2O. It is conceivable but it isn't logically possible! Conceivability is no proof of logical possibility" (Putnam, 1975, p. 151).

substance XYZ (the referent of the term 'water' in the w* language) is not identical to the substance H_2O (the referent of the term 'water' in the $w^@$ language). Hence, water is H_2O in all possible worlds and the sentence "water is H_2O" expresses a necessary truth.

The existence of necessary *a posteriori* truths appears to conflict with the Conventionalists' account of necessary truths. There are two reasons why this is the case. First, recall that the only truths that are necessarily true for the Conventionalists are analytic truths. For the Conventionalists, analytic truths are known to be true *a priori*. Why is that the case? Suppose that some analytic truth was not known to be true *a priori*. If that analytic truth is not known to be true *a priori*, then it is known to be true *a posteriori*. If that analytic truth is known to be true *a posteriori*, then its truth is not based on the meaning of its linguistic constituents alone insofar as we know *a posteriori* truths are true via empirical investigations (i.e. experience). If that analytic truth's truth is not based on the meaning of its linguistic constituents alone, then it is not an analytic truth (via the definition of analytic truth given above). So that analytic truth is not an analytic truth. Contradiction! Hence, all analytic truths are known to be true *a priori*. Therefore, all necessary truths are known to be true *a priori*. If this is the case, then there can be no necessary *a posteriori* truths.

Second, it is typically thought that natural kinds are mind-independent groupings in nature – i.e. they are not groupings that are dependent on our conceptual schemes. When we talk about the essential features of natural kinds, we are talking about the essential features of those substances in nature. Carnap, in his book *The Logical Structure of the World*, warns against talking about essential relations within our

scientific theories.[15] Carnap explains, "an essential relation cannot be given a place in the constructional system [i.e. scientific linguistic framework]. Thus, statements about such relations cannot be brought into a verifiable form. Thus, science cannot ask questions concerning essential relations. Hence, this concept is shown to belong to metaphysics" (Carnap, 1967, p. 257). Recall that for Carnap and the Conventionalists, the questions, theoretical statements, and sentences in metaphysics are posed outside of a linguistic framework and are therefore meaningless. Since we cannot talk about the essential feature of natural kinds, posing any theory of the essential natures of natural kinds seems to be a nonstarter for the Conventionalist.

1.2.2 Sidelle's Conventionalist Account of Necessary *A Posteriori* Truths

Sidelle's general strategy for incorporating necessary *a posteriori* truths into Conventionalism is simple and straightforward (although the details quickly become involved and complex). The general strategy is to divide and conquer. According to Sidelle, there are two components to necessary *a posteriori* truths. There is the necessity component, which in the case of natural kinds is typically thought to be associated with some modal structure in reality (e.g. the essential natures of those kinds), and there is the *a posteriori* component, which is how we know those truths are true (e.g. we know that the sentence "water is H_2O" is true via our scientific investigations). The simple idea behind Sidelle's Conventionalist account of necessary *a posteriori* truths is to argue that the necessity components of those truths are actually general linguistic principles that are analytic, which are based on conventions, and that the epistemic components (i.e. the a

[15] By 'essential relation', Carnap means "…that which connects the members of a relation 'essentially' or 'really' or 'actually', in contradistinction to the relation as a mere correlation which only points out the members are so correlated" (Carnap, 1967, p. 35).

posteriori components) are contingent and serve to 'fill in the details' of the general principles via empirical investigations (Sidelle, 1989, pp. 35-41). In what follows, I will present the pertinent details of Sidelle's Conventionalist account of necessary *a posteriori* truths. I will raise some objections to his account in the following subsection.

Sidelle begins by motivating the division of necessary *a posteriori* truths into a necessity component and contingent epistemic component. He has us consider the *epistemic possibility* of us discovering that some a posteriori truth that we *thought* was necessarily true is actually false. He explains that if it is *epistemically impossible* for that to happen, then that truth is not known to be true *a posteriori*; rather, it is known to be true *a priori*. Sidelle has us consider the following thought experiment.[16] Suppose that our scientists announced one day that they made a mistake when they were originally figuring out the atomic structure of water – this must be an *epistemically possible* scenario if the truth expressed by the sentence "water is H_2O" is known to be true in the actual world *a posteriori*. In this scenario, it is discovered that water is actually composed out of one X molecule, one Y molecule, and one Z molecule – its chemical composition is XYZ. If this were the case, then the essential feature of water in the actual world $w^{@}$ would be that water is composed out of XYZ. Once we have established that, we can then consider a metaphysical possible world w* in this *epistemically possible* scenario that has some liquid substance which is used in the same way that we use XYZ (we can even suppose, as Putnam did, that the inhabitants of that world have the term

[16] Sidelle also has us consider a thought experiment that has to do with the necessity of origin. It is epistemically possible that Saul Kripke's actual father was Albert Kripke (Myer Kripke's brother). Suppose that were the case. If that were the case, then Saul Kripke is necessarily the product of one particular egg of Dorothy Kripke's being fertilized by one of Albert Kripke's sperm. Then the sentence "Saul Kripke's is the product of Dorothy Kripke and Albert Kripke" would be necessarily a posteriori true.

'water' in their language), but has a different atomic structure (say H_2O). It is clear that w* does not have any water in it – the substance in that world is H_2O. Hence, the sentence "water is H_2O" actually expresses a falsehood and the sentence "water is XYZ" expresses a necessary *a posteriori* truth in this epistemically possible scenario (Sidelle, 1989, pp. 30-2). According to Sidelle, what this thought experiment shows is that "what is claimed to be a necessary *a posteriori* attribute is so because it is the actual value of a parameter that is such that whatever takes the value is necessary, and in each case, there seems to be no barriers to a variety of epistemically possible such values" (Sidelle, 1989, p. 32). In other words, there is a necessity component – a parameter – to necessary *a posteriori* truths and there are a number of epistemically possible values that it can take, which is the contingent component of necessary *a posteriori* truths. Sidelle calls the necessity generating parameters "general principles of individuation" (Sidelle, 1989, p. 34). In the thought experiment, the necessity component is the general principle of individuation for chemical kinds that loosely states if water is a chemical kind, whatever is water's actual atomic structure (it's individuation property), water necessarily has that atomic structure (Sidelle, 1989, p.44). The epistemic component is made up of the values that can be used to fill in the details of that general principle of individuation, which are discovered through empirical investigation. In the thought experiment, the epistemic component that fills in the details of the general principle of individuation for chemical kinds as it pertains to water is the empirical discovery that water is composed of XYZ.

The necessity component (i.e. the parameters of individuation) of necessary *a posteriori* truths – the general principles of individuation – have typically been thought to be determined by the essential features of the objects/things/kinds in reality. This is

evident in the natural kinds distinction championed by Putnam and Kripke that was discussed above. The thought is that there is some essential property of the kind (or individual) that exists in reality and that we have discovered (or are trying to discover) that property through empirical investigations. What is innovative in Sidelle's account is his Conventionalist theory of the general principles of individuation of necessary *a posteriori* truths. According to Sidelle, "suppose that the general principles of individuation are analytic. That is, suppose that rather than being general claims that describe features of a mind-independent modal structure of reality, these principles are instead object-level formulations of conventions we have adopted concerning how we will describe things, particularly when we are speaking of nonfactual, or hypothetical cases" (Sidelle, 1989, pp. 35-6). It is then a convention that chemical kinds have their atomic structures necessarily. To be clear, it's not a convention that they have their atomic structures; only that they have their atomic structures *necessarily*.

I think that Sidelle's claim here becomes clear when we consider it in light of Carnap's linguistic frameworks. When we introduce a linguistic framework for chemical kinds, we will introduce rules and a particular general principle or scheme of individuation that holds necessarily insofar as that general principle or scheme of individuation is analytic. That general principle or scheme of individuation is analytic due to the fact that it is based on a convention. Sidelle provides us with the following general scheme for chemical kinds:

> If 'x' denotes something of kind K, then if p is the P-property of the thing denoted by 'x', then 'x' applies to something in any possible situation only if it is (has) p. (Sidelle, 1989, pp. 43-4).

The P-property is the property used for individuation – origin, atomic structure, etc. – that was determined by convention. We fill in the details of this general scheme via empirical investigation. For example, scientists first introduced the linguistic framework for chemical kinds, which involved introducing the principle of individuation for chemical kinds. Our scientists then discovered through empirical investigations that water is composed of two hydrogen atoms and one oxygen atom. According to the general scheme, if 'water' denotes a chemical kind, then if H_2O is atomic structure of the liquid denoted by 'water', then 'water' applies to something in any possible situation only if it is composed of H_2O. Hence, our term 'water' necessarily refers to the substance with the chemical formula H_2O.

One immediate concern that Sidelle addresses is that there appears to be an underlying essential feature of chemical kinds that he is relying on – that they necessarily have atomic structures that they have. If our term 'water' applies to something in any possible situation only if it is composed of H_2O, then water has the atomic structure that it has necessarily. The necessity of water's atomic structure is not dependent on our conventions. If this were the case, then the Conventionalist analytic general principle of individuation would be vacuous (i.e. not doing any work) (Sidelle, 1989, p. 45). Sidelle's response is that this concern is based on a misunderstanding of the Conventionalist's position. According to Sidelle, "it is not that … 'water' or 'chemical kind' is to apply only to items that have their microstructures essentially, but, rather, that such terms are determined to have some actual application, and we then cannot count anything, in any possible situation, as relevant kind if it does not have the same microstructure (instances of) this application" (Sidelle, 1989, pp. 46-7). He goes on to explain that it is through our

intentions to use certain terms, e.g. ‘chemical kind’ or ‘water’, in a certain way that those terms have the modal import that they do. The intention behind using ‘chemical kind’ is to highlight certain properties, e.g. atomic structures such as H_2O, that enough of the actual substances have that can be used to individuate those substances in the actual world. We then use those properties to govern our use of chemical kind terms, e.g. terms like ‘water’, in our counterfactual reasoning. The intention behind using ‘water’, then, is to denote a certain similarity of atomic structure between enough of the things that we call ‘water’ in the actual world. Given our rules for the application of the term ‘water’, nothing will count as water in a counterfactual situation that does not have the atomic structure that enough of the things we call ‘water’ share (Sidelle, 1989, p. 49).

1.2.3 An Objection to Sidelle’s Conventionalist Account of Necessary *A Posteriori* Truths

In this subsection I am going to raise an objection to Sidelle’s Conventionalist account of necessary *a posteriori* truths. I will begin by considering an example of a type of necessary *a posteriori* truth – one with a mathematical component – whose necessity is not convincingly accounted for in Sidelle’s Conventionalist account of such truths. I will then argue that the source of the necessity of that necessary *a posteriori* truth is a necessary *a priori* truth of classical mathematics. Next, I apply the lessons learned in my consideration of the necessary *a posteriori* truth with a mathematical component to other types of necessary *a posteriori* truths, such as the necessary *a posteriori* truth expressed in the sentence “water is H_2O.” I will argue that Sidelle’s chemical kinds individuation principle is not the source of the necessity expressed in that sentence. This will lead us to a general objection to Conventionalism in the next section.

As explained above, Sidelle's Conventionalist treatment of necessary *a posteriori* truths involves dividing those truths into a necessity component (i.e. some general principle of individuation) and a contingent epistemological component (i.e. the empirical discoveries that 'fill in the details' of the general principle of individuation). The necessity of those truths is rooted in their general principles of individuation, which are analytic. Since these general principles of individuation are analytic, the necessity of necessary a posteriori truths is therefore dependent on (or rooted in) our conventions. So, when we say that the truth expressed in the sentence "water is H_2O" is necessary, we are saying that we have decided that truths about chemical kinds (more specifically, their atomic structures) are necessary. There is no property that water has that is the basis of the necessity of the truth expressed in the sentence "water is H_2O."[17]

[17] Why think that this is the case? Sidelle's main argument for thinking that this is the case is that there is no basis for supposing that we have epistemic access to any modal features of reality. According to Sidelle:

> The intuition here is that if necessity were a real feature of the world, a real necessary truth would rule out some state of affairs, considered nonverbally. The fact that we need a description to explain what is ruled out shows that the necessity has a linguistic, and not a metaphysical, source. Thus, the consideration of necessary truths does not overturn the suspicion that there is no real necessity, but in fact supports it and the corresponding claim that necessity has its source in conventions. (Sidelle, 1989, p. 118).

In order for the necessity of the truth expressed in the sentence "water is H_2O" to have its source in reality, then, it must rule out certain states of affairs as possible nonverbally. However, in order to rule out these states of affairs, we need to be able to talk about these states of affairs and that shows, according to Sidelle, that the necessity of the sentence "water is H_2O" is based on our conventions.

One way to challenge this argument that is worth mentioning is to claim that the fact that we need a description to explain what states of affairs are ruled out does not show that there is no metaphysical source of necessity. What is important is that those states of affairs are not being ruled out because of some convention that we have adopted. The way that we have access to the world is through our theories and language. We come up with a theory about how the world is, and then we test it by observing how the world actual is. Our theories give us epistemic modalities and we test those against the metaphysical modalities of reality. So it is possible for some epistemic necessity to be ruled out by some metaphysical necessity. This would be the case for the natural kinds theorist. Suppose that we discovered that the atomic structure of water was not the essential feature of water via some discovery of varying subatomic structures. If that were the case, then the class of natural kinds considered as essential features of substance would be ruled out by a modal feature of reality (i.e. the possibility of water have different subatomic structures).

Let's now consider a necessary *a posteriori* truth whose necessity does not appear to be rooted in some special convention like Sidelle's general principle of individuation. Consider the following event in the history of mathematics: It was widely thought in the mathematical community that Alfred Kempe had proven the Four-color Theorem in 1879.

> **Four-color Theorem:** Any map on a plane or the surface of a sphere can be colored in such a way that only four different colors are required to make it that no two countries that share a boundary will have the same color.

In 1890, however, Percy Heawood found a flaw in Kempe's 1879 putative proof of the Four-color Theorem (Spika, 2002, pp. 21-23, 26). Now, let's consider the modal and epistemic status of the truth expressed in the following sentence:

> **Kempe Sentence:** "Kempe did not prove the Four-color Theorem with his actual 1879 proof."[18]

The truth expressed in that sentence is necessary – there is no possible world where Kempe used his actual 1879 proof to prove the Four-color Theorem insofar as there is no possible world where that proof proves the Four-color Theorem.

How do we know that the truth expressed in the Kempe Sentence is true? Is that truth known *a priori*? If it's known *a priori*, then it is known independent of experience and empirical investigation. On the face of it, the Kempe Sentence appears to be true *a priori*. After all, no one who uses Kempe's actual 1879 proof has proved the Four-color Theorem. In other words, we don't need to do an empirical investigation to discover who tried to use Kempe's actual 1879 proof to try to prove the Four-color Theorem to know that they failed, which means we do not need to do an empirical investigation to know

[18] I am going to use 'proof' to denote the argument that Kempe presented in 1879, which is somewhat typical in the history of mathematics, even though 'proof' has the connotation of success.

that the Kempe Sentence is true. Ergo, it's known to be true *a priori*. However, it is important to keep in mind that the only truths that are known to be true *a priori* for the Conventionalists, including Sidelle, are the analytic truths. If this weren't the case, then there could be synthetic truths that could be known to be true *a priori*, which would mean that we could know the truth (or falsity) of statements that are not true (or false) based on their linguistic form alone. That is counter to the Conventionalist's language first project, which is clearly evident in Carnap's theory (recall the distinction between internal and external questions). Hence, for the Conventionalists, the only truths that are known to be true a priori are the analytic truths.

So, is the Kempe Sentence an analytic truth? No. For the Kempe Sentence to be an analytic truth, it would have to be the case that the predicate concept 'did not prove the Four-color Theorem with his actual 1879 proof' is part of the subject concept 'Kempe'. The predicate concept in the Kempe Sentence, however, is not a part of the subject concept. If we look again at the hackneyed example, "all bachelors are single males," it is evident that given our linguistic conventions, it is necessarily the case that the predicate concept 'single males' is contained in the subject concept 'bachelors'. This means that we do not need to know anything about the world to know that sentence is true – i.e. it is *a priori* true. Now, it is a contingent fact that Kempe attempted to prove the Four-color Theorem in 1879. Kempe could have been a baker in 1879 who had no interest in mathematics. Furthermore, it is a contingent fact that Kempe came up with that particular erroneous mathematical proof. Hence, the predicate concept of the Kempe Sentence is not contained in the subject concept. If that is the case, then the Kempe Sentence is not an analytic truth, which means that for the Conventionalists it is not

known to be true *a priori*. Now, we know that Kempe was not a baker in 1879 and was in fact the mathematician who came up with that particular erroneous mathematical proof of the Four-color Theorem in 1879. How do we know this? We know these things through the experiences of those people who knew Kempe, or at least his work, at that time. Hence, the truth expressed in the Kempe Sentence is known *a posteriori*.

According to Sidelle, necessary *a posteriori* truths have two components (a necessity component and a contingent epistemic component) and the necessity component will be based on a convention (this is at least how he handled all of the necessary *a posteriori* truths that he considered). Since the truth expressed in the Kempe Sentence is a necessary *a posteriori* truth, it will have both a necessity component and an epistemic component, and the necessity component will be based on a convention. This necessity component, then, must be composed of some analytic criterion – something like the general principle of individuation for chemical kinds – that truths like the one expressed in the Kempe Sentence instantiate. Loosely speaking, the analytic criterion for such truths would be:

> If person *P* has formulated an erroneous proof *E* for mathematical hypothesis *M* in the classical mathematics linguistic framework in the actual world, then there is no possible world in which person *P* uses her proof *E* to prove the mathematical hypothesis *M* in the classical mathematics linguistic framework.

Let's call that analytic criterion "**Mathematical Proof Principle**." We can fill in the details of this Mathematical Proof Principle using the empirical data from the Kempe case. If Kempe has formulated an erroneous proof for the Four-color Theorem 1879 in classical mathematics in the actual world, then there is no possible world in which Kempe can use his 1879 proof to prove the Four-color Theorem in classical mathematics. This, at least on the surface, appears to be correct. Any world where Kempe exists and

devised his 1879 proof is a world in which that proof does not prove the Four-color Theorem. Key here is that the source of the necessity of the truth expressed in the Kempe Sentence is a convention – the Mathematical Proof Principle – just as the source of the necessity of the truth expressed in the sentence "water is H_2O" is a convention – the principle of individuation for chemical kinds.

Yet, if we take a closer look at what's going on in this case, that account of the source of the necessity of the truth expressed in the Kempe Sentence doesn't seem to be correct. There are two interconnected problems with this account of the Mathematical Proof Principle being the source of the necessity of that necessary *a posteriori* truth. First, the Mathematical Individuation Principle is not a convention. To see why this is the case, let's suppose that it is a convention. If the necessity of the truth expressed in the Kempe Sentence is based on a convention (i.e. the Mathematical Proof Principle), then we could have decided to not adopt that convention, yet still adopted the classical mathematics framework.[19] But how is that possible? It's not. To show why this is the case, let's suppose that we didn't adopt the Mathematical Proof Principle, yet still adopted the classical mathematics linguistic framework. If we didn't adopt the Mathematical Proof Principle, then the truth expressed in the Kempe Sentence is contingent, at least according to the Conventionalist. That truth is contingent insofar as

[19] If it is impossible for us to not adopt the Mathematical Proof of Individuation Principle and adopt the classical mathematics linguistic framework, then the Mathematical Proof of Individuation Principle is not conventional. According to Sidelle, "… 'convention' [is] a catchall for mind-based contribution …" (Sidelle, 1989, p. 2). If the Mathematical Proof of Individuation Principle must be adopted when adopting the classical mathematics linguistic framework, it is not a 'mind-based contribution' to that framework. Rather, the Mathematical Proof of Individuation Principle would be a corollary or consequence of adopting the classical mathematics linguistic framework – something that we have nothing to do with. Hence, if the Mathematical Proof of Individuation Principle is a convention, then it must be possible for us to not adopt it, yet at the same time adopt the classical mathematics linguistic framework. I will argue that this is impossible in what follows.

only analytic truths, which are conventions, are necessary for the Conventionalists (the truth expressed in that sentence is not analytic), and, for Sidelle, there must be an analytic general criterion, which is adopted by convention, that makes that *a posteriori* truth necessary (recall that we are supposing that we didn't adopt the Mathematical Proof Principle in this scenario). Now, since the truth expressed in the Kempe Sentence is only contingently true, there is some possible world where Kempe uses his 1879 proof to prove the Four-color Theorem in classical mathematics. Yet, it's a mathematical fact that Kempe's 1879 proof in classical mathematics is not a proof of the Four-color Theorem and this is necessarily the case – this necessary truth follows for the axioms and inference rules of classical mathematics. So there is no possible world where Kempe's 1879 proof proves the Four-color Theorem. Ergo, there is no possible world where Kempe uses his 1879 proof to prove the Four-color Theorem in classical mathematics. Contradiction! Hence, we have no choice when it comes to adopting the Mathematical Proof Principle. If we have no choice about whether to adopt that principle or not, then the Mathematical Proof Principle is not a convention, which contradicts our supposition that it is a convention. Therefore, the Mathematical Proof Principle is not a convention.

If the Mathematical Proof Principle is not a convention, what is it? It is a corollary of the axioms and inference rules of classical mathematics. When we adopt the classical mathematics linguistic framework, we adopt certain axioms and inference rules that serve as the rules for using that framework. In other words, we use those axioms and inference rules to formulate classical mathematical proofs of the necessary truths within that mathematical system. Hence, if we adopt the classical mathematics linguistic framework, then we can use the axioms and inferences rules of that framework to prove

the necessary truths expressed in sentences like "2 + 2 = 4" and the Kempe Sentence. Now, the proofs that we construct using those axioms and inference rules to prove necessary truths like "2 + 2 = 4" and the Kempe Sentence will prove those mathematical truths in every possible world. Why? Whatever follows from those axioms and inference rules of classical mathematics necessarily follows from those axioms and inference rules. If that is the case, then any erroneous mathematical proof will not prove the necessary mathematical truth that it was formulated to prove in all possible worlds. If those erroneous mathematical proofs did prove the classical mathematical hypotheses that they were designed to prove in some possible world, they wouldn't be erroneous and they would prove those classical mathematical hypotheses that they were designed to prove in any possible world. Hence, if a person *P* constructs an erroneous proof *E* for mathematical truth *M* in classical mathematics in the actual world, then there will be no possible world where that *P*'s proof *E* for mathematical truth *M* in classical mathematics proves *M*. Ergo, there will be no possible world where *P* can formulate her proof *E* for mathematical truth *M* in classical mathematics where *P* proves *M* if *E* is an erroneous proof of *M* in the actual world. Note that this conclusion is based on a direct corollary of adopting the axioms and inference rules of classical mathematics and not on an additional convention that we have adopted. The only reason to adopt a convention is to establish a rule for using a framework and this is not needed in the classical mathematics linguistic framework. There is no need to adopt a convention to establish that a person's erroneous proof for some classical mathematical hypothesis is an erroneous proof in every possible world where she formulated that particular proof – this is established by the corollary of the axioms and inference rules of classical mathematics. If we were to adopt a

convention that "says" the same thing, that convention would be doing no work. Therefore, the Mathematical Proof Principle is a not a convention, but a corollary of the axioms and inference rules of the classical mathematics linguistic framework.

The second interconnected problem with the account of the Mathematical Proof Principle being the source of the necessity of necessary *a posteriori* truths that are expressed in sentences like the Kempe Sentence is that it is not the source of the necessity that makes necessary *a posteriori* truths like the one expressed in that sentence necessarily true. The reason why the Mathematical Proof Principle is not the source of the necessity of those truths is directly tied to the Mathematical Proof Principle being a corollary of the axioms and inference rules of the classical mathematics linguistic framework (as opposed to being an additional convention that we adopted). To see why the source of the necessity of *a posteriori* truths like the one expressed in the Kempe Sentence is not the Mathematical Proof Principle, let's track the necessity of the truth expressed in the Kempe Sentence. If the truth expressed in the Kempe Sentence is necessarily *a posteriori* true, then the necessity of the truth expressed in that sentence is a consequence of the Mathematical Proof Principle. If the necessity of the truth expressed in the Kempe Sentence is a consequence of the Mathematical Proof Principle, then the necessity of the truth expressed in that sentence is a consequence of the axioms and inference rules of the classical mathematics linguistic framework insofar as the Mathematical Proof Principle is a corollary of the axioms and inference rules of the classical mathematics linguistic framework. The reason why the Mathematical Proof Principle is a corollary of the axioms and inference rules of the classical mathematics linguistic framework is that those axioms and inference rules are used to construct proofs

of the necessary truths of classical mathematics. Since those truths are necessarily true and follow from the axioms and inference rules of the classical mathematics linguistic framework, any proof that proves those truths using the axioms and inference rules of the classical mathematics linguistic framework will prove those necessary truths in every possible world. Since Kempe's 1879 proof of the Four-color Theorem does not follow from the axioms and inference rules of the classical mathematics linguistic framework, which is what Heawood demonstrated in 1890, Kempe's 1879 proof of the Four-color Theorem does not prove the Four-color Theorem in any possible world. Hence, if the truth expressed in the Kempe Sentence is a necessary *a posteriori* truth, then the source of the necessity of the Kempe Sentence is the classical mathematics linguistic framework itself.

What this argument shows is that Sidelle's Conventionalist account of necessary *a posteriori* truths is, at the very least, not a general account of all necessary *a posteriori* truths within a Conventionalist theory. It is not the case that we adopt a special conventional principle (e.g. the Mathematical Proof Principle) that severs as the source of the necessity for necessary *a posteriori* truths like the one expressed in the Kempe Sentence. In addition, this argument gives us a scheme for challenging Sidelle's claim that the source of the necessity of necessary *a posteriori* truths like the one expressed in the sentence "water is H_2O" is a conventional principle like the chemical kinds individuation principle. Recall that Sidelle's chemical kinds individuation principle states:

> If 'x' denotes something of kind K, then if p is the P-property of the thing denoted by 'x', then 'x' applies to something in any possible situation only if it is (has) p. (Sidelle, 1989, pp. 43-4).

To challenge Sidelle's claim that this principle of individuation is the source of the necessity of necessary *a posteriori* truths like the one expressed in the sentence "water is H_2O" using the scheme of the argument above, we need to show that Sidelle's chemical kinds individuation principle is a corollary of the rules that govern the use of a chemical kind linguistic framework and that the source of the necessity of necessary *a posteriori* truths like the one expressed in the sentence "water is H_2O" is the chemical kind linguistic framework itself. If this can be shown to be the case, then we will have a general account of the source of the necessity of all necessary *a posteriori* truths.

Let's begin by considering an important rule that we would need to adopt to govern our use of a chemical kind linguistic framework. For any such linguistic framework to be useful, there must be some rule that governs the characterization of the different chemicals (I am using 'characterization' instead of 'individuation' in an effort to not confuse this rule of the chemical kind linguistic framework with Sidelle's chemical kinds individuation principle). Suppose that some chemical kind linguistic framework was composed of a characterization rule that did not clearly define a boundary between water and ethanol. That chemical kind linguistic framework would be useless to the extent that it would impair our ability to understand chemical processes that occur in nature. In such a framework there would be no explanation of why the consumption of ethanol causes chemical reactions in the brain that lead to poor coordination, slowed reflexes, etc. whereas the consumption of water does not cause those chemical reactions in the brain. The only thing that could be said within that framework to explain this phenomenon is that there is a chemical that sometimes causes certain reactions in humans when consumed and sometimes doesn't cause those reactions when consume. Why think

that there is only one chemical? Within this framework there is no distinction between ethanol and water so there is no way to tell that there are two different chemicals. Fortunately, we have not adopted this chemical kind linguistic framework. The chemical kind linguistic framework that we have adopted has a rule that governs the characterization of the various chemicals using the atomic structure of those chemicals. By having these clear characterizations of chemicals via their atomic structures, the linguistic framework that we have adopted provides us with a clear demarcation between different chemical kinds. A cursory version of this rule would be:

> **Characterization Rule for Chemical Kind Linguistic Framework:** A chemical is of kind *K* (denoted by the chemical kind term '*K*') if, and only if, that chemical has the atomic structure *X* (denoted by the chemical formula '*Y*').

Note that this is a rule about how to characterize the objects (chemicals) in the domain of discourse in relation to the new predicates and their respective variables in the chemical kinds linguistic framework that we are constructing (keep in mind that the existence of such objects in the domain does not commit Carnap or any other Conventionalist to the *real* existence (or nonexistence) of those objects; rather, those objects only serve as the objects in the domain of discourse that are the values for the new variables for the predicates that we have introduced). To fill in the details of this characterization rule, our scientists need to conduct empirical investigations to discover the different atomic structures of chemicals.[20] Let's use this characterization rule to highlight the boundary

[20] This is inline with Carnap's conception of linguistic frameworks. According to Carnap, "once we have accepted the thing language with its framework for things, we can raise and answer internal questions, e.g. 'Is there a white piece of paper on my desk?', 'Did King Arthur actually live?', 'Are unicorns and centaurs real or merely imaginary?', and the like. These questions are to be answered by empirical investigations. …The concept of reality occurring in these internal questions is an empirical, scientific, non-metaphysical concept. To recognize something as a real thing or event means to succeed in incorporating it into the system of things at a particular space-time position so that it fits together with the other things recognized as real, according to the rules of the framework" (Carnap, 1956a, p. 207).

between water and ethanol. Once the scientists discover that water has the atomic structure of two hydrogen atoms and one oxygen atom, if a chemical is of the water kind (denoted by the chemical kind term 'water'), then that chemical has the atomic structure of two hydrogen atoms and one oxygen atom (denoted by the chemical formula 'H_2O'). Likewise, once the scientists discover that ethanol has the atomic structure of two carbon atoms, six hydrogen atoms, and one oxygen atom, if a chemical is of ethanol kind (denoted by the chemical kind term 'ethanol'), then that chemical has the atomic structure of two carbon atoms, six hydrogen atoms, and one oxygen atom (denoted by the chemical formula 'C_2H_6O'). It is the differing atomic structures of the two kinds of chemicals that serve as the basis for the demarcation between the two chemicals within this linguistic framework. Once we have discovered the atomic structures of the various chemicals, we can use this chemical kind linguistic framework to understand the chemical processes that occur in nature – such as the chemical reactions that occur in the brain after consuming ethanol and the chemical reactions that occur in the brain after consuming water – because there is a clear distinction between different kinds of chemicals.

The characterization rule for chemical kinds is a general rule that provides us with necessary and sufficient conditions for something to be a particular chemical kind. If some chemical is a token of kind *K*, then it has the atomic structure *X*. Suppose that some chemical *C* we come across doesn't have the atomic structure *X*. Then chemical *C* is not a token of the chemical kind *K* since it's a necessary condition for some chemical to be a token of kind *K* that it has the atomic structure *X*. Now, it takes an empirical investigation to fill in the details of that general characterization rule for chemical kinds. Nevertheless, once that investigation has concluded, nothing will count as token of

chemical kind *K* that doesn't have the empirically discovered atomic structure *X* due to the characterization rule. For example, once our scientists have discovered that water has the atomic structure of two hydrogen atoms and one oxygen atom, no other chemical that has a different atomic structure will be a token instance of water. What if our scientists discover some other chemical that has all of the same properties as water, but has the atomic structure of one *X* atom, one *Y* atom, and one *Z* atom? Kripke's reaction to such a scenario, mentioned above, is the correct reaction – this would be a great discovery (we discovered a new chemical kind!) and the new chemical substance would not be counted as an instance of water. If we were to make such a discovery, then we would certainly give that newly discovered chemical a new name to distinguish it from water.

We are now in a position to challenge Sidelle's account of necessary *a posteriori* truths like the one expressed in the sentence "water is H_2O." First, is Sidelle's chemical kind individuation principle a convention? Sidelle's chemical kind individuation principle is not a convention. If it were a convention, then we could have decided not to adopt it yet still adopt the chemical kind linguistic framework. Let's suppose that we did not adopt it but did adopt the chemical kind linguistic framework. If we didn't adopt Sidelle's chemical kind individuation principle, then on Sidelle's account we have removed the analytic component that is responsible for making "water is H_2O" necessarily true. If that sentence is contingently true, then our term 'water' denotes something of the water kind and applies to a chemical *C* in a possible world w*; yet, chemical *C* in w* is not composed of two hydrogen atoms and one oxygen atom (i.e. it's not H_2O). Now, according to the *characterization rule* for chemical kinds (which is a part of the linguistic framework that we have adopted), if a chemical is of the water kind

(denoted by the chemical kind term ‘water’), then that chemical has the atomic structure of having two hydrogen atoms and one oxygen atom (denoted by the chemical formula ‘H_2O’). Once again, within the chemical kind linguistic framework, we need to identify that particular structure so that we can establish the necessary and sufficient conditions for using the variables and the predicates that we introduced when constructing that linguistic framework. In our language (our chemical kinds linguistic framework), then, any chemical that is not composed of two hydrogen atoms and one oxygen atom is not called ‘water’. Hence, given the characterization rule for chemical kinds, we would not call the chemical in w* that is not composed of two hydrogen atoms and one oxygen atom ‘water’. Contradiction! Therefore, Sidelle’s chemical kinds individuation principle is not a convention.

Instead of being a convention that we adopt, Sidelle’s chemical kinds individuation principle is a corollary of the characterization rule for chemical kinds. We must adopt the characterization rule for chemical kinds (or a rule akin to it that has some characterization criterion other than atomic structures) in order for our chemical kinds linguistic framework to be a useful framework for understanding chemicals and their reactions with one another in the world. The characterization rule for chemical kinds gives us necessary and sufficient conditions for identifying unique chemicals that we come across. The specific details concerning the necessary and sufficient condition for identifying any particular chemical kind, e.g. water, are discovered through empirical investigation conducted by scientists. Once those empirical investigations are concluded, the necessary and sufficient conditions for identifying the various chemical kinds are set as are the referents of our chemical kind terms within our language. When we think of

counterfactual scenarios – such as some possible world w* that has a chemical that is used by the inhabitants of that world just like we use water in the actual world ($w^{@}$), the inhabitants of w* use a term, 'water', that looks very much like the term we use to denote water, but it's composed of XYZ – we are considering them through the medium of our chemical kind linguistic framework. Ergo, our chemical kind term *K* will only apply to those chemicals in the counterfactual scenarios that have the same atomic structure *X* that the chemical kind *K* has in the actual world, which was determined by way of empirical investigation. Why not think that the very existence of these counterfactual scenarios makes it so the chemical kind term *K* doesn't necessarily refer to the chemical with the atomic structure *X*? The characterization rule for chemical kinds, which is a scheme or generalization, is made specific for each chemical kind via empirical investigations that our scientists conduct. Our scientists cannot conduct empirical investigations of possible worlds. So the fact that there is some possible world w* that has a chemical in it that is used just like we use water in $w^{@}$ but is composed of XYZ has no bearing on the necessary condition that water is composed of H_2O. There is no XYZ in the actual world. Hence, the chemical kind term *K* will necessarily refer to the chemical with atomic structure *X*. So, if some term *t* in our language (e.g. 'water') denotes something of the water kind, and having the atomic structure *X* (e.g. being composed of two hydrogen atoms and one oxygen atom) is the characterization property of things denoted by that term *t*, and *t* necessarily refers to *X* within the chemical kind linguistic framework we have adopted, then *t* will denote only chemicals in possible worlds that have the atomic structure *X*. This is a consequence of the characterization rule for chemical kinds. It is also a rendition of Sidelle's chemical kind individuation principle. Therefore, Sidelle's

chemical kind individuation principle is a corollary of the characterization rule for chemical kinds.

Sidelle's chemical kind individuation principle is not the source of the necessity of necessary *a posteriori* truths like the one expressed in the sentence "water is H_2O." If Sidelle's chemical kind individuation principle is a corollary of the characterization rule for chemical kinds, which was shown to be the case, then the source of the necessity of such necessary *a posteriori* truths is the characterization rule for chemical kinds, which, as argued above, is a necessary feature of any useful chemical kind linguistic framework. Note the similarity between this account of the source of the necessity of necessary *a posteriori* chemical kind truths and the account of the source of the necessity of necessary *a posteriori* truths with a mathematical component given earlier. To see the similarity explicitly, let's track the necessity of the necessary *a posteriori* truth expressed in the sentence "water is H_2O" just like we tracked the necessity of the Kempe Sentence. If the truth expressed in the sentence "water is H_2O" is necessarily true, then the necessity of that truth is a consequence of Sidelle's chemical kind individuation principle (or something very similar to it). If the necessity of the truth expressed in the sentence "water is H_2O" is a consequence of Sidelle's chemical kind individuation principle and that principle is a corollary of (necessarily follows from) the characterization rule for chemical kinds, which is a necessary component of any useful chemical kind linguistic framework, then the source of the necessity of the truth expressed in the sentence "water is H_2O" is the characterization rule for chemical kinds. Now, it is not the case that all chemical kind linguistic frameworks have a characterization rule for chemical kinds (it's certainly plausible that we could create such a framework). Nevertheless, the

characterization rule for chemical kinds is a fundamental attribute of any useful or practical chemical kind linguistic framework. Since the characterization rule for chemical kinds is a fundamental attribute of useful or practical chemical kind linguistic frameworks and the chemical kind linguistic framework that we have adopted is one of those useful frameworks, the source of the necessity of the truth expressed in the sentence "water is H_2O" is the useful chemical kinds linguistic framework that we have latched onto.

We now have a Conventionalist account of the source of the necessity of necessary *a posteriori* truths that encompasses both the necessary *a posteriori* mathematical truths and the necessary *a posteriori* chemical kind truths. On this account, the sources of the necessity of those necessary *a posteriori* truths are their respective linguistic frameworks, which are nothing more than the axioms and rules that govern the use of those linguistic entities within the language. These axioms and rules are necessary components of their respective frameworks – to not adopt those axioms and rules is to not adopt that framework – and their necessity is the source of the necessity of the necessary *a posteriori* truths. Ergo, the sources of the necessity of the truth expressed in the Kempe Sentence are the axioms and rules of classical mathematics, which must be adopted if we are employing the classical mathematics linguistic framework. Likewise, for the Conventionalist, the source of the necessity of the truth expressed in the sentence "water is H_2O" is the characterization rule for chemical kinds, which governs the application of chemical kind terms and chemical formulas to the objects in the domain of discourse in the chemical kinds linguistic framework and must be adopted if we are employing that particular chemical kind linguistic framework. We therefore have a univocal account of

the source of the necessity for both types of necessary *a posteriori* truths that locates the source of the necessity of those truths in the necessary axioms and rules of their respective linguistic frameworks, which is in perfect accordance with the Conventionalist's thesis. Accordingly, Sidelle's chemical kinds individuation principle is not the source of the necessity of those types of necessary *a posteriori* truths; rather, as shown above, it is a corollary of the characterization rule for chemical kinds.

1.3 The Practical Aspects of Linguistic Framework Choice – The Incompleteness Objection

In this section I am going to examine and critique Carnap's account of linguistic framework choice. The general strategy will be to provide three principles that must be necessarily true in order for Carnap's account of linguistic framework choice to work that cannot be capture in his account of the source of the necessity that makes necessary truths necessarily true (i.e. conventions). Before we get into the details, though, let's briefly review Carnap's external/internal distinction (this distinction plays a pivotal role in the following argument). Recall that Carnap claims there are two kinds of questions concerning the existence of entities such as things, numbers, etc. On the one hand, there are internal questions that can be posed and answered within a linguistic framework. Answers to internal questions are straightforward to the extent that linguistic frameworks provide us with rules for forming and answering those internal questions. For example, we might question whether particular kinds of things (e.g. tables, chairs, etc.) exist while employing the thing linguistic framework. Do tables exist? The procedure for answering this question within the thing linguistic framework is straightforward. To answer this question, we must conduct an empirical investigation using the rules of our thing

linguistic framework and determine whether anything in the world falls under our concept 'table'. If we discover in our investigation that there are in fact objects that fall under our 'table' concept, then tables exist in reality (where 'exist' and 'reality' here are understood as empirical or scientific concepts that are themselves a part of the thing linguistic framework). On the other hand, there are external questions about the *real* – i.e. metaphysical – existence of objects (either concrete or abstract). Carnap contends that these questions, as well as any theoretical answers to them, are nonsensical insofar as they are posed outside of a linguistic framework. To ask whether particular kinds of things (e.g. tables, chairs, etc.) *really* – i.e. metaphysically – exist makes no sense and is a question that cannot be answered (Carnap, 1956a, pp. 206-8).

1.3.1 Essential Properties Revisited

At the end of the last section I presented a way in which a Conventionalist could provide us with an account of the source of the necessity of necessary *a posteriori* truths like the one expressed in the sentence "water is H_2O." As explained above, it is typically thought that sentences like this one are about the essential properties of certain objects. With that in mind, a reasonable question that we might ask is: "What is the essential property of water?" For the Conventionalist, if this question is understood as an external question (e.g. what is the mind-independent, essential property of the substance that we call 'water'?), then it is meaningless and cannot be answered. There are, after all, no rules to guide us in answering an external question insofar as that question is not posed within a linguistic framework. If this question is understood as an internal question (e.g. what is the essential property of the substance that we call 'water' within the chemical kind linguistic framework?), then there *might* be an answer. According to the characterization

rule for chemical kinds, the substance that we call 'water' will have a unique atomic structure. Once we discover the atomic structure of water via empirical investigations, only substances that are composed of two hydrogen atoms and one oxygen atom will be called 'water'. For the Conventionalist, then, having two hydrogen atoms and one oxygen atom is not a mind-independent essential property of the substance that we call 'water'. Rather, having two hydrogen atoms and one oxygen atom *could be construed as* an essential property of the substance that we call 'water' within the chemical kind linguistic framework.

Yet, Carnap warns us to not speak of the essences of any object – neither the *real* essences of objects nor the essences of objects considered within a linguistic framework. Recall part of a quote that we have already seen from Carnap: "in science, we can, strictly speaking, not speak about the essence of an object, not even about the constructional essence of an object [i.e. the essence of an objection considered within a linguistic framework], and thus we cannot raise any question concerning essence" (Carnap, 1967, p. 256). The account of necessary *a posteriori* truths given above, then, is not "strictly speaking" about the essence of an object within a linguistic framework. He goes on to say that the concept of essence, and the related concept of essential relations (between objects), belongs not to science, but metaphysics (Carnap, 1967, p. 256-7).

This particular passage from Carnap is chock-full of modal claims. Taking this quote into account, let's consider the modal status of the following sentence:

> "No Scientific linguistic framework will confirm or disprove the *real* existence of essential properties or essential relations."

Let's call this sentence "No-Essence-Talk". No-Essence-Talk is necessarily true given that "in science, we can, strictly speaking, not speak about the essence of an object …

and thus we cannot raise any question concerning essence" (Carnap, 1967, p. 256). Is No-Essence-Talk an analytic sentence? Does No-Essence-Talk meet the Convention Condition (which must be met if the sentence is necessarily true)? Recall that the Convention Condition is: "a sentence S_i is L-true in a semantical system S if and only if S_i is true in S in such a way that its truth can be established on the basis of the semantical rules of the system S alone, without any reference to (extra-linguistic) facts" (Carnap, 1956b, p. 10). No-Essence-Talk does not meet the Convention Condition. The truth of No-Essence-Talk is dependent on an extralinguistic fact – namely, a fact about how linguistic systems relate to the world. If essential properties and/or relations exist in *reality*, then there are aspects of reality that we cannot speak about using our scientific linguistic frameworks. If essential properties and/or relations don't exist in *reality*, then once again there are aspects of reality that we cannot speak about using our scientific linguistic frameworks. Either way, there is an aspect of *reality* – the existence or non-existence of essential properties and/or relations – that we cannot speak about using our linguistic frameworks. Hence, No-Essence-Talk's truth relies on an extra-linguistic fact, namely the connection between linguistic frameworks and reality, which makes No-Essence-Talk a synthetic truth. If No-Essence-Talk is a synthetic truth, then it does not satisfy the Convention Condition. Therefore, No-Essence-Talk is not a necessary truth.

If No-Essence-Talk is not a necessary truth, then it is logically possible to construct a scientific linguistic framework that is suited for discussing the *real* existence or nonexistence of essential properties or essential relations. The problem with this is that that linguistic framework is not a scientific linguistic framework; rather, it would be a metaphysical linguistic framework, since it is constructed to talk about the relationship

between linguistic frameworks and aspects of reality. Given Carnap's arguments in "The Elimination of Metaphysics Trough Logical Analysis of Language," such a framework is impossible to construct. Recall that Carnap ardently argues that the questions posed in metaphysics about the *reality* of objects (and by extension their relations) were pseudo questions that cannot be answered since they are not framed within a linguistic framework. Once again, according to Carnap, "… [metaphysics] is compelled to employ words for which no criteria of application are specified and which are therefore devoid of sense, or else to combine meaningful words in such a way that neither an analytic (or contradictory) statement nor an empirical statement is produced" (Carnap, 2005, p. 987). From this it is reasonable to assume that Carnap would think that it is impossible to construct a coherent metaphysical linguistic framework for the *real* existence of essential relations or properties insofar as there would be "no criteria of application" for the terms of that linguistic framework. The criteria of application that would have to be adopted if we were to construct a linguistic framework for essences would have to pick out the *real* essential (i.e. necessary) properties or relations of objects via empirical methods, since the sentences about the *real* essential properties or relations of objects are not analytic (they are synthetic and *a posteriori*). Now, which properties are the *real* essential properties of objects? The properties the objects must have to be those objects. Yet, no empirical method by itself is going to be able to determine which properties are the *real* necessary properties of objects by way of observation. Nothing in our observations of two hydrogen molecules bonded to one oxygen molecule in and of itself is going to determine that having two hydrogen molecules and one oxygen molecule is the *real* essential property of water. Hence, there can be no criteria of application for a linguistic

framework for the *real* essences of objects. Furthermore, if it we were able (per impossible) to pick out the *real* essential (i.e. necessary) properties of objects via empirical methods, then the Necessity Criterion would be violated. The Necessity Criterion would be violated since there are necessary truths (i.e. the truths about the *real* essential properties of objects) in the linguistic framework whose necessity is dependent on extra-linguistic facts. In other words, a linguistic framework for *real* essences is incompatible with the Conventionalist's linguistic framework for necessity. Given this, it must be the case that No-Essence-Talk is necessarily true – it is impossible to construct a linguistic framework that is suited for confirming or disproving the *real* existence of essential properties or essential relations. Yet, in the last paragraph it was shown that within Carnap's own theory of linguistic frameworks, No-Essence-Talk is only contingently true (which entails that it is possible to construct a linguistic framework that is suited for confirming or disproving the *real* existence of essential properties or essential relations). Hence, there is a sentence, No-Essence-Talk, that must necessarily be true if Carnap's theory of linguistic frameworks is correct, but the necessity of the truth of that sentence cannot be accounted for in Carnap's theory. This raises the question: What is the source of the necessity of the necessary truth expressed in No-Essence-Talk? This is a question that cannot be answered using Carnap's theory. Therefore, Carnap's theory is, at best, incomplete.

1.3.2 The Practicality Aspect of Linguistic Framework Choice

Recall that there are external-ish types of questions that Carnap acknowledges must be answered – questions concerning the adoption of linguistic frameworks and their incorporated linguistic forms. Should we adopt the chemical kinds linguistic framework?

Should we adopt the classical mathematics framework? For Carnap, the answers to these questions are not based on our theoretical knowledge, although he does think that the acceptance of a linguistic framework can be influenced by our theoretical knowledge (Carnap, 1956a, p. 208). This is clearly evident in his discussion of the thing linguistic framework. Carnap explains:

> The decision of accepting the thing language, although itself not of a cognitive nature, will nevertheless usually be influenced by theoretical knowledge, just like any other deliberate decision concerning the acceptance of linguistic or other rules. The purposes for which the language is intended to be used, for instance, the purpose of communicating factual knowledge, will determine which factors are relevant for the decision. The efficiency, fruitfulness, and simplicity of the use of the thing language may be among the decisive factors. And the questions concerning these qualities are indeed of a theoretical nature. But these questions cannot be identified with questions of realism. They are not yes-no question but questions of degree. (Carnap, 1956a, p. 208)

Part of our deliberations over whether or not to adopt a linguist framework, then, will be based on these theoretical considerations that are practical in nature. If some linguistic framework is inefficient for communicating factual knowledge, then that framework will be of little or no use in our scientific and mathematical theories. If some linguistic framework is futile, then if will be of no use to us. If some linguistic framework is overly complicated for communicating factual knowledge, it will hinder our investigations. Importantly, Carnap contends that the answers to these practicality questions will not be simple yes/no answers. It is rather a matter of degree whether some linguistic framework is efficient, fruitful, and simplistic. Since the practicality of a linguistic framework is measured in degrees, the acceptance of a linguistic framework and the objects in its domain does not commit the Conventionalist to the real – i.e. metaphysical – existence of those objects. There are no correct or completely accurate linguistic frameworks that are founded on metaphysical insights into the objects in those linguistic frameworks since the

linguistic formulation of those metaphysical insights cannot take place within a linguistic framework. In other words, the decision of whether to adopt a linguistic framework is not based on answering external questions about the real – i.e. metaphysical – existence of the objects that they are about – such questions are meaningless. Rather, the acceptance of a linguistic framework is partially influenced by what we want to do with it and how effective it is at allowing us to accomplish what we want to accomplish (Carnap, 1956a, pp. 208, 214, and 221).

One of the most intriguing parts of Carnap's practicality account of the acceptance of linguistic frameworks is the connection between the ontologically noncommittal linguistic frameworks and factual knowledge. There needs to be some connection between our theories of the world (i.e. our linguistic frameworks) and the world – even for the Conventionalist. If there is no connection between a linguistic framework and the world at all, then it is hard to see how that linguistic framework will be efficient and fruitful for communicating our factual knowledge of the world. Now, our primary objective is to discover the source of the necessity that makes necessary truths necessarily true. The Conventionalist's answer is that the source of the necessity of necessary truths is to be found in our conventions for using language a certain way. In what follows I will challenge this claim by evaluating the connection between our theoretical knowledge (i.e. our linguistic frameworks) and our factual knowledge of the world using the Conventionalist's own theory. I will begin by considering the source of the necessity of a specific mathematical truth that must be true. After that, I will discuss the source of the necessity of a certain necessary truth about linguistic frameworks. In

both cases I will show that the source of the necessity of those necessary truths is not found in conventions for using language a certain way.

Carnap's account of linguistic framework selection based on practical considerations is comprehensive; consequently, our adoption of a mathematical linguistic framework will be based on its efficiency, fruitfulness, and simplicity. To evaluate the connection between mathematical linguistic frameworks that we might choose and our factual knowledge, let's begin by considering a mathematical linguistic framework that we would never choose to adopt based on our factual knowledge even though it meets the practical criteria that guide framework selection. Let's call this mathematical linguistic framework "the odd mathematical linguistic framework." In this mathematical linguistic framework there are no even numbers. The odd mathematical linguistic framework is comprised of various predicates, e.g. 'odd number', variables that are used with those predicates, and constants that signify or refer to objects in the domain of the odd mathematical linguistic framework. Importantly, there is no predicate 'even number', no variables to use with that predicate, and no constants for those variables for even numbers in the odd mathematical linguistic framework. Nevertheless, there are certain axioms and rules for using that framework. However, one important axiom that will be missing from the odd mathematical linguistic framework is the axiom for addition. Adding two odd numbers together will always produce an even number. Since there are no even numbers in the odd mathematical framework, the axiom for addition is not one of the axioms of that framework.

Studying the properties of the odd mathematical linguistic framework might be interesting in its own right and could be quite fruitful. It would be interesting to learn

what follows form such a scant mathematical linguistic framework. Studying the odd mathematical linguistic framework could even potentially give us insights into important properties of other mathematical systems (e.g. classical mathematic). It might not be the most efficient mathematical linguistic framework; nevertheless, efficiency is a matter of degree and it might be more efficient to use such a system for certain purposes due to its simplicity. However, it is not a framework that we would adopt based on our factual knowledge of the world. In other words, it is paramount to have a mathematical linguistic framework to aid in our scientific investigations and our everyday lives and the odd mathematical linguistic framework would not aid us in our endeavors. So, the odd mathematical linguistic framework would not be the mathematical linguistic framework that we would adopt based on our factual knowledge of the world.

Let's suppose that we have adopted the thing linguistic framework (it is hard to see why we wouldn't adopt this framework). When we look out into the world through the medium of this linguistic framework we will experience an even number of things. I have two arms, two hands, two legs, two feet, eight short sleeve shirts, etc. Furthermore, we recognize similarities between things that we experience. For example, I have ten black socks and three blue socks (one escaped). There is a similarity between the ten black socks and three blue socks – they are all socks and fall under the general category 'socks'. Since all of these objects (the ten black socks and the three blue socks) fall under the category 'socks', I know that I have thirteen socks. How do I know this? Very simply – by adding the number of black socks that I have to the number of blue socks that I have. Now, it certainly is the case that inside the bounds set by the Conventionalist theory we could decide to adopt the odd mathematical linguistic framework as our sole

mathematical linguistic framework. Nothing in the Conventionalist theory rules out this possibility. But if we were to only adopt the odd mathematical linguistic framework, then we would be unable to account for our factual knowledge – for our factual knowledge of the objects and the relationships between similar objects that we experience. If there are no even numbers in the mathematical linguistic framework that we have adopted, then there is no way to say, "I have ten black socks." If there is no axiom of addition in the mathematical linguistic framework that we have adopted, then there is no way to account for my factual knowledge that sentence "I have thirteen socks" is true. So no matter how efficient, fruitful, or simple the odd mathematical linguistic framework is, we would never adopt it as our sole mathematical linguistic framework if we have any interest in account for our factual knowledge of the world through the medium of the thing linguistic framework.

There is another, and for our purposes more important, lesson to learn from this analysis of the practical considerations of linguistic framework choice and our factual knowledge. It is necessarily the case that if I have ten black socks and three blue socks, then I have thirteen socks. More generally, it is necessarily the case that if I have X number of A's (e.g. things) and Y number of A's, I have $X+Y$ number of A's. Let's call this general necessity "EMPaddition." We know that EMPaddition is true via our experiential knowledge of the world. So what is the source of the necessity of EMPaddition? The source of EMPaddition's necessity is not the thing linguistic framework (or any other A linguistic framework) itself insofar as EMPaddition is

necessarily true in all linguistic frameworks.[21] No matter what linguistic framework we use to characterize the objects that we experience, EMPaddition will be true of that linguistic framework (e.g. EMPaddition is even true of the chemical kinds linguistic framework that doesn't differentiate between water and ethanol that we considered earlier – if you have one pint of water/ethanol and I have one pint of water/ethanol, together we have two pints of water/ethanol). The source of EMPaddition's necessity is not the classical mathematics linguistic framework (or any other mathematical linguistic framework that has even numbers and an addition axiom) that is accompanying (i.e. used with or added to) the thing linguistic framework (or any other *A* linguistic framework) that we have adopted. The number of socks (or whatever *A*'s) that I have is not dependent on the classical mathematics linguistic framework or any other mathematical framework; rather, it is dependent on the way the world is. The source of EMPaddition's necessity is not rooted in the combination of the thing linguistic framework (or any other *A* linguistic framework) and the classical mathematics linguistic framework (or any other mathematical linguistic framework that has even numbers and an addition axiom) that we have adopted. No matter what linguistic framework that we choose to model our experiential or factual knowledge of the world, EMPaddition will characterize the mathematical relations that we encounter in our experiences of the world. For that

[21] Is EMPaddition necessarily true in a linguistic framework that has vague predicates? Yes. Take for example the predicate 'bald'. Within the baldness linguistic framework, the predicate 'bald' is vague to the extent that there are borderline cases where it is unclear whether a person with X-number of hairs is bald or not. Now, if person A and person B are both clearly bald and sitting on a bench, then there are two bald people sitting on a bench. If person A is clearly bald and it is unclear whether person B is bald (person B is a borderline case), then it is unclear whether there are two bald people sitting on the bench. This is not a failure of EMPaddition holding in the baldness linguistic framework; rather, it is a result of not having a clearly defined predicate.

reason, the most efficient, fruitful, and simple mathematical linguistic frameworks will be ones that have even numbers and the addition axiom. Hence, the amount of socks (or whatever *A*'s) I have is dependent on how the world is (i.e. the world's contribution to our empirical knowledge) and no matter what linguistic framework that we use to characterize the objects that we experience, EMPaddition will be true of that linguistic framework.

The source of EMPaddition's necessity is therefore the world. We will undoubtedly come across multiple instances of objects in the world that fall under the same category characterized by characterization rules for the practical linguistic framework that we have chosen for categorizing those objects that we experience. This means that EMPaddition will be true in any linguistic framework that characterizes the objects that we experience that we would adopt based on the grounds of its practicality. Even if we were to adopt the highly inefficient, but precise, linguistic framework for the objects that we experience in which only one object fell under each predicate, EMPaddition would still be true in that linguistic framework. If I have the one and only thing that falls under the predicate *A* in that linguistic framework, then it is necessarily the case that if I have the only *A* and you don't have *A*, then together we have the only *A*. Furthermore, the world being the source of EMPaddition's necessity explains why we would never adopt the odd mathematical linguistic framework as our sole mathematical linguistic framework based on our factual knowledge. There are mathematical relations between things in the world (no matter how we individuate those things) that is in part capture by EMPaddition and this mathematical feature of the world dictates which mathematical linguistic frameworks will be fruitful and efficient. The odd mathematical

linguistic framework will not be a fruitful and efficient mathematical linguistic framework to accompany (either used with or combined to) any linguistic framework that characterizes the objects that we experience insofar as EMPaddition is not true of the odd mathematical framework.

Another necessary feature of any practical linguistic framework for our factual knowledge of the world is that they must have characterization rules for their predicates. These characterization rules guide us in applying the predicates of the linguistic framework to the objects that we experience. For example, the chemical kind linguistic framework has the characterization rule for chemical kinds that governs the use of chemical kind terms via the atomic structures of the objects that we experience. The details of this characterization rule are filled in through empirical investigations. After our scientists discover that water has two hydrogen atoms and one oxygen atom, anytime we come across a chemical that has two hydrogen atoms and one oxygen atom we know via the characterization rule for chemical kinds that that chemical falls under the predicate 'water'. Ideally, the characterization rules for all linguistic frameworks for our factual knowledge of the world would provide us with necessary and sufficient conditions for determining which objects that we experience fall under which predicates. But this is not the case for all such linguistic frameworks. There are instances of vague characterization rules such as the one used for the predicate 'bald'. In cases where there is a vague characterization rule, there are borderline cases where the characterization rule does not guide us in the application of the predicate. Is it proper to call someone "bald" if that person only has 20,000 hairs on his head? The characterization rule for 'bald' does not clearly state how many hairs a person must have on his head in order to use the

predicate ‘bald’ correctly (if it did, then ‘bald’ wouldn’t be a vague predicate). Consequently, the vague characterization rule for ‘bald’ won’t help us in answering the question of whether we should call the person with 20,000 hairs on his head “bald.” Nevertheless, it is not the case that ‘bald’ doesn’t have a characterization rule. If there were no characterization rule for ‘bald’, then we would never know when to use that predicate and whichever linguistic framework it belongs to would be useless (at least when it comes to using that predicate). There are, however, clear cases where the application of that predicate is correct and clear cases where it is incorrect. For example, it is correct to call a man with no hair on the top of his head “bald”. It is incorrect to describe a microwave as being bald. So even linguistic frameworks that have vague predicates have rules that roughly characterize some property of the objects that we experience. Hence, all practical linguistic frameworks for our factual knowledge of the world must have characterization rules that provide us with guidance (to varying degrees) for applying the predicates of the linguistic frameworks to the objects that we experience.

If all practical linguistic frameworks for our factual knowledge of the world must have characterization rules that provide us with guidance (to varying degrees) for applying the predicates of the linguistic frameworks to the objects that we experience, then the truth expressed in the sentence “all practical linguistic frameworks for our factual knowledge of the world have characterization rules that provide us with guidance (to varying degrees) for applying the predicates of the linguistic frameworks to the objects that we experience” is necessarily true. Let’s call that sentence “PRACframework”. In essence, PRACframework puts a constraint on the many possible linguistic frameworks that are available – it indicates which linguistic frameworks are

viable (i.e. do the work that they are intended to do). As explained above, we could certainly adopt a linguistic framework that does not have characterization rules for applying the predicates of the linguistic framework, but that framework would not be practical for accomplishing our goals. Now, what is the source of the necessity of the necessary truth expressed in PRACframework? The source of its necessity cannot be rooted in a convention. If it were rooted in a convention, then the truth expressed in PRACframework would be an analytic truth of a linguistic framework about linguistic frameworks for our factual knowledge of the world (recall that only analytic truths are necessarily true for the Conventionalists). Now, if PRACframework were an analytic truth in a linguistic framework about linguistic frameworks for our factual knowledge of the world, then we could certainly decide not to adopt that linguistic framework. Suppose for *reductio* that we decided not to adopt that linguistic framework. Then there would be linguistic frameworks for our factual knowledge of the world that don't have characterization rules for their predicates that are practical. If those linguistic frameworks are practical, then they are efficient, fruitful, and simple. But how could that be? A linguistic framework for our factual knowledge of the world that doesn't have any characterization rules for its predicates will not provide us with the guidance we need for using its predicates to describe the objects that we experience. Such a linguistic framework would be inefficient insofar as we would be spending all of our time trying to determine which predicates apply to which objects that we experience. If we are spending our time do that, then we are not conducting fruitful empirical investigations. Furthermore, a linguistic framework for our factual knowledge of the world with no characterization rules would not be simple to use since it is lacking the straightforward

rules that clearly stipulate how to use the predicates of the linguistic framework. Hence, any linguistic framework for our factual knowledge of the world that doesn't have characterization rules for its predicates is impractical. It is not the case, then, that we can choose to not adopt the linguistic framework in which the truth expressed in PRACframework is an analytic truth. If we have no choice in the matter, then PRACframework is not an analytic truth in a linguistic framework about linguistic frameworks for out factual knowledge of the world (if it were, we would have a choice in the matter). Therefore, the source of the necessity of the truth expressed in PRACframework is not a convention.

What is the source of the necessity expressed in PRACframework then? The Conventionalist cannot use her account of the source of the necessity of necessary truths to answer this question since the source of the necessity of the truth expressed in PRACframework is not a convention; nevertheless, their might be another subjectivist answer available. The truth expressed in PRACframework has to do with a certain feature that all practical linguistic frameworks for our factual knowledge of the world share. Practical linguistic frameworks for our factual knowledge of the world must have characterization rules that govern our use of the predicates in those kinds of linguistic frameworks. It is tempting to think, then, that we are the source of the necessity of the truth expressed in PRACframework – not by convention, but as a subjective feature of how humans understand the world. We are the ones that need guidance in applying the predicates of the linguistic frameworks to the objects that we experience in the world. We are the ones who create the characterization rules that categorize the objects that we experience under the predicates of the linguistic frameworks. And, most importantly, we

are the ones who find linguistic frameworks that don't have characterization rules impractical. Since PRACframework is about these aspects of practical linguistic frameworks for our factual knowledge of the world, we are the source of the necessity of the truth expressed in PRACframework.

Yet, we are not the source of the necessity of the truth expressed in PRACframework. To see why this is the case, let's discuss why we need characterization rules for our practical linguistic frameworks for our factual knowledge of the world. We need characterization rules for the practical linguistic frameworks for our factual knowledge of the world to the extent that those linguistic frameworks are designed for specific purposes – (i) to aid individuals in comprehending their sense experiences, and (ii) to convey our factual knowledge of the objects that we experience in the world to others. The job of any practical linguistic framework for our factual knowledge of the world, then, is to aid in our understanding the objects that we experience and to facilitate communicating that knowledge to others. For practical linguistic frameworks for our factual knowledge of the world to be useful, they must have characterization rules that pick our certain properties of the objects that we come across that serve as the properties for categorizing those objects within the linguistic framework. Now, there might be multiple ways to categorize the objects that we experience (i.e. there might be many different linguistic frameworks that are practical). For instance, there might be multiple ways to categorize the animals that we come across under the concept (predicate) 'species'. The correct application of species concepts in a species linguistic framework that has characterization rules based on mating and viable offspring will sometimes differ from the correct application of species concepts in a species linguistic framework that has

characterization rules based on occupying a particular ecological niche. Nevertheless, the fact that we must have characterization rules for these linguistic frameworks for our factual knowledge of the world is solely based on the fact that the objects that we are experiencing have properties that can be used to categorize those objects in our thoughts and to communicate our factual knowledge of the world to others. There must be some connection between our linguistic models of the world (i.e. linguistic frameworks) and the thing that it is designed to model (i.e. the world) in order for us to truly have factual knowledge of the world. The fact that the objects that we experience have properties that we can use for their categorization is in no way dependent on us. Hence, the requirement that all practical linguistic frameworks for our factual knowledge of the world must have categorization rules is grounded in the fact that the objects that we experience have properties that can be used for that purpose. Therefore, the source of the necessity of the truth expressed in PRACframework is the world.

We have, then, two necessary truths – one expressed in EMPaddition and the other expressed in PRACframework – that must be true of any practical linguistic framework for our factual knowledge of the world. The source of the necessity of these necessary truths is not found in our conventions to use language a certain way. EMPaddition and PRACframework do not express analytic truths in linguistic frameworks that we can choose to not adopt. We have no choice in the matter. Hence, the Conventionalists' claim that the source of the necessity of all necessary truths is to be found in our analytic conventions to use language a certain way is incorrect. The source of the necessity of the necessary truths expressed in EMPaddition and PRACframework

is the world. The Conventionalists' account of the source of the necessity of necessary truths is therefore, at best, an incomplete account.

1.4 Quine's "Truth by Convention"

At the end of the last section I argued that there were two necessary truths, the necessary truth expressed in EMPaddition and the necessary truth expressed in PRACframework, whose necessity cannot be grounded in our conventions. Both of these necessary truths are crucial for the pragmatic aspect of the Conventionalist's thesis. The truth expressed in EMPaddition must be true of any practical linguistic framework that aligns with our experiences and factual knowledge of objects in the world and the truth expressed in PRACframework must be true of any linguistic framework that we would adopt based on it's practicality. Hence, there are necessary truths that are crucial for Conventionalism whose necessity is not accounted for in Conventionalism. Quine, in his article "Truth by Convention," presents a similar style argument. Instead of focusing on the source of the necessity that makes necessary truths necessarily true, however, Quine focuses on the Conventionalist's notion of definitional truth in logic and mathematics. Quine contends that there are certain logical truths that are not true by convention. If they are not true by convention, then the Conventionalist's account of the analyticity of the truths of logic and mathematics is incorrect. In this section I will present Quine's arguments in "Truth by Convention" in some detail.

Quine begins his objection to the notion of truth by convention by discussing the conventional nature of definitions. According to Quine, "functionally, a definition is not a premise to theory, but a license for rewriting theory by putting definiens for definiendum or vice versa. By allowing such replacements a definition transmits truth: it

allows true statements to be translated into new statements which are true by the same token" (Quine,1976c, p. 78). For example, if we define 'bachelor' as 'single male who is eligible for marriage', then we can substitute the definiendum 'bachelor' for the definiens 'a single male who is eligible for marriage' and vice versa. If the sentence "John is a single male who is eligible for marriage" expresses a truth, then when we substitute in 'bachelor' for ' a single male who is eligible for marriage' to get the sentence "John is a bachelor", and that sentence will be true by definition. After all, if John is a single male who is eligible for marriage, then John is a bachelor by definition.

It is important to note here that Quine is contending that definitions merely transmit truth – they do not establish truth. According to Quine, "considered in isolation from all doctrine, including logic, a definition is incapable of grounding the most trivial statement …" (Quine, 1976c, p. 79). Let's now consider the truth expressed in the sentence "all bachelors are single males who are eligible for marriage." All that a definition does in this case is transmit the truth of that sentence to the sentence "All single males who are eligible for marriage are single males who are eligible for marriage," which is a tautology. In other words, both of those sentences are true by the same token – logic. Now, Carnap considers such truths to be analytic. Quine, in "Carnap and Logical Truth," explains, "'analytic' means true by synonymy and logic, hence no doubt true by language and logic, and simply true by language *if* the linguistic doctrine of logical truth is right" (Quine, 1976a, p. 129, Quine's emphasis). We will soon see that the Conventionalist doctrine of logical truth is incorrect.

Next, Quine discusses the reductionist project of defining all mathematical expressions on the basis of logical expression alone. If all of the mathematical

expressions are definable on logical expressions alone, then we should be able to substitute one for the other in our sentences without changing their truth-value. Furthermore, if all logical sentences are true by convention, which is something that the Conventionalist contends is the case, then the truths of mathematics are true by convention alone. Now, Quine considers the status of what we may call "mixed sentences" – sentences that contain an empirical component and a mathematical component. He has us consider the mathematical truth expressed in the sentence "Smith's age plus Brown's age equals Brown's age plus Smith's age". (Note that we can replace 'Smith's age' and 'Brown's age' with any grammatically equivalent expressions (e.g. 'apples in the blue bucket' and 'apples in the red bucket') – Quine calls these "vacuous variants".) According to Quine, there is a mathematical "skeleton" that the truth expressed in that sentence is founded on. The mathematical skeleton of the truth expressed in that sentence is the commutative property of addition, which is an essential property of addition. That property will be expressed in every vacuous variant of that sentence – Quine calls this "the expression occurring essentially" (Quine, 1976c, pp. 78-81). Quine explains, "every mathematical truth either is a truth in which only mathematical and logical expressions occur essentially, or is a definitional abbreviation of such a truth. Hence, granted definitions of all mathematical expression in terms of logic, the proceeding conclusion shows that all mathematical truths become definitional abbreviations of truths of logic – therefore the truths of logic in turn" (Quine, 1976c, pp. 81-2). Since truth expressed in the sentence "Smith's age plus Brown's age equals Brown's age plus Smith's age" contains a mathematical expression occurring essentially – something like "*a* plus *b* equals *b* plus *a*" – it is true by convention.

According to Quine, if the truths of mathematics are truly conventional and they are definitional abbreviations of logical truths, then it must be the case that the logical truths are themselves conventional. Why must that be the case? Quine explains:

> And the doctrine that mathematics is analytic accomplishes a less fundamental simplification for philosophy than would at first appear, if it asserts only that mathematics is a conventional transcription of logic and not that logic is convention in turn: for if in the end we are to countenance any *a priori* principles at all which are independent of convention, we should not scruple to admit a few more, nor attribute crucial importance to conventions which serve only to diminish the number of such principles by reducing some to others. (Quine, 1976c, pp. 87-8)

If it turns out that some of the truths of logic, which are *a priori*, are not conventional, then what's stopping us from countenancing other *a priori* truths – possibly some mathematical truths whose reduction to logical truths are particularly daunting – as also being *a priori* truths that are not based on conventions (i.e. not analytic)? It is hard to see how there could be any principled distinction between *a priori* truths that are based on conventions and *a priori* truths that are not based on conventions if both exist. Just because we can create a convention that postulates the truth of some statement doesn't mean that that statement is true by that convention (there are, after all, other statements that are *a priori* true that are not conventional if both exist). Furthermore, if some of the truths of logic were not conventional, then the only importance in the project of reducing the mathematical truths to the logical truths would be to have fewer *a priori* truths not based on conventions around. Quine seems to think that there is no real philosophically fundamental value in that project – he seems to think it is all or nothing. Given the Conventionalist's thesis, this makes sense. We are the ones who create the linguistic frameworks. We are the ones who determine which truths are analytic. For the Conventionalists, the only *a priori* truths are the analytic truths. Hence, we are the ones

who determine which truths are *a priori* true. If there are *a priori* truths not based on conventions, then the project of Conventionalism is bankrupt.

Quine then turns to consider the adoption of the conventions of logic. One immediate problem is that there is a potential infinite amount of truths that will be true by logic alone. There must be some way to capture all of these truths with conventions if logical truths are truly conventional. Quine provides us with a sketch of how one might go about designing conventions to capture the infinite amount logical truths. He begins by considering the essential expression for hypothetical syllogism:

(1) If if *p* then *q* then if if *q* then *r* then if *p* then *r* (Quine, 1976c, p. 92).

If all instances and potential instances of hypothetical syllogisms are true by logic alone and the truths of logic are conventional, then there must be a convention that we have adopted that makes all the instances and potential instances of hypothetical syllogism true by convention. Quine provides us with the following necessary convention to account for the infinite number of possible hypothetical syllogisms:

> (I) *Let all results of putting a statement for 'p', a statement for 'q', and a statement for 'r' in (1) be true* (Quine, 1976c, p. 92).

We will also have to adopt a convention for modus ponens. If all instances and potential instances of modus ponens are true by logic alone and the truths of logic are conventional, then there must be a convention that we have adopted that makes all of the instances and potential instances of modus ponens true by convention. To account for these truths, we could adopt the following convention:

> (II) *Let any expression be true which yields a truth when put for 'q' in the result of putting a truth for 'p' in 'If p then q'* (Quine, 1976c, p. 92).

Lastly, Quine consider the classical logic rule of explosion. If all instances and potential instances of explosion are true by logic alone and the truths of logic are conventional, then there must be a convention that we have adopted that makes all of the instances and potential instances of explosion true by convention. Quine gives us the following convention for explosion:

> (III) *Let all results of putting a statement for 'p' and a statement for 'q' in 'If p then if ~ p then q' or 'If if ~ p then p then p' be true* (Quine, 1976c, p. 94).

Now, Quine acknowledges that this is only a sketch of some of the conventions that we would need to adopt to account for the potential infinite amount of logical truths. He explains that adding a convention for the universal quantifier would be challenging, but necessary for any account that captures all of the logical truths via conventions (Quine, 1976c, p. 96). Nevertheless, we at least have an idea of how a Conventionalist would go about creating conventions to capture all of the instances and potential instances of the laws of logic in our language.

There is, however, a problem with this procedure. Quine explains, "in a word, the difficulty is that if logic is to proceed mediately from conventions, logic is needed for inferring logic from the conventions. Alternatively, the difficulty which appears thus as a self-presupposition of doctrine can be framed as turning upon a self-presupposition of primitives." (Quine, 1976c, p. 104).[22] The problem here has to do with the generality of the conventions. In order to use the conventions to derive the truth of specific instances of logical truths, we must make logical inferences (Quine, 1976c, 103). For example,

[22] Quine reiterates this point in his article "Carnap and Logical Truth." According to Quine, "… logical truths, being infinite in number, must be given by general conventions rather than singly; and logic is needed then to begin with, in the metatheory, in order to appy the general conventions to individual cases" (Quine, 1976a, p. 115).

suppose we want to get from the general truth captured in convention (III) to the specific logical truth expressed in the sentence "if it is raining, then if it is not raining, then the moon is made of cheese." To get to the logical truth expressed in that sentence, we would need to make the following inference (call this proof "explosion proof"):

> 1. Let all results of putting a statement for '*p*' and a statement for '*q*' in 'If *p* then if ~ *p* then *q*' or 'If if ~ *p* then *p* then *p*' be true (restatement of (III)).
>
> 2. If all results of putting a statement for '*p*' and a statement for '*q*' in 'If *p* then if ~ *p* then *q*' or 'If if ~ *p* then *p* then *p*' be true, then the sentence "if it is raining, then if it is not raining, then the moon is made of cheese" expresses a truth of logic.
>
> 3. Therefore, the sentence "if it is raining, then if it is not raining, then the moon is made of cheese" expresses a truth of logic.

To make this inference we used the logical truth captured in convention (II) in our metatheory. Now, to apply convention (II) to the explosion proof in our metatheory will itself require a logical inference, which is the beginning of an infinite regress of logical inferences. Hence, we had to use logic to infer logic from the conventions. The other way to understand the problem that Quine mentions is that it appears that we must rely on primitive notions of the idioms of logic (e.g. the if-idiom) to establish the conventions for logic. According to Quine, "… the difficulty is that communication of (I) – [(III)] themselves depends upon free use of those very idioms which we are attempting to circumscribe, and can succeed only if we are already conversant with the idioms" (Quine, 1976c, p. 104). In other words, we must take as primitive the laws of logic in order to construct conventions for the laws of logic. Since there must be a priori truths of logic to create the conventions for logic, there is no need for the conventions – the Conventionalist's account of logical truths is therefore incorrect.

1.5 Conclusion

In this chapter I provided a critique of the Conventionalist account of the source of the necessity that makes necessary truths necessarily true. According to the Conventionalist, the source of the necessity of the necessary truths is to be found in our conventions for adopting linguistic frameworks. The necessary truths are the analytic truths that serve as the rules that govern the use of the predicates and variables that are introduced into the linguistic framework. For the Conventionalists, the analytic truths are both true and necessary via convention. I showed that the Conventionalist can provide an account of necessary *a posteriori* truths using only the characterization rules that govern the use of the predicates and the variables in the linguistic framework (as opposed to having to introduce new analytic individuation principles on top of the characterization rules, which Sidelle claimed needed to be done). Keep in mind that the necessity of an analytic characterization rule is the source of the necessity of necessary *a posteriori* truth. I then showed that the Conventionalist account of the source of the necessity that makes necessary truths necessarily true is, at best, an incomplete account of the source of necessity by providing three truths that must be necessarily true, if Conventionalism is correct, whose necessity cannot be accounted for using the Conventionalist theory. Lastly, I recounted Quine's influential objection to the Conventionalist's account of truth by convention. In Chapter 4, I will raise one last objection to the Conventionalist's account of the source of necessity – it's incompatibility with Global Modal Error.

Chapter 2: Necessity by Convention: A Critique of the Neo-conventionalist's Account of the Source of Necessity[23]

2.0 Introduction

In Chapter 1, we considered the Conventionalist's account of the source of the necessity that makes necessary truths necessarily true. For the Conventionalists, the only truths that are necessarily true are the analytic truths, which are necessary and true by convention. In this chapter we will consider an alternative Dependent Account of the source of necessity that is based on conventions – Neo-conventionalism.

To begin, let's recall the motivation behind our search for the source of necessity. The proposition that $2 + 3 = 5$ is true and so is the proposition that black crows live in North America. It is the case that $2 + 3 = 5$ and it is also the case that black crows live in North America. This, however, is not all that can be said about the truth of these propositions. It could never have been the case that $2 + 3 \neq 5$ whereas it could have been the case that black crows don't live in North America. So the proposition that $2 + 3 = 5$ and the proposition that black crows live in North American are true in different ways – the proposition that $2 + 3 = 5$ is necessarily true whereas the proposition that black crows live in North America is contingently true. What is the source of the necessity that makes necessary truths necessarily true? This is the question of the source of necessity: The Source of Necessity Question (SNQ).

[23] I very appreciative of all of Peter Hanks help with this chapter. Earlier versions of this chapter were presented to the Department of Philosophy at the University of Minnesota and at the American Philosophical Association Pacific Division Meeting in 2015. I am very grateful for all of the helpful comments that I received at those events.

Ross Cameron, in his article "On the Source of Necessity," argues that the answer to SNQ is: The necessary truths are necessarily true because they are true at every possible world. According to Cameron, "the problem of the source of modal truth is the problem of explaining what it is about the possible worlds that makes them possible: What it is that all the possible worlds have that all the impossible worlds lack that accounts for the former but not the latter representing ways things could have been?" (Cameron, 2010a, p. 148). In other words, if in our answer to SNQ we are using the modal notion of possible worlds in our explanation of the source of necessity, then SNQ boils down to a question about possible worlds – what do the possible worlds have that the impossible worlds lack that allows the possible worlds to represent a ways things could have been? Let's call that question The Possible Worlds Question (PWQ).

In this chapter I am going to evaluate and critique Cameron's Neo-conventionalist response to PWQ.[24] I begin by consider how a Modal Realist might answer PWQ, and then carefully examine the Neo-conventionalist's answer to PWQ. I then develop two objections to Neo-conventionalism. The first argument, the Incompleteness Argument, demonstrates the Neo-conventionalist's inability to provide us

[24] Cameron's Neo-conventionalism is inspired by Ted Sider's own very roughly sketched reductive theory of modality in "Reductive Theories of Modality." I will provide a full critique of Sider's account in Chapter 3. However, since Cameron's account is inspired by Sider's account, I will show that slightly modified versions of my arguments against Neo-conventionalism apply to the *conventionalist* version of Humeanism in the footnotes along the way. Seeing the modifications that I make will draw out a distinction between the two accounts. Some of these arguments will be given in more detail in Chapter 3. In "Reductive Theories of Modality" Sider describes a reductive theory of modality where it is a convention that certain sorts (kinds) of truths – most notably the mathematical, logical, and analytic truths – are labeled 'necessary'. Sider's account changes slightly in his book *Writing the Book of the World* with the "partial" development of his Humean theory of modality. There Sider claims that it might be a convention that certain sorts of truths are labeled 'necessary'; however, it might instead be something about the way we are. According to Sider, "perhaps the choice [of which sorts of truths are considered necessary] reflects something important about the role 'necessary' plays in our conceptual lives, in which case the facts are "subjective" (or "projective")" (Sider, 2011, p. 269). Sider does not indicate which of the two he prefers.

with an account of the source of the necessity for *all* necessary truths using her own system. The second argument, the Stroud Argument, challenges a key component of Neo-conventionalism – it challenges the very notion of us *determining* (in a particular way) which worlds are the possible worlds and which worlds are the impossible worlds.

2.1 Two Divergent Answers to PWQ

Let's begin by taking a closer look at PWQ. Cameron explains that by asking what the possible worlds have and the impossible worlds lack that make the former representations of the way things could have been, we are inadvertently evoking a conception of there being some *natural* distinction between the possible worlds and the impossible worlds (i.e. we, humans, are in no way responsible for the division between the possible worlds and the impossible worlds) (Cameron, 2010a, p. 148). But what could this natural distinction between the possible worlds and the impossible worlds be?

The Modal Realist has a ready-made answer to this question.[25] For Modal Realists, possible worlds are worlds that exist simpliciter (they are not worlds that exist *as* mere abstract objects – I will say more about abstract possible worlds shortly). If we adopt David Lewis' conception of the ontology of possible worlds and impossible worlds, then we will have a cogent explanation of the natural distinction between the possible worlds and the impossible worlds. According to Lewis, "as possibility amounts to existential quantification over the worlds, with restricting modifiers inside the quantifiers, so necessity amounts to universal quantification. …What is impossible is the case at no worlds; what is contingent is the case at some but not at others" (Lewis, 1986, p. 7). The objects that Lewis is quantifying over are worlds that exist – simpliciter,

[25] David Lewis' Modal Realism will be examined in more detail in Chapter 5.

without qualification, or in other words, concretely. For Lewis, then, possible worlds are worlds that concretely exist and impossible worlds are worlds that do not.[26] Therefore, there is a natural distinction between the possible worlds and the impossible worlds – the former concretely exist and the latter don't. So, what do the possible worlds have that the impossible worlds lack that allows them represent ways things could have been? The Modal Realist will answer "concrete existence." The possible worlds concretely exist; hence, they represent a way things could be. The impossible worlds do not concretely exist; hence, they do not represent a way things could be.

The Modal Realist does offer a cogent answer to PWQ; nonetheless, most modal theorists, including Cameron, find the ontological price of adopting such a theory far too high. Most modal theorists (and philosophers in general) prefer parsimonious ontologies and find the Modal Realist's bloated ontology troubling. In light of this, certain modal theorists – the Ersatzers – have proposed theories in which the possible worlds are not objects that concretely exist. For the Ersatzers, the possible worlds are nothing more than abstract objects that represent ways in which the world could have been – a multitude of abstract objects existing is not as bothersome as a multitude of worlds concretely existing. If the possible worlds are these abstract objects that represent ways in which the world could have been, what is the Ersatzer's answer to PWQ?

One proposal would be for the Ersatzer to follow in the footsteps of our Modal Realist and claim that the abstract possible worlds are the worlds that exist and the abstract impossible worlds are the worlds that do not exist (i.e. the possible worlds are the

[26] See footnote 3 on page 7 of *On the Plurality of Worlds*.

only abstract objects). Unfortunately, this option is not available to the Ersatzer. Cameron explains, "if worlds are not concrete spacetimes [as is the case for the Modal Realists] but sets of propositions, say, then there will be sets of propositions that couldn't all be true together just as there will be sets of propositions that could all be true together, and similarly if worlds are maximal properties, or world books, etc." (Cameron, 2009, p. 12). In other words, if abstract possible worlds exist, then abstract impossible worlds also exist.[27] If the possible worlds and the impossible worlds are both abstract objects that exist, then the possible worlds and the impossible worlds are ontologically on par with one another. Hence, the Ersatzer cannot appeal to existence in her answer PWQ.

The only answer to PWQ that appears to be available to the Ersatzer is to claim that it is just a brute fact that the some worlds represent a way things could be and other worlds don't represent a way things could be. In other words, it's a brute fact that some worlds are possible worlds and other worlds are impossible worlds (Cameron, 2009, p. 12). Let me explain. Traditionally, the Ersatzer's project has been to provide a theory *describing* the abstract objects that we call "possible worlds" – not to explain the source of the necessity that makes necessary truths necessarily true. For example, a Linguistic Ersatzer describes the possible worlds as maximally consistent sets of propositions (more can be said, but that is all we need for our purposes). Notice that the Linguistic Ersatzer is appealing to a primitive modal notion – consistency – in her description of the abstract possible worlds. A maximally consistent set of propositions is a set where it is *possible*

[27] For Sider's Humean, the possible worlds and impossible worlds are not abstract objects that exist at the fundamental level. According to Sider, "the general approach is to take the Humean account as an account of some initial notion of necessity; use that initial notion to introduce abstract possible worlds and individuals; and then use those abstract possible worlds and individuals to define a further, enriched, sort of necessity" (Sider, 2011, p. 288). Abstract worlds are things that we create to talk about certain kinds of modality (e.g. *de re* modality). Hence, Humeanism is not a full-blooded Ersatzer theory.

for all of the propositions within that set to all be true together. She is using this primitive modal notion of consistency to draw a distinction between the possible worlds and the impossible worlds. Now, let's consider how the Linguistic Ersatzer would answer PWQ using her own theory of possible worlds. What do all of the possible worlds have that the impossible worlds lack that allow the former, but not the latter, to represent a way things could be? Since the possible worlds are maximal sets of propositions where it is possible for all of the propositions within those sets to all be true together, the possible worlds do have something that the impossible worlds lack – namely, in the possible worlds (i.e. the maximally consistent sets of propositions) it is *possible* for all of the propositions in each one of those sets to be true together whereas that is not the case for the impossible worlds (i.e. the inconsistent sets of propositions). But what grounds that modal fact? The Linguistic Ersatzer grounds that modal fact by appealing to a primitive notion of modality – it is simply the case that in some sets of propositions it is possible for all of the propositions in those sets to be true together and in other sets of propositions that is not possible. So it is simply the case that some sets of propositions represent a way things could be and other don't. For the Linguistic Ersatzer, then, it is simply a brute fact that some worlds are possible worlds, which represent a way things could be, and other worlds are impossible worlds, which do not represent a way things could be. Now, appealing to a primitive notion of modality is not a unique feature of Linguistic Ersatzism. As Joseph Melia, in his article "Ersatz Possible Worlds," points out, "all the ersatz theories take modality as primitive" (Melia, 2008, p.147). If all Ersatzers take modality as primitive, then it seems as though the only answer to PWQ available to the Ersatzers is to claim that it is a brute fact that the possible worlds are

worlds that represent a way things could have been and the impossible worlds are worlds that don't represent a way things could have been.

Recall that Cameron contends PWQ evokes the conception of there being a natural distinction between the possible worlds and the impossible worlds. With that in mind, many might find the Ersatzers' answer PWQ unsatisfying and uninformative. Appealing to a primitive notion of modality to answer PWQ is uninformative insofar as we wanted to know what the possible worlds *have that allows them to represent ways things could have been that the impossible worlds lack*. We want to know what this natural distinction between the possible worlds and the impossible worlds is. Being told that it is a brute fact that the possible worlds represent a way things could have been whereas the impossible worlds don't does nothing to explain what the possible worlds have that the impossible worlds lack that *allows the possible worlds to represent a way things could have been*.

Cameron's aim is to show that the Ersatzer need not worry about her seemingly uninformative answer to PWQ and he does this by developing an alternative theory of the metaphysics of modality that he calls "Neo-conventionalism". Now, as mentioned earlier, PWQ evokes the conception of there being a *natural* distinction between the possible worlds and the impossible worlds. We want to know what the possible worlds *have* that the impossible worlds lack that allows them to represent a way things could have been. But what could this natural distinction between the possible worlds and the possible worlds be for the Ersatzers? That is a very hard question to answer. As explained above, the only answer that is available to the Ersatzers using their own theories of possible worlds is that it is just a brute fact that some worlds are possible and

other worlds are not, which is an awfully uninformative answer. They could try to explain this natural distinction between the worlds by developing some other theory, but that is a daunting task. Cameron contends that the Ersatzers need not accept that it is just a brute fact that the possible worlds represent a way things could be and the impossible worlds don't, nor face the daunting task of providing a theory of the natural distinction between the possible worlds and the impossible worlds. How? According to Cameron, the Ersatzer need not hold a theory that espouses a natural distinction between the possible worlds and the impossible worlds (Cameron, 2009, p. 13). According to Cameron:

> But while the ersatzist *could* hold such a theory [that there is a natural distinction between the possible worlds and the impossible worlds], they needn't do so. More attractive, to my mind, is the thought that while there is a genuine, mind-independent, distinction between the possible worlds and the impossible worlds, it is a highly unnatural distinction: one that we latch on to with our modal vocabulary not because of any intrinsic eligibility enjoyed by the distinction between the worlds (as opposed to some other distinction: one that drew a different boundary between the worlds), but because of our interests. (Cameron, 2009, p. 13)

There are two key features of Neo-conventionalism in this passage – (i) the claim that there is a genuine, mind-independent, distinction between the possible worlds and the impossible worlds, and (ii) the claim that that distinction is an unnatural distinction – and understanding them is key to understanding the Neo-conventionalist's position. I will discuss them in that order.

First, what does Cameron mean when he says that there is genuine, mind-independent, distinction between the possible worlds and the impossible worlds? I think the best way to think about this is to envision a set W that contains all of the worlds (it's important to keep in mind that for the Ersatzers, as well as Cameron, all of the worlds in the set are abstract objects that exist). Within W there are multiple complementary subset

pairs – a complementary subset pair of W is composed of one subset containing certain worlds, which are the possible worlds, and that subset's complement, the subset containing all of the other worlds not in the first subset, which are the impossible worlds. Different complementary subset pairs of W will have different worlds in their respective subsets. For example, world w* might be in the possible world subset of one complementary subset pair of W, and w* might be in the impossible world subset of some other complementary subset pair of W. The different complementary subset pairs of W represent the various ways in which the worlds are divided up into the possible worlds and the impossible worlds in W, and this provides us with a genuine, mind-independent, distinction between the possible worlds and the impossible worlds. We do not choose which worlds are members of the subsets of any complementary subset pairs of W. They are already members. This, then, is the first important aspect of Neo-conventionalism in the passage from Cameron – there is a mind independent distinction between the possible worlds and the impossible worlds insofar as the world membership in the subsets of the complementary subset pair of W that we have latched onto is in no way determined by us.

You will have undoubtedly noticed that I have been talking about multiple complementary subset pairs of W. Why think that there are multiple complementary subset pairs of W? If there were only one complementary subset pair of W, then there would be a natural distinction between the possible worlds and the impossible worlds. Now, if that were the case, then the Ersatzer would have to either claim that it is a brute fact that certain worlds are possible worlds and other worlds are impossible worlds, or devise some other explanation for why the worlds are divided up the way that they are.

The second crucial aspect of Neo-conventionalism mentioned above – the unnatural distinction, which I will call "the non-natural distinction" – provides the Ersatzer with a way to avoid this supposed dilemma. Neo-conventionalism's primary purpose is to provide the Ersatzer with a justified, deflationary response to PWQ. Neo-conventionalism challenges the very notion of there being a natural distinction between the possible worlds and the impossible worlds. Trying to figure out what natural feature that the possible worlds have and the impossible worlds lack that allow the former, but not the latter, to represent a way the world might have been is a nonstarter for the Neo-conventionalist – there is nothing to figure out. It is simply the case that the possible worlds are possible (represent ways things could have been) and the impossible worlds are impossible (do not represent ways things could have been), and this has nothing to do with us tracking some joint in nature.

Let's take a moment to explore the Neo-conventionalist's deflationist position in more detail. According to Cameron, "the deflationist holds that there is nothing ontologically special about this distinction [between the possible worlds and the impossible worlds] as opposed to the myriad of other distinctions that we could of latched on to" (Cameron, 2009, p. 15).[28] For the Neo-conventionalist, then, there are multiple complementary subset pairs in W, all of which divide up the worlds in W differently, and we could have latched onto any one of those complementary subset pairs and used it to

[28] Sider's Humean account is also a deflationary account. Sider explains, "the spirit of Humeanism … is that the line between line between the necessary and the contingent is not discovered, but rather drawn by us – perhaps somewhat arbitrarily" (Sider, 2011, p. 289). We are not latching onto some fundamental joint in reality with our modal vocabulary. So there is nothing ontologically special about the necessary truths and, by extension, there is nothing ontologically special about the possible worlds. Why did we decide to make the mathematical and logical truths the necessary truths? For the conventionalist version Humeanism, we chose, "perhaps somewhat arbitrarily," by convention that truths of those sorts are the necessary truths.

divide the worlds into the possible worlds and the impossible worlds.[29,30] In other words, there is a non-natural distinction between the possible worlds and the impossible worlds. In "The Grounds of Necessity," Cameron employs an interesting analogy to bolster the Neo-conventionalist's deflationary response to PWQ. Any town that is in Great Britain is located either in England, in Scotland, or in Wales. So we might ask why is London in England and Glasgow in Scotland? According to Cameron, we could be asking good questions here, such as a historical question asking what historical facts led to dividing Great Britain the way we did. However, since we know where the borders between England, Scotland, and Wales are, Cameron contends that it is a confusion to ask why these certain parts of Great Britain are part of England and other parts of Great Britain are part of Scotland. We already know the answer to this question – these parts of Great Britain belong to England and those other parts of Great Britain belong to Scotland because that is where we drew the border between England and Scotland and "… there is no property of *Scottishness* had by parts of Scotland and lacked by the rest of Great

[29] When I use the phrase 'the possible worlds and the impossible worlds', I am talking about the possible worlds and the impossible worlds that we have latched onto in the actual world (as opposed to some other complementary subset pair of W that we have not latched onto). I will note when I am talking about the possible worlds and the impossible worlds that we could have latched onto (i.e. the possible and the impossible worlds from the perspective of some other possible world).

[30] How many complementary subset pairs are there in W? This could be a tricky question to answer for the Neo-conventionalist. Suppose that there were no complementary subset pairs in W where the mathematical truths were not necessary (i.e. there is no complementary subset pair in W where some mathematical proposition (e.g. the proposition that 2 + 3 = 5) is false). Now, if that were the case, then it seems like there would be a *natural* distinction between the possible worlds and the impossible worlds. Let me explain. In this scenario, we can never choose a complementary subset pair where the proposition that 2 + 3 = 5 is false at a possible world. Since we cannot choose such a complementary subset pair, then the proposition that there is no complementary subset pair where the proposition that 2 + 3 = 5 is false at some possible world is itself necessarily true. But what is the source of the necessity of that proposition? The Neo-conventionalist cannot claim that we are somehow responsible for its necessity – it is a mind independent distinction after all. Hence, if certain combinations of worlds into complementary subsets are nonexistent in W, then there is some deeper natural distinction between the possible worlds and the impossible worlds that needs to be explained. Clearly, the way to avoid this conclusion is for the Neo-conventionalist to claim every conceivable complementary subset pair is in W.

Britain that the border tracks" (Cameron, 2010b, p. 355). Likewise, we decided on which complementary subset pair of W that divides up the worlds in W into the possible worlds and the impossible worlds to latch onto and there is no natural property had by all of the possible worlds that is missing in the impossible worlds.[31]

Just because there is no *natural* explanation for the division of the worlds into the possible worlds and the impossible worlds doesn't entail there is no explanation for why these worlds are *the* possible worlds and those worlds are *the* impossible worlds. According to Cameron, "… we don't *track* the properties of being necessary or being Scottish, we determine them" (Cameron, 2010b, p. 355). How do we determine them? We determine which worlds are the possible worlds and which worlds are the impossible worlds based on our interests (Cameron, 2009, p. 14). More precisely, our interests entail that some of the truths that we accept – the mathematical, logical, and metaphysical – are true at every possible world. We therefore latch onto the complementary subset pair of W that corresponds with our interests – namely the complementary subset pair of W whose possible world subset consists of worlds in which all of these truths are true. If this is the case, then we determine the modal property of a truth being necessarily true insofar as we decide, based on our interests, to latch onto one unique complementary

[31] There is a dissimilarity between dividing up Great Britain into England, Scotland, and Wales and dividing up the worlds into the possible worlds and the impossible worlds that is worth mentioning. I would venture to say that most philosophers consider the actual world to be one of the possible worlds. So however we divide up the worlds, the actual world better fall under the category of possible worlds. For the cases to be truly analogous, it would have to be the case that no matter how we divide up Great Britain, London always falls within the territory controlled by England. In other words, there would be no scenario where London was not in England. But it is easy to imagine such a scenario. Suppose that Scotland had won certain key historical battles and decided to take London as their own. Then London would not have fallen within the borders of England. But now try to conceive some scenario where the actual world ends up in the category of impossible worlds. How would have that come about? It couldn't – there is no way to divide up the worlds in such a way that the actual world ends up in the category of impossible worlds. Hence dividing up Great Britain is not entirely analogous to dividing up the worlds into possible worlds and impossible worlds.

subset pair of W. Nevertheless, the necessary truths are necessarily true because they are true at all of the possible worlds and we have nothing to do with that fact (we don't decide which worlds fall into the complementary subset pair of W that we have latched on to).

This last point marks the important difference between Neo-conventionalism and traditional Conventionalism (i.e. Non-neo Conventionalism) that was discussed in Chapter 1. The Neo-conventionalist is *not* claiming that certain truths are *true* by convention. Conventionalists, on the other hand, do claim certain truths are true solely due to linguistic convention – these are the analytic truths. The hackneyed example of a truth that supposedly is true via linguistic conventions is the proposition that all bachelors are unmarried males.[32] According to the Conventionalist, this proposition is true simply because we have stipulated that the word 'bachelor' means 'unmarried male' or that the predicate concept 'unmarried male' is contained in the subject concept 'bachelor'. The truth of the proposition that all bachelors are unmarried males is in no way dependent on the way the world is; rather, it is determined through our conventions. For the Conventionalists, only the analytic truths are necessary;[33] hence we are the source of the necessity that makes necessary truths necessarily true.

Now, W. V. O. Quine, in "Truth by Convention," provides a formidable objection to traditional Conventionalism that I presented in Chapter 1. Recall, that according to Quine, "considered in isolation from all doctrine, including logic, a definition is

[32] If you feel that talking about propositions here is inappropriate, please substitute the analytic truth expressed in the sentence "all bachelors are single males."
[33] Recall that Alan Sidelle, in *Necessity, Essence, and Individuation: A Defense of Conventionalism*, put forward a way in which Conventionalists can account for necessary *a posteriori* truths (such as 'water is H_2O') and metaphysical necessity. His account still relies on analyticity for the necessity component of these truths.

incapable of grounding the most trivial statement …" (Quine, 1966, pp. 78 – 79). All that a convention can do is transform the truth of the proposition that all bachelors are unmarried males into the truth of the proposition that all unmarried males are unmarried males, which doesn't ground the truth of the proposition that all bachelors are unmarried males (Quine, 1936, pp. 78 – 81). As Cameron, in his article "The Grounds of Necessity," explains, the truth of the proposition that all unmarried males are unmarried males is based in how the world is, not on a convention (Cameron, 2010b, p. 354). Hence, the proposition that all bachelors are unmarried males will be true if and only if all of the bachelors in the world are in fact unmarried males. That proposition will be *necessarily* true if and only if all of the bachelors in every possible world are unmarried males.[34]

To sum up, for the Neo-conventionalist, it is not the case that all of the possible worlds have something that the impossible worlds lack that allows them represent a way the world could be (there is no natural distinction between the possible worlds and the impossible worlds that we are latching onto). Rather, it is through a convention that we decided, based on our interests, to latch onto one of the complementary subset pairs of W thereby dividing up the worlds into the possible worlds and the impossible worlds. There is really nothing special about the possible worlds other than they are the worlds where what we consider to be important truths – mathematical, logical, and metaphysical truths

[34] Here is a place where Neo-conventionalism and Humeanism most notably diverge. As explained above, the Humean claims that we label certain sorts of truths as necessary. According to Sider, "the core idea of the Humean account, then, is that necessary truths are truths of a certain more or less arbitrarily selected kinds" (Sider, 2011, p. 271). For the Humean, necessary truths aren't necessarily true because they are true at every possible world (even though they are true at every possible world); rather, we decide to label certain sorts (kinds) of truths as 'necessary' and then we introduce abstract possible worlds using those truths that we have labeled 'necessary'.

– are true. If we had different interests, we could have decided to divide the worlds differently by latching onto a different complementary subset pair of W. Ultimately, then, the Neo-conventionalist's answer to SNQ is that the necessary truths are necessarily true because they are true at every possible world and, via her deflationary answer to PWQ, we are responsible for determining which worlds are the possible worlds and which worlds are the impossible worlds insofar as we latch onto one complementary subset pair of W that corresponds to our interests as opposed to some other complementary subset pair of W that does not.[35]

2.2 The Incompleteness Argument

The crucial tenet of Neo-conventionalism is that there is a non-natural distinction between the possible worlds and the impossible worlds. This tenet is clearly paramount for making the Neo-conventionalist's deflationary response to PWQ tenable. If there is no natural distinction between the possible worlds and the impossible worlds, then there is no need to explain what the possible worlds *have* that the impossible worlds *lack* that allows the former to represent a way the world could be. It is simply the case that we have decided, based on our interests, to latch onto one particular complementary subset pair of W where these worlds are in the possible world subset and those worlds are in the

[35] There is also a non-natural distinction between the possible worlds and the impossible worlds for the Humean. We first have an initial notion of necessity, which for Sider involves true propositions of certain sorts. What sorts? Here is where convention (or some subjective/projective consideration) comes in for the Humean. We decide which "certain sorts" of propositions will be labeled 'necessary' – Sider's initial candidates are the truths of logic and mathematics. In other words, we are *not* tracking some natural joint that demarcates the logical and mathematical truths as necessary truths; rather, we choose which true propositions are necessary (Sider, 2011, pp. 269 – 270). Sider explains, "a crude Humean view, for example, would say that a proposition is necessary iff it is either a logical or mathematical truth" (Sider, 2011, p. 269). We then take our necessary mathematical and logical propositions (or whatever true propositions that we chose) and introduce abstract possible worlds where all of those propositions are true (and possibly introduce impossible worlds where they are false) (Sider, 2011, p. 288). In this way, there is a non-natural distinction between the possible worlds and the impossible worlds for the Humean.

impossible world subset. There is nothing more to say about why these worlds are *the* possible worlds and those worlds are *the* impossible worlds other than maybe explaining why we have the interests that we have, which is a job for the psychologists.

In light of the Neo-conventionalist's reliance on the non-natural distinction between the possible worlds and the impossible worlds to provide her with a basis for her deflationary response to PWQ, I propose that we consider the modal status of the following proposition:

> **NO-NATURAL:** There is no natural distinction (one that cuts nature at the joints) between the possible world and the impossible worlds.

Now, NO-NATURAL is either contingently true or necessarily true. In what follows, I am going to argue that the Neo-conventionalist must claim that NO-NATURAL is necessarily true. I will then show that the Neo-conventionalist cannot provide us with an accurate account of the source of NO-NATURAL necessity using her own theory.

2.2.1 The Necessity of NO-NATURAL

To show that the Neo-conventionalist must claim that NO-NATURAL is necessarily true, let's suppose for *reductio* that NO-NATURAL is only contingently true. If NO-NATURAL is only contingently true, then there is a possible world where it's false. Let's call the possible world where NO-NATURAL is false "w^N". Recall that Cameron argues that the truth of any proposition is *not* based in conventions; rather, the truth of any proposition is based on the way the world under consideration actually is (this is his argument against Conventionalism). In w^N, then, it must be the case that there is a natural distinction between the possible worlds and the impossible worlds in order for NO-NATURAL to be false at w^N. If there is a natural distinction between the possible worlds and the impossible worlds at w^N (where NO-NATURAL is false), then this

natural distinction between the possible worlds and the impossible worlds would explain the division of the worlds in W into *the* possible worlds and *the* impossible worlds at *every* world in the complementary subset pair of W that we have latched onto. Let me explain.

We are supposing that NO-NATURAL is contingently true. In order for NO-NATURAL to be contingently true, there must a natural distinction between the possible worlds and the impossible worlds at some possible world – in our case it is world w^N. For the Neo-conventionalist's claim that there is no natural distinction between the possible worlds and the impossible worlds to be true, it must be the case that there is *no* natural distinction between the possible worlds and the impossible worlds at the actual world, "$w^@$". If there is no natural distinction between the possible worlds and the impossible worlds at $w^@$, then the Neo-conventionalist's claim that we choose, based on our interests, which of the many complementary subset pairs of W divides up the worlds into the possible worlds and the impossible worlds is coherent.

Now, we need to discuss how the possible worlds are related to one another in the model. If we decided, based on our interests, which complementary subset pair of W divides up the worlds into the possible worlds and the impossible worlds, then one of our principled reasons for choosing the complementary subset pair of W that we actually chose must have been to track the logical and mathematical truths, which are all necessary. The modal logic system S5 is widely regarded to be the correct modal system for representing (modeling) mathematical necessity, logical necessity, and, more

controversially, metaphysical necessity.[36] Typically, Kripkean models are used for modeling the semantics of modal logic systems. These models are composed out of (i) a frame (which consists of (a) a nonempty set of possible worlds, (b) a binary relation between the possible worlds (we loosely speak of which worlds can "see" which worlds in the frame), and (c) a constant or varying domain of objects), and (ii) a "true at" relation between possible worlds and propositions. In the S5 model, the frame of the model consists of an accessibility relation between the possible worlds that is reflexive, symmetric, and transitive. For our model of the necessary mathematical, logical, and metaphysical truths, then, we will use a S5 frame, which, loosely speaking, means that every possible world in the frame (including the actual world, $w^{@}$) can "see" every other possible world in the frame.[37]

For the possible worlds to be possible at w^{N} (recall that we are supposing that NO-NATURAL is contingently true and we have stipulated that w^{N} is a possible world from the vantage point of $w^{@}$ where NO-NATURAL is false), the possible worlds must have something that the impossible worlds lack – after all, there is a natural distinction between the possible worlds and the impossible worlds at w^{N}. Let's call that something that the possible worlds have and the impossible worlds lack "X". From the vantage

[36] Even if it is not the case that S5 is the correct modal system for modeling these truths, let's suppose that it is for now. The reason why I am using it here is that I think it is easier to conceptualize how this objection to Neo-conventionalism works using NO-NATUAL and S5. In what follows, I will show that my argument is not dependent on assuming that S5 is the correct modal system for modeling the these truths by considering the modal status of a more complicated proposition that in part expresses S5 is not the correct modal system for modal.

[37] Worlds that can "see" one another are considered possible worlds from the perspective of the world under consideration. For example, if world w^{1} can "see" world w^{2} but w^{2} cannot "see" w^{1}, then w^{2} is a possible world from the perspective of w^{1} but w^{1} is not a possible world from the perspective of w^{2}. In the S5 frame every world can "see" every other world, so every world in the domain of the frame is a possible world under any perspective.

point of w^N, then, every possible world that w^N can "see" (i.e. every possible world in the domain) has X. Since every possible world can "see" every other possible world in a S5 frame and $w^@$ is a possible world in the frame under consideration, $w^@$ has X. Furthermore, from the vantage point of $w^@$, every possible world that it can "see" has X (including itself – the frame is reflexive). Why? If there were some possible world that $w^@$ could "see" but w^N couldn't "see", then the frame would not be a S5 frame. So, there is a natural distinction between the possible worlds and the impossible worlds at $w^@$ insofar as every possible world has X.[38] Contradiction! Our assumption was that there was no natural distinction between the possible worlds and the impossible worlds at $w^@$. Hence, either (i) it is impossible for there to be a natural distinction between the possible worlds and the impossible worlds at w^N (or any other possible world that $w^@$ can "see") thereby making NO-NATURAL necessarily true, or (ii) there is a natural distinction between the possible worlds and the impossible worlds at $w^@$ thereby making NO-NATURAL false at $w^@$, which means that the Neo-conventionalist's claim that there is no natural distinction between the possible worlds and the impossible worlds is incorrect. Clearly the Neo-conventionalist cannot accept (ii), her account of the source of necessity

[38] There is another way of picturing the problem with NO-NATRUAL being contingently true. Let's suppose that all of the possible worlds that w^N can "see" have a special glow – this special glow is the natural distinction that makes a possible world possible from the perspective of $w^{N\text{-}N}$ (Cameron talks of possible worlds having a "special glow" in natural accounts in "What's Metaphysical About Metaphysical Necessity" – he denies that the possible worlds have a special glow). In other words, any world that is not glowing is not a possible world from the perspective w^N. Now, w^N is itself glowing insofar as the S5 frame is reflexive, which means that w^N can "see" itself. It is also the case that w^N can "see" every other possible world, including the actual world $w^@$, due to the fact that the S5 frame is also symmetric and transitive. Since there is a natural distinction between the possible worlds and impossible worlds at w^N and w^N can "see" every other possible world, every other possible world must also be glowing. Hence, every possible world in the S5 frame can "see" every other possible world and every possible world is glowing. This means that from the perspective of any possible world, including from the perspective of $w^@$, every other possible world, including $w^@$, will be glowing. Therefore, there is a natural distinction between the possible and impossible worlds at every possible world because every possible world, including $w^@$, can see every other possible world and every possible world, including $w^@$, is glowing.

depends on (ii) being false. Hence, the Neo-conventionalist must claim that it is impossible for there to be a natural distinction between the possible worlds and the impossible worlds at w^N (or any other world that $w^@$ can "see"). If that is the case, then there is no possible world where NO-NATURAL is false, which contradicts our original assumption that NO-NATURAL is only contingently true. Therefore, the Neo-conventionalist must claim that NO-NATURAL is necessarily true.

2.2.2 The Source of NO-NATURAL's Necessity

Now that I have established that the Neo-conventionalist must claim that NO-NATURAL is necessarily true, we can consider whether the Neo-conventionalist can account for the source of NO-NATURAL's necessity within her own system. I begin by providing the Neo-conventionalist's account of the source of NO-NATURAL's necessity. Next, I show that NO-NATURAL's necessity is grounded in a restriction on the complementary subset pairs of W. Lastly, I argue that the Neo-conventionalist cannot provide us with an accurate account of NO-NATURAL's necessity using her own system.

For the Neo-conventionalist, if NO-NATURAL is necessarily true, then it is true at all of the possible worlds in the complementary subset pair of W that we have latched onto based on our interests. Now, what is the source of the necessity that makes NO-NATURAL necessarily true according to the Neo-conventionalist? Recall that the Neo-conventionalist's contention that SNQ (i.e. What is the source of necessity that makes necessary truths necessarily true?) boils down to PWQ (i.e. What do all the possible worlds have that the impossible worlds lack that allow the former, but not the latter, to represent a way things could be?). To discover the source of the necessity that makes NO-NATURAL necessarily true, then, we simply need to consider the Neo-

conventionalist's deflationary answer PWQ. The Neo-conventionalist's deflationary answer to PWQ is that the possible worlds do not have anything that the impossible worlds lack (there is no natural distinction between the possible worlds and the impossible worlds) that allow the former, but not the latter, to represent a way things could have been. Rather, we have latched onto this particular complementary subset pair of W because the truths that we consider to be important (the logical, mathematical, and metaphysical truths) are true at all of the worlds in the possible world subset of that complementary subset pair of W. If this is the case, then the Neo-conventionalist's account of NO-NATURAL's necessity will be: NO-NATURAL is necessarily true because we chose to latch onto this particular complementary subset pair of W where NO-NATURAL is true at all of the possible worlds based on our interests.

Let's now take a closer look at what NO-NATURAL expresses. NO-NATURAL is expressing a constraint on how the worlds in W are divided into complementary subset pairs – there is no complementary subset pair in W where there is a natural distinction between the possible worlds and the impossible worlds, and this is necessarily the case. For the Neo-conventionalist, it must be the case that NO-NATURAL is true at every world that is capable of being a member of some possible world subset of a complementary subset pair of W (thereby making those worlds possible possible worlds), and it must be the case that worlds where NO-NATURAL is false are impossible worlds in every complementary subset pair of W (thereby making those worlds impossible possible worlds). This means that there is no complementary subset pair of W that we can decide to latch onto where NO-NATURAL is false at a possible world (if there were, then NO-NATURAL would be contingently true, which was shown to be problematic

above) even if our interests dictate that NO-NATURAL ought to be only contingently true. Hence, there is a restriction on the complementary subset pairs of W. This restriction has two components – namely, (i) there is a necessary (but not sufficient) condition on the worlds in W that can serve as possible worlds in every complementary subset pair of W (namely, NO-NATURAL is true at all of those worlds) that allows those worlds to represent a way things could have been, and (ii) any world where NO-NATURAL is false is an impossible world in every complementary subset pair of W. This restriction cuts the worlds in W at the joint. If the worlds in W are cut at the joint, then nature is cut at the joint – there is a natural distinction between the worlds in W that can serve as possible worlds in some complementary subset of W and the worlds in W that must be impossible worlds in every complementary subset of W.

Is this natural distinction between the worlds in W that can serve as possible worlds and the worlds in W that must be impossible worlds problematic for the Neo-conventionalist's claim that there is no natural distinction between the possible worlds and the impossible worlds? In other words, does the natural restriction on worlds in W entail that there is a natural distinction between the possible worlds and the impossible worlds? No. The natural distinction between the worlds in W that can serve as possible worlds and the worlds in W that must be impossible worlds is not problematic for the Neo-conventionalist's claim that there is no natural distinction between the possible worlds and the impossible worlds. For there to be a natural distinction between the possible worlds and the impossible worlds, the possible worlds must all have something (e.g. X) that the impossible worlds lack that allows them to represent a way things could be. It is true that NO-NATURAL must be true at all of *the* possible worlds (component

(i) of the restriction on the worlds in W) and any world where NO-NATURAL is false must be an impossible world (component (ii) of the restriction on the worlds in W); however, it is not the case that NO-NATURAL has to be false at all *the* impossible worlds. There certainly could be an impossible world where NO-NATURAL is true. If that were the case, and it certainly seems plausible that it could be the case, then the possible worlds do not have something that the impossible worlds lack that allow them to represent a way things could be.

Nevertheless, this natural distinction between the worlds in W that can serve as possible worlds and the worlds in W that must be impossible worlds is problematic for the Neo-conventionalist. According to the Neo-conventionalist, we are ultimately the source of the necessity that makes *the* necessary truths necessarily true. We are the ones with the interests who decide which complementary subset of W to latch onto. However, no matter which complementary subset pair of W that we latch onto, NO-NATURAL will be true at all of the possible worlds in that complementary subset pair of W. If there is no complementary subset pair of W where NO-NATURAL is false at a possible world, then the necessity of NO-NATURAL is rooted in this restriction on the complementary subset pairs of W and not in some convention for choosing which of the many complementary subset pairs of W to latch onto based on our interests. In other words, the natural distinction between the worlds in W that can serve as possible worlds and the worlds in W that must be impossible worlds is the source of NO-NATURAL's necessity. This shows that the Neo-conventionalist's account of the source of the necessity that makes necessary truths necessarily true is at best an incomplete account. It does not provide us with an account of the source of the necessity of all necessary truths.

Is the natural source of NO-NATURAL's necessity really that problematic for the Neo-conventionalist? I think that there are two good, related reasons for thinking that it is. (1) If Neo-conventionalism is correct, then the natural source of NO-NATURAL's necessity calls into doubt Cameron's claim that the question of the source of necessity (SNQ) boils down to a question about possible worlds (PWQ), at least when it comes to considering NO-NATURAL necessity. The source of NO-NATURAL's necessity is *not* rooted in a natural distinction between the possible worlds and the impossible worlds, and it is *not* rooted in a non-natural distinction between the possible worlds and the impossible worlds (i.e. us latching onto some complementary subset pair of W based on our interests); rather, it is rooted in a natural distinction between the worlds in set W. If NO-NATRUAL's necessity is rooted in a natural distinction between the worlds in set W, then no deflationary answer to PWQ that explains how we latch onto a complementary subset pair of W will give us insight into the source of NO-NATURAL's necessity (i.e. answering PWQ will not provide us with an answer to SNQ in the case of NO-NATURAL). This means that the Neo-conventionalist will be unable to provide us with an account of NO-NATURAL's necessity within her own system, which is dependent on SNQ boiling down to PWQ. (2) Why is the source of NO-NATURAL's necessity so different than the source of the necessity of (presumably) all other necessary truths within the Neo-conventionalist system? This is a question that needs to be answered. NO-NATURAL is, after all, a key component of the Neo-conventionalist's account of the

source of the necessity that makes necessary truths necessarily true and the demand for an explanation of its uniqueness is warranted.[39]

2.2.3 A Possible Response to the Incompleteness Argument and a Reply to that Response

One response to the Incompleteness Argument that is available to the Neo-conventionalist is to claim that the S5 modal system is the wrong modal system to use when considering (modeling) the necessary mathematical, logical, and metaphysical truths, and that NO-NATURAL is contingently true. The Neo-conventionalist could claim that the correct modal system for modeling those truths should be a modal system where it is not the case that every possible world in the domain of the frame can "see" every other possible world. There are many different modal systems where all the possible worlds in the domain of the frame don't all "see" one another. As it turns out, the Neo-conventionalist only needs to adopt the slightly weaker modal system S4 to build such a model.[40]

If the Neo-conventionalist adopts a slightly weaker modal system like S4, where it is not the case every possible world in the domain of the frame can "see" every other possible world in the domain of the frame at $w^{@}$, then the Incompleteness Argument, as

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[39] We have to take a slightly different approach with the Incompleteness Argument to show that the *conventionalist* version of Humeanism does not provide us with an account of the source of the necessity for all necessary truths. I will develop an Incompleteness Objection to Conventionalist Humeanism in Chapter 3.

[40] In the S4 system, the accessibility relationship between all the possible worlds in the domain of the frame is reflexive and transitive. To show that all of the possible worlds in the domain of a S4 frame cannot "see" one another, consider the simple model that contains only two possible worlds, w^1 and w^2, in the domain of the frame. Let's suppose that w^1 can "see" itself and "see" w^2, and that w^2 can only "see" itself. This is a perfectly legitimate S4 model. The only requirements are that accessibility relation is reflexive and transitive, and this model fulfills both requirements. The model is reflexive insofar as w^1 can "see" itself and w^2 can "see" itself. The model is transitive insofar as w^1 can "see" itself and w^1 can "see" w^2, so w^1 can "see" w^2, which it does. The accessibility relation for S4 does not require symmetry, so it is perfectly acceptable that w^2 cannot "see" w^1.

given, is no longer problematic for the Neo-conventionalist. To show that this is the case, suppose that the actual world ($w^{@}$) can "see" the possible world where NO-NATURAL is false (w^{N}); yet, w^{N} cannot "see" $w^{@}$. Then NO-NATURAL is contingently true (there is a possible world, w^{N}, that $w^{@}$ can "see" where NO-NATURAL is false from the perspective of $w^{@}$). In other words, there is a possible world accessible from $w^{@}$ where there is a natural distinction between the possible worlds and the impossible worlds – w^{N} is such a possible world. Nevertheless, there is no natural distinction between the possible worlds and the impossible worlds at $w^{@}$. The only way the Incompleteness Argument will be problematic for the Neo-conventionalist is if (1) there is a natural distinction between the possible worlds and the impossible worlds at every possible world that w^{N} can "see", and (2) w^{N} can "see" $w^{@}$. Since w^{N} cannot "see" $w^{@}$, $w^{@}$ is not a possible world from the perspective of w^{N} and it is perfectly reasonable to think that there is a natural distinction between the possible worlds and the impossible worlds at every possible world that w^{N} can "see"; yet, it not being the case that there is a natural distinction between *the* possible worlds and *the* impossible worlds at $w^{@}$. The Neo-conventionalist can therefore avoid the objection raised in the Incompleteness Argument by adopting a slight weaker modal system.

This response to the Incompleteness Argument ultimately fails. For the response to work, it has to be the case that we cannot model the necessary mathematical, logical, and metaphysical truths using the S5 modal system. In what follows, I will show that we can take the Neo-conventionalist's response to the original version of the Incompleteness Argument and build another proposition to use in the Incompleteness Argument that turns out to be equally problematic for the Neo-conventionalist. In other words, I will show

that even if we accept the Neo-conventionalist's claim that the correct modal system for modeling the necessary mathematical, logical, and metaphysical truths is a modal system that is weaker than S5, the Incompleteness Argument is still problematic for the Neo-conventionalist thesis.

Let's begin by examining the Neo-conventionalist's response to the Incompleteness Argument. In her response, the Neo-conventionalist is claiming that (i) NO-NATURAL is contingently true, and (ii) S5 is the wrong modal system to model the necessary mathematical, logical, and metaphysical truths, which means S5 is the wrong modal system to model the relationship between the possible worlds in the complementary subset pair of W *that we have latched onto*. Now, let's examine the modal status of the following proposition that expresses a thought associate with (ii) (call the proposition that expresses that thought "NO-S5").

> **NO-S5:** No world where S5 is the correct model for modeling the relationship between the worlds in the complementary subset pair of W that we have latched onto is a world that can "see" the actual world.

It turns out that NO-S5 must be necessarily true. Suppose for *reductio* that (i) NO-NATURAL is contingently true[41], and (ii) NO-S5 is contingently true – i.e. it is false at some possible world (call that world "w^{S5}") in the complementary subset pair of W that we have latched onto. If NO-S5 is false at w^{S5}, then S5 is the correct modal system to model the relationship between the worlds in the possible world subset of W that we have latched onto from the perspective of w^{S5} and w^{S5} can "see" the actual world $w^{@}$: This

[41] Why should the Neo-conventionalist tolerate there being a possible world where NO-NATURAL is false in this complementary subset pair of W? The reason why the Neo-conventionalist must grant that NO-NATURAL is false at some possible world is due to her response to the Incompleteness Argument – NO-NATURAL is only contingently true.

means that every world in the possible world subset of the complementary subset pair of W that we have latched onto in $w^{@}$ that $w^{@}$ can "see" is a world that w^{S5} can "see". Now, in that complementary subset pair of W that we have latched onto, there is a possible world where NON-NATRUAL is false, w^{N}. This means that the possible worlds have something (let's call that something "X" again) that the impossible worlds lack in complementary subset pair of W that we have latched onto. Now, if every possible world can "see" every other possible world in the complementary subset pair of W that we have latched onto from the perspective of w^{S5} and w^{S5} can "see" both $w^{@}$ and w^{N} (due to transitivity and symmetry), then $w^{@}$ and w^{N} can "see" each other from the perspective of w^{S5}. Since there is a natural distinction between the possible worlds and the impossible worlds at w^{N} (i.e. w^{N} has X) and w^{N} can "see" $w^{@}$ from the perspective of w^{S5}, there is a natural distinction between the possible worlds and the impossible worlds at $w^{@}$ ($w^{@}$ has X) and every other possible world in the complementary subset pair of W that we have latched onto that $w^{@}$ can "see" (even if the correct modal system for modeling relations between the possible worlds from the perspective of $w^{@}$ is weaker than S5). If there is a natural distinction between the possible worlds and the impossible worlds at $w^{@}$ (every possible world that $w^{@}$ can "see" has X from the perspective of $w^{@}$) in the complementary subset pair that we have latched onto, then NO-NATURAL is false. This contradicts our supposition that NO-NATURAL is contingently true. Hence, the Neo-conventionalist must claim that NO-S5 is necessarily true in the complementary subset pair of W that we have latched onto for her response to the original version of the Incompleteness Argument to work. Furthermore, NO-S5 must be necessarily true in any complementary subset pair of W that we could latch onto (if it were contingent in some

complementary subset pair of w, then we could latch onto that complementary subset pair of W where it is false and we would have the same problem).

Let's now take a closer look at what NO-S5 is expressing. NO-S5 is expressing a constraint on the complementary subset pairs of W that we can latch onto. NO-S5 must be true at all of the possible worlds in every complementary subset that we can latch onto. If there is no complementary subset pair of W with a world w* where S5 is the correct model and w* can see $w^{@}$ S5 that we can latch onto, then we are not the source of NO-S5's necessity – it is not rooted in our choosing which complementary subset pair of W to latch onto based on our interests. The source of NO-S5's necessity is a restriction on the complementary subset pairs of W that we can latch onto, which delineates a natural distinction between the worlds in W that can serve as possible worlds and the worlds that must be impossible worlds in every complementary subsets of W that we can latch onto. This restriction has two components (similar to the restriction for NO-NATURAL in the Incompleteness Argument): (i) NO-S5 must be true at every possible world in every complementary subset pair of W that we can latch onto; and (ii) any world in any complementary subset pair of W that we can latch onto where NO-S5 is false is an impossible world. As was the case in the original Incompleteness Argument, this natural distinction between the worlds in W does not threaten the Neo-conventionalist's claim that there is no natural distinction between the possible worlds and the impossible worlds insofar as component (i) of the restriction is only a necessary condition (there could be an impossible world in one of the complementary subset pairs of W that we latch onto where NO-S5 is true). Nevertheless, we are left with the same two concerns that were raised at the end of the original Incompleteness Argument. (1) If Neo-conventionalism is correct,

then the natural source of NO-S5's necessity calls into doubt Cameron's claim that the question of the source of necessity (SNQ) boils down to a question about possible worlds (PWQ), at least when it comes to considering NO-S5's necessity. On the one hand, the possible worlds don't have anything that the impossible worlds lack (NO-S5 can be true at an impossible world), which rules out a natural distinction between the possible worlds and the impossible worlds as the source of NO-S5's necessity. On the other hand, NO-S5's necessity is not rooted in our latching onto a particular complementary subset of W where NO-S5 is necessarily true based on our interests (a non-natural explanation of NO-S5's necessity). NO-S5's necessity is rooted in a restriction on the complementary subsets of W. Since SNQ doesn't boil down to PWQ in the case of NO-S5, the Neo-conventionalist will not be able to account for NO-S5's necessity within her own system (which is dependent on SNQ boiling down to PWQ). (2) Why is the source of NO-S5's necessity so different than the source of the necessity of (presumably) all other necessary truths within the Neo-conventionalist system? Once again, this is a question that needs to be answered. NO-S5 is, after all, a key component for making the Neo-conventionalist's account of the source of necessity tenable and the demand for an explanation of its uniqueness is warranted.

2.3 The Stroud Argument

Let's suppose that there are multiple complementary subset pairs of W and that we latch onto one of those complementary subset pairs of W based on our interests. What exactly are we doing? Recall, Cameron contends, "… we don't *track* the properties of being necessary or being Scottish, we determine them" (Cameron, 2010b, p. 355). We do this by determining which worlds are *the* possible worlds and which worlds are *the*

impossible worlds based on our interests. We could have latched onto a different complementary subset pair of W if our interests were different, and if that were the case, then we would have different possible worlds and impossible worlds. In this section I am going to develop an objection to this aspect of Neo-conventionalism – us determining which worlds are *the* possible worlds and which worlds are *the* impossible worlds based on our interests – by appropriating an argument form Barry Stroud's article "Wittgenstein and Logical Necessity." In that article Stroud argues against the claim that Ludwig Wittgenstein's account of logical necessity is a Conventionalist account. Even though Stroud is dealing with Conventionalist notions of necessity as applied to the work of Wittgenstein, many of the conclusions he draws are equally applicable to the Neo-conventionalist thesis.

Throughout Wittgenstein's work there are many examples of different ways people could have been. One of his famous examples involves a student who begins a series with '2, 4, 6, …' until she reaches 1000, then she goes on '1000, 1004, 1008, 1012, …' (Wittgenstein, 2009, §185). In this example, the student believes that she is carrying on in the same way. "Or, to choose another example," explains Stroud, "suppose we came across some people who find it natural to sell wood, not by cubic measurement or board feet as we do, but at a price proportionate to the area covered by the pile of wood, and they pay no attention to the height of the pile" (Stroud, 2000, p. 6). Each of these examples seems to show a possible way things could have been done. Wittgenstein utilizes these and other examples to show that these alternative ways of doing things do not cause logical contradictions. There is no logical contradiction in the series '…, 996, 998, 1000, 1004, 1008, …' that the student is carrying out. The student is adhering to

some mathematical function – add 2 to each number until you reach 1000 and from that point on add 4 to each number. Likewise, there is no logical contradiction in the way the wood sellers are selling their wood. That is their preferred way to sell wood and we are not in a position to tell them that it is the wrong way to sell wood (Stroud, 2000, pp. 3 – 7).

Nevertheless, we do feel compelled to say that the student is not carrying on in the same way and the wood sellers' way of selling wood is incorrect. Supposedly, the Conventionalist can explain these phenomena. The reason why the student is not continuing on in the same way is that we have adopted a convention that the series will continue after 1000 by adding 2 to each number – '…, 1000, 1002, 1004, …'. We have adopted another convention to sell a piece of wood based on all of the dimensions of that piece of wood – length, width, *and* height. The Conventionalist is not claiming that there is some logical contradiction involved with the alternative ways of continuing the series or selling wood. Rather, the Conventionalist is claiming that the alternatives are incorrect because we have adopted certain conventions and these alternative ways of doing things do not adhere to those conventions. When the student continues the series by adding 4 after she reaches 1000, she is incorrect insofar as she is no longer following our adopted convention to continue adding 2 to each number. When the wood sellers sell their wood by the area the wood covers and do not take in to consideration the height of the pile, then they are incorrect because they are not following our adopted convention to take all the dimensions of the pile into consideration (Stroud, 2000, p. 6 – 7).

According to Stroud, one thing that is implied by the term 'convention' is that there are viable alternatives that we could have chosen.[42] Is the alternative continuation of the mathematical series a viable alternative? Is the alternative way of selling wood a viable alternative? Stroud's answer to both of these questions is 'No' – neither of these alternatives is viable (Stroud, 2000, p. 7). Stroud claims that these alternatives only seem viable when they are viewed in isolation and when we take into consideration the effects that these alternatives would have on the whole world, the alternative become unintelligible. Stroud explains:

> The reason for this progressive decrease in intelligibility, I think, is that the attempt to get a clearer understanding of what it would be like to be one of these people and live in their world inevitably leads us to abandon more and more of our own familiar world and the ways of thinking about it upon which our understanding rests. The more successful we are in projecting ourselves into such a world, the less we will have left in terms of which we can find intelligible. (Stroud, 2000, p. 10).

The unintelligibility of the alternative way of continuing the series of numbers or selling wood is not due to some logical contradiction. The unintelligibility of these alternatives is due to the way we are. We find it natural to continue the series of numbers in certain way (keep adding 2), and we also find it natural to take into account all of the dimensions of a piece of wood (length, width, and height) when selling that piece of wood. When we try to think about how worlds where either the alternative way of continuing the series of numbers or the alternative way of selling wood *are as a whole*, those worlds are unintelligible to us.

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[42] Sider makes a similar point. According to Sider, "… 'conventional' seems most apt when the arbitrary choice is made more or less consciously, when alternative choices stare us in the face, and when those choices accomplish *exactly* the same goal; it seems less apt when the choice has been made implicitly and collectively, over time, when no one thinks much about the alternatives, and when the alternative accomplish slightly different semantic goals" (Sider, 2011, p. 56).

Take for example the world where the alternative way of continuing the mathematical series is the adopted convention. Suppose a person in that world is demonstrating the alternative way of continuing the mathematical series by tracking the number of human ears that are in a line (to avoid being grotesque, we will stipulate that the ears are still attached to the humans that they belong to). She begins by placing one person in the line she is forming, so there are two ears in the line. She then proceeds to put another person in the line so that there are four ears in the line. She continues grabbing one person at a time and putting that person into the line until there are 1000 ears in the line, which means that there are now 500 people in the line. At this point, instead of grabbing one person and putting that person into the line, she grabs two people and puts both of them into the line. By doing this she is able to continue the alternative series insofar as there are now 1004 ears in the line (502 people). She then grabs two more people and puts them in the line, which means there are 1008 ears in the line (504 people).

Is she continuing on in the same way? Intuitively, she is doing something different. She started out grabbing one person at a time and putting that person into the line. She ended up grabbing two people at the same time and putting both of them into the line. How could she be continuing on in the same way throughout the demonstration when she clearly changes her procedure? Grabbing one person and putting that person into the line is clearly different than grabbing two people and putting them into the line! Yet, if we consider the alternative mathematical function that she is demonstrating, she is not doing something different. Throughout the demonstration she is steadfastly adhering to the alternative way of continuing the mathematical series. She is following the same

procedure. In order to demonstrate the alternative way of continuing the series, then, it appears to us that she must change what she is doing so that she can demonstrate that she is not changing what she is doing. If this constitutes carrying on in the same way in this world, then this world is unintelligible to us.

There are similar problems with the alternative way of selling wood. Stroud explains that we cannot get a clear understanding of what it would be like to live in a world where wood is sold at a price based on the amount of ground it covered. He questions what the relationship between quantity and weight would be like for the inhabitants of that world. According to Stroud, in the world where wood is sold at a price based on the amount of ground it covers "a man could buy as much wood as he could possibly lift, only to find, upon dropping it, that he had just lifted more wood than he could possibly lift" (Stroud, 2000, p. 9). Suppose that John, an inhabitant of the world with the alternative way of selling wood, goes to the lumberyard to buy as much wood as he can possibly lift. John gives the attendant at the lumberyard his credit card, so that he can pay for the wood, and asks her to stack wood in his outstretched arms until he can't hold anymore wood. The attendant manages to stack $20 worth of wood in John's arms before he asks her to stop. Hence, John can only lift a pile of wood that is worth $20. After the attendant runs his credit card for $20, John haphazardly drops the wood that she staked in his arms on the ground. The pile of wood that John dropped on the ground is now worth $40 (keeping in mind that the cost of wood in this world is based on the amount of ground that it covers). So John lifted a pile of wood that is worth $40. Yet, John can't lift $40 worth of wood – he can only lift $20 worth of wood. If John were able to lift a stack of wood worth $40, then he would have bought a stack of wood worth

$40. Therefore, John has bought as much wood as he could possibly lift only to find out that, upon dropping it, he had lifted more wood than he could possibly lift.[43] This seems absurd. Stroud then introduces an alternative description of the situation – the weight stays the same but the quantity increases (Stroud, 2000, p. 9). In our example, then, maybe the pile of wood that is on the ground weighs the same as the pile of wood in John's arms, but there is just more of it when it's strewn across the ground. This description seems equally absurd. How can you have a larger quantity of wood that weighs the same amount as a smaller quantity of wood of the same type?

Hence, these alternatives only seem viable when we consider them in isolation; however, when we consider what it would be like to live in one of those worlds, these alternatives become unintelligible. Therefore, it cannot be the case that these truths are true because we adopted some convention. To adopt a convention means that there were viable alternative conventions that we could have decided to adopt, which is not the case.

This line of reasoning works equally well against the Neo-conventionalist position. Recall that the Neo-conventionalist claims that we latched onto some complementary subset pair of W thereby determining which worlds are *the* possible worlds and worlds are *the* impossible worlds based on our interests. We could have decided – presumably based on principled reasons – to latch onto some other complementary subset pair of W thereby making a different set of worlds *the* possible worlds and a different set of worlds *the* impossible worlds. Do we really get to decide which worlds are *the* possible worlds and which worlds are *the* impossible worlds? The

[43] I am grateful for Peter Hanks' help with these examples – any remaining confusions with these examples are mine.

answer is no. According to Stroud, "part of human behaviour consists in calculating sums, distances, quantities, of making inferences, drawing conclusions, and so forth" (Stroud, 2000, p. 12). If calculating sums is a human behavior, could we latch onto to some complementary subset pair of W where the proposition that 2 + 3 = 7 is true in one of *the* possible worlds? If making inferences is part of human behavior, could we latch onto some complementary subset pair of W where denying the antecedent is not a fallacy in one of *the* possible worlds? The answer to both of these questions is no.

First, it is hard to see how we would have, or even could have, any principled reasons for adopting either of these alternative complementary subset pairs of W. Our principled reasons for latching onto one particular complementary subset pair of W is part of our human behavior – these principled reasons are based on the way we approach the actual world. If there are no principled reasons for choosing a complementary subset pair of W where either the proposition that 2 + 3 = 7 true at some possible world or denying the antecedent is a valid form of inference at some possible world, then these are not complementary subset pairs of W that we could latch onto. This result will hold for any necessary truth we consider. If this is the case, then we, being the way we are, don't have a choice about which complementary subset pair of W that we latch onto when it comes down to the necessary truths. If that is the case, then we don't determine which worlds are *the* possible worlds and which worlds are *the* impossible worlds.

Second, for it to be the case that we have a choice about which of the complementary subset pairs of W that we latch onto, it must be the case that the alternative complementary subset pairs that we didn't choose, but could have chosen, are intelligible to us (i.e. make sense to us). This would make them viable alternatives. Let's

consider whether some complementary subset pair of W where the proposition that 2 + 3 = 5 is false and the proposition that 2 + 3 = 7 is true in one of its possible worlds is a viable alternative to the one that we actually latched onto. Let's begin by trying to imagine how that world would be as a whole. Suppose that we are in that world and someone instructs me to raise my right hand, extend two fingers, and tuck the other three fingers away in that world. Next, she instructs me to extend the three fingers on my right hand that were tucked away. Since the proposition that 2 + 3 = 7 is true in that world, I am now holding up seven fingers on my right hand. I would then be holding up more fingers than I have on my right hand, which is clearly unintelligible. Maybe by making the proposition that 2 + 3 = 7 true in the example, we have inadvertently also changed the act of holding up fingers in that world so that when I first extend two fingers and then extend the other three, I automatically extend two more fingers so that I am holding up seven fingers – that is just how the act of holding up fingers works in that world. What happens if I only have one hand? Then I would not be performing the act of holding up fingers, since I do not have two additional fingers to extend. Yet, clearly I am holding up the fingers I do have. I am performing an act I cannot perform, which is unintelligible. Hence, either way, a world where the proposition that 2 + 3 = 7 is true is an unintelligible world. How, then, is that complementary subset pair of W with that world in its possible world subset a viable alternative? If the proposition that 2 + 3 = 7 is true in some possible world in one of the complementary subset pairs of W, then that is a complementary subset pair that we cannot latch onto. Hence, once again, we, being the way we are, don't have a choice about which complementary subset pair of W that we latch onto when it comes down to this necessary mathematical truth (or any other

necessary mathematical, logical, or metaphysical truth for that matter). If we don't have a choice about which complementary subset pair that we latch onto when it comes down to the necessary mathematical, logical, or metaphysical truths because all of the alternatives are unintelligible to us, then once again, we, being the way we are, don't decide which worlds are *the* possible worlds and which worlds are *the* impossible worlds.[44]

2.4 Conclusion

According to Cameron, the question of the source of necessity (SNQ) boils down to a question about possible worlds – (PWQ) What do all the possible worlds have that the impossible worlds lack that allow the former, but not the latter, to represent a way things could have been? He claims that PWQ evokes the conception of there being a natural distinction between the possible worlds and the impossible worlds. Neo-conventionalism supposedly provides us with an informative, deflationary answer to PWQ. According to the Neo-conventionalist, the possible worlds don't have anything that the impossible worlds lack (there is no natural distinction); rather, we have determined, based on our interest, which worlds are *the* possible worlds and which worlds are *the* impossible worlds by latching onto one of many complementary subset pairs the set of all worlds, W. In the Incompleteness Argument, it was shown that the Neo-conventionalist cannot provide us with an account of the source of the necessity for all necessary truths within her own system – namely, the Neo-conventionalist cannot provide us with an accurate account of the source of the necessity of the restriction(s) on the complementary subset

[44] A similar line of reasoning works equally well against the *conventionalist* version of Humeanism, which will be explained in Chapter 3.

pairs of W that are crucial for Neo-conventionalism. In the Stroud Argument, it was shown that even if there are multiple complementary subset pairs of W, we cannot latch onto any complementary subset pair of W where one of the mathematical, logical, or even metaphysical truths (that we all accept as necessarily true) is either contingently true or necessarily false. In other worlds, we don't determine which worlds are *the* possible worlds and which worlds are *the* impossible worlds. We don't decide which truths are necessary. I will develop one last objection to Neo-conventionalist's account of the source of necessity in Chapter 4 – it's incompatibility with Global Modal Error.

Chapter 3: A Critique of the Humean Account of the Source of Necessity

3.0 Introduction

In this chapter I will critique Ted Sider's dependent account of the source of the necessity that appears in his book, *Writing the Book of the World*. Sider calls his account 'Humeanism' "… for the lack of a better word" (Sider, 2011, p. 269). The Humean contends that necessary sentences or propositions have only two features – (i) they are true, and (ii) they are of a certain sort – and denies that there are any "further facts" that ground the necessity of necessary truths (Sider, 2011, p. 269).[45] In what follows, we will examine in great detail Sider's two differing accounts of how we could be the source of the necessity that make "certain sorts" of sentences or propositions necessarily true.

Before we get to that, though, it is worth mentioning that Sider partially sketched a theory of the source of necessity based on the same two features of necessary sentences or propositions (truth and being of a certain sort) in his earlier article, "Reductive Theories of Modality," which, as mentioned in a footnote in Chapter 2, inspired Cameron's Neo-conventionalist account. The theory he sketched in that article can be thought of as a precursor to his more developed Humean theory. I will be focusing exclusively on Sider's more recent Humean account of the source of necessity in this

[45] The denial of any further facts, with the idea that these "further facts" are a feature of the fundamental structure of reality, is why Sider calls this account "Humeanism". David Hume, in *An Enquiry Concerning Human Understanding*, argued that there is nothing more to our notions of necessity and causation other than (i) the observation of constant conjuncts of events, and (ii) after experiencing a constant conjunction between two events (e.g. e_1 followed by e_2), the mind's custom to expect e_2 after experiencing e_1. According to Hume, "our idea, therefore, of necessity and causation arises entirely from the uniformity, observable in the operations of nature; where similar objects are constantly conjoined together, and the mind is determined by custom to infer the one from the appearance of the other. …Beyond the constant *conjunction* of similar objects, and the consequent *inference* from one to the other, we have no notion of any necessity, or connexion" (Hume, 1993, pp. 54-5).

chapter. I'm doing this for a few reasons. First, Sider's partially sketched account in "Reductive Theories of Modality" is solely focused on necessity by convention. According to Sider:

> It might still be a convention to call logical, analytic, and mathematical truths necessary. It would be analytic to 'necessary' that logical, analytic, and mathematical truths are necessary. 'Necessary' would be a word for used for truths of certain kinds. (Sider, 2005, p. 206)

For Sider, conventions have nothing to do with the *truth* of logical, mathematical, or analytic sentences or propositions (Sider is not a Conventionalist), but conventions are the basis of their modal profiles. To call a sentence or proposition 'necessary' is merely to assert that that sentence or proposition is either a logical, analytic, or mathematical sentence or proposition, and it was determined by convention that logical, analytic, and mathematical sentences or propositions are the one that we label "necessary". Sider's more developed Humean account has a similar conventionalist component; however, Sider adds a subjectivist component (or what he sometimes calls a "projectivist" component) to the Humean account that can be used as an account of the source of necessity. I will tease apart the differences between the two components of Humeanism and how Sider uses them shortly. Second, Sider acknowledges that the theory that he sketched in "Reductive Theories of Modality" is far too simple to be plausible. He points out that that sketch of a theory says nothing about necessary truths that are not of the logical, analytical, or mathematical kind (e.g. metaphysically necessary truths). Sider believes that there are such necessary truths and that any complete account of necessity must explain the source of those truths' necessity (Sider, 2005, p. 207-8). The Humean account does just this – Sider uses Humeanism as the source of the necessity that makes necessary truths that are not of the logical, analytic, or mathematical kind necessarily

true. Lastly, I am focusing on Humeanism for the obvious reason that it is Sider's most recent, most developed account of the source of necessity and, presumably, the one that he thinks is correct.

I will begin by providing a rough sketch of Sider's overall project in *Writing the Book of the World*, which will provide us with a basis for understanding Humeanism. Next, I'll explain Sider's argument for his claim that the fundamental structure of the world is not modal – modality is not part of the fundamental language of the world. That will lead us to a discussion of Sider's accounts of convention and subjectivity. First, I will provide a detailed account of Sider's notion of convention and how it could be the source of the necessity that makes necessary truths necessarily true – i.e. the conventionalist version of Humeanism – followed by a critique of that account. I will then explain Sider's account of subjectivity and how it could be used as an account of the source of the necessity that makes necessary truths necessarily true – i.e. the subjectivist version of Humeanism. I will develop that version of Humeanism in greater detail using Stroud's insights into the work of Wittgenstein, which was discussed in the last chapter, raise an objection to that account, and develop another version of the subjectivist version of Humeanism. I will then argue that that subjectivist version of Humeanism is the most promising dependent account of the source of the necessity that makes necessary truths necessarily true.

3.1 Sider's Project in *Writing the Book of the World* and the Non-fundamental Nature of Modality

Sider's main argument in *Writing the Book of the World* is an argument for realism about structure. Metaphysics is the study of the fundamental nature of the world and Sider

contends that that fundamental nature is structured. What does Sider mean by 'structure'? Before considering Sider's answer to that question, let's first briefly consider Sider's very general account of structure and its linguistic (semantic) and epistemic roles. Sider explains:

> Discerning "structure" means discerning patterns. It means figuring out the right categories for describing the world. It means "carving nature at its joints", to paraphrase Plato. It means inquiring into how the world fundamentally is, as opposed to how we ordinarily speak or think of it. (Sider, 2011, p. 1).

For Sider, certain concepts describe the fundamental structure of the world (i.e. cut nature at the joints). The concepts that describe the fundamental structure of the world, according to Sider, are the concepts of logic, mathematics, physics, and the concept 'structure' itself. Sider calls languages that only contain these concepts that describe the fundamental structure of the world "fundamental languages" (Sider, 2011, pp. 6-8).

Now, Sider's account is not a language first account (such as Michael Dummett's account in *The Logical Basis of Metaphysics: The William James Lectures*) where our language determines the structure of the world. The opposite is the case.[46] Sider contends, "realism about structure leads to realism about fundamental languages" (Sider, 2011, p. 8). The fundamental structure of our world determines the semantics of our fundamental languages. First, if the fundamental structure of the world is carved up in an objective way, then all fundamental languages will have predicates that track those joints in nature. For example, if certain objects, say electrons, are part of the fundamental structure of the world, then a fundamental physics language will have a predicate for

[46] According to Sider, "if structure is just a reflection of our language (or whatever) then so are the facts about similarity, intrinsicality, laws of nature, the intrinsic structure of space and time … And this incredible. …A certain 'knee-jerk realism' is an unargued presupposition of this book" (Sider, 2011, p. 18).

categorizing those objects (e.g. in our fundamental physics language we have the predicate 'electrons' that tracks that joint in nature). Second, a fundamental sentence or proposition is true in virtue of the structure of the world. According to Sider, "a fundamental truth, for me, is a structural truth; and a structural truth is just a true sentence composed only of joint carving expressions; so any true sentence composed only of expressions drawn from some structural truth must itself be a structural truth" (Sider, 2011, p. 148). The fundamental structure of the world determines whether sentences or propositions composed of only fundamental expressions are true or false. Lastly, Sider contends that classical logic is the logic of any fundamental language. Sider explains, "… in fundamental languages: i) the logical ideology includes that of classical first-order logic; and ii) the consequence relation (over the first-order fragment anyway) is classical" (Sider, 2011, p. 231). Sider does not think that conjunctions, negations, etc. exist as objects in reality, but they do capture an objective truth about reality (Sider, 2011, p. 92-3). For example, if e_1 and e_2 are both electrons, then the fundamental language will have a conjunction connective to express that fact, which makes the proposition that e_1 and e_2 are both electrons true.[47] The epistemological project is the "…figuring out the right categories for describing the world" (Sider, 2011, p. 1).

[47] Sider also considers whether the category of sentence carves nature at the joint. Sider explains, "asking whether the category of sentence carves at the joints is less familiar than asking whether a give predicate carves at the joints, but the underlying idea is the same. When we ask whether quantifiers, modal operators, or causal predicates carve at the joints, we are asking whether certain facets of our conceptual scheme latch onto reality's distinguished structure. Whether our discourse using the facet is objective, semantically determinate, worthy of attention, and so on turns on this matter of joint-carving" (Sider, 2011, p. 254). Sider argues that the category of sentence carves nature at the joint. The reason for this has to do with nonfundamental languages (e.g. English) that "… have an appropriate sort of metaphysical semantics" (Sider, 2011, p. 255). In those languages there will be sentences that are composed out of only fundamental concepts (Sider calls these sentences "saturated") and sentences that are composed out of fundamental concepts and non-fundamental concepts (he calls these sentences "unsaturated"). Since those languages have both saturated and unsaturated sentences, those languages do not carve nature at the joints. The fact that those languages don't carve nature at the joints whereas fundamental languages, which only

So what does Sider mean by 'structure'? Sider takes the concept 'structure' as primitive – there is no definition of 'structure'. He defends this move by first claiming that understanding a philosophical concept rarely depends on having a definition for that concept. Sider then explains that our understanding of a philosophical concept is hardly ever based on our direct experiences of the world (most notably, modality is not based on our direct experiences of the world). Rather, most of the time we understand philosophical concepts via the roles that they have in our theorizing (Sider, 2009, p. 9). We posit structure and, according to Sider, we are justified in doing so to the extent that structure "… improves our understanding of the world …" (Sider, 2011, p.10). The key aspect of positing the existence of structure is its ability to provide us with a unified theory of an underlying feature of reality that will aide in our development of theories in a number areas in philosophy. Sider's approach is reminiscent of one of David Lewis' arguments for Modal Realism that he advances in *On the Plurality of Worlds*. Recall that Modal Realists claim that the possible worlds are worlds that concretely exist in logical space (i.e. possible worlds are not abstract objects). On the face of it, such a thesis seems outlandish. One way Lewis confronts this initial impression is to explain how useful concretely existing possible worlds in logical space are for our philosophical theorizing. Lewis contends:

> As the realm of sets is for mathematicians [whose accepted existence allows for economic and united mathematical theories], so logical space is a paradise for philosophers. We have only to believe in the vast realm of *possibilia*, and there we find what we need to advance our endeavors. We find the wherewithal to reduce the diversity

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have saturated sentences, do carve nature at the joints indicates that nature is carved at the joints when it comes to sentences. Sider then says, "the reader may have a sense that we have gone off the rails. To be honest, I share that sense. The claim that the category of sentence carves at the joints, for example … strains to the breaking-point my intuitive grip on the notion of joint-carving. But on the other hand, it's evident from examples that there just is a metaphysically significant notion of saturation" (Sider, 2011, p. 257).

> of notions we must accept as primitive, and thereby to improve the unity and economy of the theory that is our professional concern – total theory, the whole of what we take to be true. …The benefits are worth their ontological cost. Modal realism is fruitful; that gives us good reason to believe that it is true. (Lewis, 1986, p. 4)

For the Modal Realists, the usefulness of possible worlds in logical space in our theorizing (or Lewis' "total theory") is warrant enough for accepting their existence. Likewise, for Sider, the usefulness of structure in parts of our theorizing (e.g. our theorizing on objectivity, the substantivity of debates, metametaphysics, etc.) is warrant enough for accepting its existence. With that said, Sider does claim that the concepts of logic, mathematics, physics, and 'structure' itself cut nature at the joints. If those concepts cut nature at the joints, then we know a lot about the fundamental structure of reality.

Now, Sider does provide us with two ways in which to deny that structure can be reduced to other phenomena. First, there is an extensional argument for the irreducibility of structure – there is no reduction of structure to other phenomenon (e.g. laws of nature) that will provide us with an adequate extension for 'structure'. According to Sider, if we reduce structure to laws of nature, then 'structure' will not do the work that we need it to do insofar as reducing structure to laws of nature will not provide us with a straightforward foundation for our mathematical, logical, and structure notions, which Sider claims carve nature at the joints. The laws of nature will be unable to provide a straightforward foundation for these notions to the extent that it is unclear to what extent those notions are a part of the laws of nature. If that is the case, then the extensions of our mathematical, logical, and structural notions is unclear (Sider, 2011, p. 15). Sider explains, "a notion of structure that is too closely tied to lawhood will not be general enough to do all the world it needs to do" (Sider 2011, p. 15). Second, Sider presents a

systematic objection to the reduction of structure to other phenomena. Positing fundamental structure, Sider contends, is better than positing fundamental natural laws. The thought here is that adding a notion of fundamental (primitive) natural laws does not increase the explanatory power of a physical theory. In other words, positing fundamental laws won't increase the usefulness of our scientific theories – they'll be just as useful without positing fundamental laws. A fundamental notion of structure, on the other hand, does increase the explanatory power of certain philosophical theories (e.g. ontology, metametaphysics, etc.) (Sider, 2011, p. 15). One of Sider's main aims in *Writing the Book of the World* is to argue that structure is useful in this way. As explained above, the key aspect of positing the existence of structure, according to Sider, is its ability to provide us with a unified theory of an underlying feature of reality that will aid in our development of theories in a number areas in philosophy.

Before we move on to Sider's objection to modality being fundamental, it is important to note that Sider does not argue that the concepts of logic, mathematics, physics, and structure are the only concepts that describe the fundamental structure of the world. It is also important to note that Sider does not provide us with any fully developed, individual arguments for those concepts cutting nature at the joints (e.g. he does not provide us with an argument for mathematical realism). Rather, Sider contends that debates in metaphysics should be reframed as debates about the fundamental structure of reality. By doing that, he contends, they become substantive debates. Sider goes into some detail about the many ways in which a debate can be substantive, but for our purposes (discovering the source of the necessity that makes necessary truths necessarily true), only one way in which a debate can be substantive is pertinent. A

debate is substantive, according to Sider, if it is a debate over which of our fundamental terms (i.e. logical, mathematical, or physical terms) uniquely cuts nature at the joints (Sider, 2011, pp. 46-7). For example, the debate between the mathematical realists and the mathematical antirealists on the question of the 'real' existence of numbers is a substantive debate about whether our mathematical number words cut nature at the joint. On the one hand, if the mathematical realists are correct and numbers do exist, then our mathematic number words cut nature at the joints – numbers are part of the fundamental structure of reality. On the other hand, if the mathematical antirealists are correct, then our mathematical number words do not cut nature at the joint – numbers are not part of the fundamental structure of reality. What the mathematical realists and the mathematical antirealists are debating about, then, is the fundamental structure of the world.

Is the fundamental structure of the world modal? Do our modal terms (e.g. 'necessary', 'possible', 'contingent', 'could', etc.) cut nature at the joints? Sider contends that the fundamental structure of the world is non-modal. His argument for this position is an ideological economy argument (an argument that is, for all intents and purposes, the opposite of his systematic argument for the irreducibility of structure), which is Quinean in nature, and is rather straightforward. Sider begins by noting that if it were the case that our modal terms cut nature at the joints, then the fundamental structure of the world would be modal. Now, Sider takes structure to be primitive, as explained above. If structure is primitive and structure is modal, then our modal notions that describe that structure are primitive. Against this, Sider argues:

> Modal talk is certainly common in ordinary and special-science discourse. But we do not generally take notions from these high-level domains as good candidates for being

> metaphysically basic, as "proper annex[es] to austere scientific language" (Quine, [1976b], p. 863), since they are unneeded for the most fundamental inquires of mathematics and physics. We tend to think of psychological, economic, political, and other special-science notions as being nonfundamental. Many of us think the same about various philosophical notions: semantic, moral, epistemic, causal. Since modality is unneeded for the most fundamental inquiries, it too is metaphysically nonfundamental, however conceptually fundamental it may be. (Sider, 2011, p. 267)

It is important to note that Sider is relying on the unargued claim that our notions in the "special-sciences" (e.g. psychology) and certain areas of philosophy (let's call these areas "special-philosophies") are modal and nonfundamental, and the implied premise that modal notions are only used in nonfundamental discourse (i.e. they are not used in fundamental mathematical discourse or fundamental physics discourse). If the notions in our special-sciences and special-philosophies are nonfundamental, then the notions used in the special-sciences and special-philosophies will not be useful for describing the fundamental structure of the world. If the only use of modal notions is in the special-sciences and the special-philosophies discourses and the notions in the special-sciences and the special-philosophies are not useful for describing the fundamental structure of the world, then modal notions will not be useful for describing the fundamental structure of the world. If modal notions are not useful for describing the fundamental structure of the world, then they don't cut nature at the joints. The reason why they don't cut nature at the joints is that the fundamental structure of the world is non-modal.[48]

[48] One objection to Sider's ideological economy argument is that modal notions are used in our fundamental mathematical discourse. Geoffrey Hellman, in *Mathematics Without Numbers: Towards a Modal-Structural Interpretation*, has developed a nominalist, structuralist theory for the foundations of mathematics that relies on a primitive notion of logical possibility. If Hellman's theory is correct and Sider's claim that the fundamental structure of the world is non-modal is also correct, then mathematical discourse is not fundamental discourse (Sider acknowledges that this would be the case (Sider, 2011, p. 273), but he does not consider Hellman's theory). Since our physics discourse is heavily reliant on mathematics, then, arguably, most of our physics discourse would also be nonfundamental (Sider does not consider this possibility). Now, if it turned out that our all of our mathematical discourse and most of our physical discourse were not fundamental discourses since they're modal, then it is hard to see what work Sider's realist take on structure is helping us with. So using Sider's own systematic objection, it appears

If Sider is correct and the structure of reality is non-modal, then the structure of reality is not the source of the necessity that makes necessary truths necessarily true. What, then, is the source of the necessity that makes necessary truths necessarily true? Sider provides us with two possible Humean answers to that question (SNQ). One of the answers, arguably his preferred answer, is based on a conventionalist version of Humeanism (let's call this version "Conventionalist Humeanism") and the other answer is based on a subjectivist (projectivist) version of Humeanism (let's call this version "Projectivist Humeanism").[49] In the next two sections I will present Sider's notion of conventions and the Conventionalist Humean's answer to SNQ, and raise an objection to that answer to SNQ (§3.2). In the following section (§3.3), I will present Sider's notion of subjectivism – projectivism – and the Projectivist Humean's answer to SNQ and raise some concerns with that answer to SNQ.

3.2 A Critique of the Conventionalist Humean's Answer to SNQ

In this section I will critique the Conventionalist's Humean's account of the source of the necessity that makes necessary truths necessarily true. I will begin by presenting Sider's account of conventions and the Conventionalist Humean's account of the source of necessity. I will then develop two objections to the Conventionalist Humean's account.

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that if Hellman's foundational account of mathematics is correct and Sider is correct about the non-modal structure of reality, then positing structure would not increase the explanatory powers of our mathematical and, arguably, physical theories. Now, this does not mean that Sider's theory of structure would not be useful, but it would limit its applicability. Nevertheless, what this objection draws out is that Sider's ideological economy argument, as stated, is reliant on the controversial claim that mathematical discourse (and, arguably, by extension, physical discourse) is non-modal, which is something that he does not argue for.

[49] Sider gives a fairly detailed account of what I'm calling "Conventionalist Humeanism", but he does not provide us with an account of Projectivist Humeanism. Nevertheless, Sider claims, "perhaps the choice [between candidate meanings for 'necessary'] reflects something important about the role 'necessary' plays in our conceptual lives, in which case the facts are 'subjective' (or 'projective'). More likely, the truth is somewhere in between [conventional and subjective]" (Sider, 2011, p. 269).

The first objection will be a modified version of the Incompleteness Argument that I raised in Chapter 2 against the Neo-conventionalist's account of the source of necessity, which will show the Conventionalist Humean's account is also an incomplete account of the source of necessity. The second objection that I will raise will be the Stroud Argument (also presented in Chapter 2, but there won't be any need to modify this objection for it to work against the Conventionalist Humean account), which will show that the source of necessity cannot be conventions insofar as there are no viable, alternative truths that we can choose to be necessary.

3.2.1 Conventions and Conventionalist Humeanism

Sider begins his discussion of conventions by explaining that there are many types of conventions. We have conventions that govern certain actions that we perform on a routine basis. For example, in the United States we have adopted a convention that a driver stops her car at an intersection when the traffic light is red and drives through the intersection when the traffic light is green (the convention for yellow traffic lights is not so clearly defined – some consider it a sign to speed up to make the light and others see it as a sign to slow down; but either way, we all know a yellow traffic light is a clear indicator that a red traffic light will soon appear). We also have conventions for assigning meaning/content to particular words. For example, it is a convention that we chose the word 'rain' in English to have the meaning that it has (something like 'moisture in the air that falls in the form of droplets'). We could have chosen to create some other word, say 'quain', and given it that meaning. The type of convention that Sider is concerned with, and the one that is important for our purposes, differs from those two types of conventions (Sider, 2011, p. 54). Sider explains, "sometimes we have a certain

semantic goal; we need to introduce a word in order to accomplish that goal; and there are a number of candidate meanings, each such that the goal would be accomplished equally well if that candidate were chosen as the meaning of the word" (Sider, 2011, p. 54). Sider calls these kinds of conventions "candidate-selection conventions". Take for example our use of 'ton' in the United States for weight measurements. We use 'ton' to efficiently talk about the weight of really, really heavy things. In the United States, a ton is 2000 pounds. However, we could have chosen a slightly smaller weight (say 1550 pounds) or a slightly larger weight (say 2050 pounds) for the content of 'ton'. Both of those alternatives would have accomplished the same semantic goal of efficiently talking about the weight of objects that are really, really heavy if they were chosen. Now, there are two criteria, according to Sider, that the alternative candidate meanings must meet in order to server our purposes equally well – (i) they must carve nature at the joints equally well, and (ii) the candidate meaning must help us achieve our semantic goal (Sider, 2011, pp. 54-5). In our example of 'ton', the weight that we actually adopted (2000 pounds) and the alternative weights that we could have adopted (1550 pounds and 2050 pounds) all carve nature at the joints equally well (i.e. there is no single, correct unit of weight for 'ton' that uniquely cuts nature at the joints). Furthermore, any of those weights (1550 pounds, 2000 pounds, 2050 pounds) would allow us to accomplish our sematic goal of being able to talk about the weight of really, really heavy things more efficiently.

According to Sider, there are a few important criteria that must be met in order for a semantic choice to be an instance of a candidate-selection convention (from here on out I will use 'convention' for 'candidate-selection convention' unless otherwise noted). First, there must be a candidate that we selected and, importantly, it must be the case that

that selection was arbitrary. In our example of 'ton', we arbitrarily chose 2000 pounds as the content of 'ton' as opposed to 1550 pounds or 2050 pounds. The reason that that choice was arbitrary was that (i) we actually had a choice between equally good candidates, and (ii) we decided, perhaps somewhat randomly, to adopt one of those candidates over the others. Now, if there is no selection of one of the candidates (due to either semantic indeterminacy or vagueness) or the selection is not arbitrary (there is something about us that makes it so we adopt a particular candidate over the other candidates that are equally joint carving alternatives – more on this in Section 3.3), then there is no conventionality. Second, Sider explains,

> Also, 'conventional' seems most apt when the arbitrary choice is made more or less consciously, when alternative choices stare us in the face, and when those choices accomplish *exactly* the same semantic goal; it seems less apt when the choice has been made implicitly and collectively, over time, when no one thinks much about the alternatives, and when the alternatives accomplish slightly different semantic goals" (Sider, 2011, p. 56, Sider's italics).

In the case of selecting 2000 pounds as the content of 'ton', here in the United States we consciously decided to choose that candidate over the other candidates, we clearly knew of other possible candidates (especially in this case, since the British had chosen 2240 pounds as the content of the British word 'ton'), and the alternative candidates achieve exactly the same sematic goal (to more efficiently talk about the weight of really, really heavy things).

We are now in a position to consider the Conventionalist Humean's answer to the source of necessity question (i.e. SNQ). First, as explained above, Sider claims that the structure of reality is non-modal, so our term 'necessary' is not part of the fundamental language that describes the fundamental structure of the world – 'necessary' does not cut nature at the joints. The first task for the Conventionalist Humean, then, is to determine

the content of 'necessary'. According to Sider, "to say that a proposition is necessary, according to the Humean view, is to say that the proposition is i) true; and ii) of a certain sort" (Sider, 2011, p. 269). It is important to note that the Conventionalist Humean is not claim that those truths are *true* by convention (Sider, like Cameron, appeals to Quine's arguments against Conventionalism in "Truth by Convention" and points out that conventions for truth are contingent, so the modal systems S4 and S5 would be false); rather, the Conventionalist Humean is claiming that those truths are *necessary* by convention (Sider, 2011, p. 268). Now, what is crucial in this definition is that for a proposition to be necessary, it needs to be of a certain sort. Sider's view on what certain sorts of propositions are necessary in *Writing the Book of the World* is similar to the roughly sketched view that he presented in "Reductive Theories of Modality." The certain sorts of propositions that are necessary are the propositions that express logical or mathematical truths.[50] So when we say, "the proposition that 2 + 2 = 4 is necessary,"

[50] It seems rather odd that the semantic content of 'necessary', when attached to propositions, is that the proposition is *true* and of a certain sort. This is especially the case if sentences like "the proposition that 2 + 2 = 4 is necessary" are elliptical sentences, which would be the case for Sider since he claims fundamental reality is non-modal, so there are no possible worlds at the fundamental level in which that proposition (or other necessary propositions) would *exist* at all of the possible worlds. So if those kinds of sentences are elliptical, then when we say, "the proposition that 2 + 2 = 4 is necessary", what we are really saying is "the proposition that 2 + 2 = 4 is necessarily true". Now, it seems plausible that there are propositions of a certain sort, which is the sort that we call 'necessary' by convention, that are false. For example, the proposition that 2 + 2 = 5 is a proposition of a certain sort – a mathematical proposition, the sort of propositions that are necessary by convention – and it is false. If we only attach 'necessary' to true propositions of a certain sort, then how should we evaluate propositions that are necessary, but false? We cannot use the negation of 'necessary' – 'not necessary' – since that would mean it is contingent. One clear way to evaluate those kinds of propositions is to just use a word that we already have for things that are necessary and false – 'impossible'. Our convention for the meaning of 'impossible' could be that they are propositions that are false and of a certain sort. But 'impossible' of course just means 'not possible', and this is the problem with this solution – on this solution necessity and possibility are no longer interdefinable. Typically, 'P is necessarily true' is definable as 'it is not possible that P is not true'. But we could rephrase this as: 'P is necessarily true' is definable as 'it is impossible that P is not true'. So on the solution that we are considering, the sentences "the proposition that 2 + 2 = 4 is necessarily true" and "it is impossible that the proposition that 2 + 2 = 4 is not true" (which could be rephrased as "it is impossible that the proposition that 2 + 2 = 4 is false", since Sider accepts classical logic) have different semantic content. But those sentences seem to be saying the same thing (at the very least, they have the same truth conditions,

what we are saying is that that proposition is true and that proposition is of a certain sort – a proposition that express a mathematical truth. Now, the Conventionalist Humean will claim that it is by convention that we determined 'necessary' applies to these sorts of propositions. Sider explains, "there are many candidate meanings for 'necessary', corresponding to different 'certain sorts' our linguistic community might choose. Since none of these candidates carves at the joints, our linguistic community is free to choose whichever of these it likes" (Sider, 2011, p. 269). As explained above, in order for there to be a convention there must be other candidates that are equally good at carving nature at the joints (which is no problem in the case of candidate meanings for 'necessity', since the fundamental structure of reality is non-modal; ergo, none of the candidates carve nature at the joints, so all of the candidates are equally good a carving nature at the joints) and our choice must be arbitrary (nothing about us is forcing us to choose the mathematical and logical truths over the other viable candidates). According to Sider, "the core idea of the Humean account, then, is that necessary truths are truths of certain more or less arbitrarily selected kinds" (Sider, 2011, p. 271). So what is the source of the necessity that makes necessary truths necessarily true according to the Conventionalist Humean? We are the source of the necessity that makes necessary truths necessarily true insofar as we are the ones who decide by convention which sorts of propositions are labeled 'necessary' and which sorts of propositions are not (which are the alternative candidates).

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which is arguably the sematic content of sentences like these (by no means the sematic content of all sentences, but sentences that are talking about the truth-values of propositions)), so they should have the same sematic content. It could be argued that the difference between the two sentences, if there really is one, is pragmatic in nature, not sematic, but arguing this point would take us too far afield.

Interestingly, Sider does not explicitly explain what our sematic goal is with 'necessary'. Sider does explain:

> *Why* are logical (or mathematical, or analytic, or …) truths necessary? The Humean's answer is that this is just how our concept of necessity works. One can give no deeper answer to this question than to the question of why a water glass counts as a cup (assuming that it does). There are many possible meanings we could have chosen for 'cup'; some include glasses, some don't; none carve nature at the joints better than any others; the meaning we have in fact chosen includes glasses; and that's all there is to it. Likewise for 'necessary'. (Sider, 2011, p. 288)

He goes on to explain that this is the most "flat-footed" answer and that it is quite likely possible to discover some family resemblances between the various kinds of necessary truths.[51] Nevertheless, there is a clear sematic goal associated with 'necessary'. We use modal terms in everyday life and in our theorizing. We use modal terms to talk about the mind (e.g. supervenience), to talk about properties (e.g. essential properties and accidental properties), laws of nature, etc. Since the fundamental structure of the world is non-modal, how are we to evaluate the modal claims that make? Sider's solution, which is clearly evident in his discussion of other kinds of modalities (e.g. de re modality), is to take the truths that we have labeled 'necessary' by convention and build a model of possible worlds in which the truths that we have labeled 'necessary' are true at every possible world (note that necessity comes first, then possible worlds are defined on those necessities). We can then introduce new modal axioms that account for the modality of the propositions in our theories. I presume, then, that our semantic goal with 'necessary'

[51] Sider explain that the Humean might be able to give a partial answer to the question of why these certain truths are necessary. Many of the most notable necessary truths are thought to be *a priori*. It is also inconceivable to think of many of the most notable necessary truths as false. However, Sider explains, "So some unification of the class of modal axioms [i.e. necessary truths] is possible. But a Humean will live with some disunification. She will be willing to admit that there is no one feature that all the modal axioms have in common. The spirit of Humeanism, after all, is that the line between the necessary and contingent is not discovered, but rather drawn by us – perhaps somewhat arbitrarily" (Sider, 2011, p. 289). I take this to mean that there is no single, clear semantic goal for labeling propositions as 'necessary'.

(at least in a theoretical sense) is to demarcate certain truths that must be true at every possible world when we introduce possible worlds.

As mentioned above, Cameron's Neo-conventionalist account of the source of necessity is inspired by Sider's roughly sketched theory in "Reductive Theories of Modality." There are, however, striking differences between Neo-conventionalism and Conventionalist Humeanism, which is based on the theory that Sider sketched in "Reductive Theories of Modality." Before delving into my objections to Conventionalist Humeanism, then, it is worthwhile to once again highlight the two major differences between Cameron's Neo-conventionalism and Sider's Conventionalist Humeanism (for the sake of making the distinction between the two crystal clear). First, the Neo-conventionalist and the Conventionalist Humean have different ontological commitments. Recall that the Neo-conventionalist's account of the source of necessity has to do with what Cameron calls an "unnatural" (i.e. not tracking some 'joint in nature'), yet mind-independent distinction between the possible worlds and the impossible worlds. For the Neo-conventionalist, possible worlds and impossible worlds are abstract objects that exist independently of our conception of them, which makes the distinction between them mind-independent. So the Neo-conventionalist accepts the existence of abstract objects in her ontology. Sider, on the other hand, does not posit the existence of these abstract objects in the Humean ontology (at least at the fundamental level of reality – more on this shortly). This is evident in Sider's discussion of how to use the Humean account to talk about certain other kinds of modality (e.g. *de re* modality). According to Sider, "the general approach is to take the Humean account as an account of some initial notion of necessity; use that initial notion to introduce abstract

possible worlds and individuals; and then use those abstract possible worlds and individuals to define a further, enriched, sort of necessity" (Sider, 2011, p. 288). If we are introducing abstract possible worlds and individuals, then clearly those abstract possible worlds and individuals do not exist in the fundamental ontology of the world. The second major difference between Neo-conventionalism and Conventionalist Humeanism follows directly from the first. The Neo-conventionalist and the Conventionalist Humean have different conceptions of what makes certain necessary truths necessarily true. On the one hand, according to the Neo-conventionalist, necessary logical, mathematical, and analytic truths are necessarily true because they are true at every possible world. For the Conventionalist Humean, on the other hand, the necessary logical, mathematical, and analytic truths aren't necessarily true because they are true at every world; rather, we decided to label those kinds of truths as 'necessary' (meaning that they are true and of a certain sort) and then we introduce abstract possible worlds in which all those truths are true at every possible world.

3.2.2 The Incompleteness Argument

One of the objections that I raised in Chapter 2 against the Neo-conventionalist's account of the source of necessity, the Incompleteness Argument, showed that the Neo-conventionalist's account is, at best, an incomplete account of the source of necessity insofar as there are certain propositions that must be necessarily true for Neo-conventionalism to be correct and the source of their necessities are not conventions. In what follows, I will argue that there are certain propositions that must be necessarily true if the Conventionalist Humean's account of the source of necessity is correct and that the

source of their necessity cannot be rooted in our conventions for deciding which sorts of truths to apply 'necessary' to.

To begin, let's briefly review part of Sider's account of conventions. According to Sider, "… for conventionality, there must be a selected candidate (or a vague selected range, in the case of vague conventionality), and that selection must be made by arbitrary choice" (Sider, 2011, p. 56). Notice that Sider is pointing out two necessary conditions for conventions in this passage. First, if there is a convention, then it is necessarily the case that we selected one of the candidate meanings. Second, if there is a convention, then it is necessarily the case that our choice of candidate meaning was arbitrary (recall that one of the criteria for the choice to be arbitrary was that the any one of the candidates meanings will do just as good of job of helping us reach our semantic goals as any other candidate meaning). Let's now consider the source of the necessities of the following propositions:

PROP-Select: If there was a convention, then we selected a candidate.

PROP-Arbitrary: If there was a convention, then we arbitrarily chose one of the candidates.

Both PROP-Select and PROP-Arbitrary are crucial components of the Conventionalist Humean's account of the source of necessity. If PROP-select were false, then there would be conventions where we didn't select a candidate. If we didn't select a candidate, then we won't be able to accomplish our semantic goals (which is the whole point of having a convention in the first place). So, it must be the case that we selected one of the candidates. If PROP-Arbitrary were false, then there would be conventions where our choice between candidates was not arbitrary. If our choice between candidates was not

arbitrary, then something (possibly something about us) forced us to choose the candidate that was chosen. But if we were forced to choose one of the candidates, we really didn't have a choice, which means that there was no convention. So, it must be the case that we arbitrarily chose one of the candidates. Hence, it must be the case that PROP-Select and PROP-Arbitrary are necessarily true if Conventionalist Humeanism is the correct account of the source of necessity.

What is the source of the necessity of PROP-Select and PROP-Arbitrary? Since both PROP-Select and PROP-Arbitrary must be necessarily true if Conventionalist Humeanism is the correct account of the source of necessity, then we did not arbitrarily choose to label PROP-Select and PROP-Arbitrary as 'necessary'. If there was no arbitrary choice to label PROP-Select and PROP-Arbitrary as 'necessary', then there was no convention, according to Sider's own account of conventions. If there was no convention, then PROP-Select and PROP-Arbitrary were not labeled 'necessary' by convention. Yet, both PROP-Select and PROP-Arbitrary are necessary (whether we label them as 'necessary' or not) if Conventionalist Humeanism is correct. The Conventionalist Humean, then, cannot provide us with an account of PROP-Select's and PROP-Arbitrary's necessity using Conventionalist Humeanism. Hence, Conventionalist Humeanism is, at best, an incomplete account of the source of necessity.

Could the Conventionalist Humean claim that Projectivist Humeanism is the alternative candidate, so there was an arbitrary choice whether or not to label PROP-Select and PROP-Arbitrary as 'necessary'? This will not help. Let's suppose that we arbitrarily chose Projectivist Humeanism instead of Conventionalist Humeanism. If we were to select Projectivist Humeanism instead of Humean Conventionalism, then it

would still be the case that PROP-Select and PROP-Arbitrary must be necessarily true. Why? It still must be the case that if there was a convention, then (i) a candidate was selected, and (ii) that selection was arbitrary. This is just what it means to have a convention. Hence, it is still the case that PROP-Select and PROP-Arbitrary express necessities (an awfully intuitive notion of 'necessity' anyway – 'must be true') even if we don't label those propositions as 'necessary' because we have arbitrarily chosen Projectivist Humeanism. Hence, there are certain sorts of propositions, like PROP-Select and PROP-Arbitrary, that must be true no matter what alternative candidate we arbitrarily choose, and they are the kinds of truths that we call "necessary". This brings us to another problem with this account. Do we have any choice (either arbitrary or non-arbitrary) of whether necessity is based in conventions or something else that is not part of the fundamental structure of the world? If the world is a certain way, then the Conventionalist Humean's account of necessity will be correct. If the world is some other way, then some other non-fundamental account of necessity, such as Projectivist Humeanism, will be correct. If we have no choice in the matter of whether necessity is based in conventions or something else, then the necessity (i.e. 'the must be true') of PROP-Select and PROP-Arbitrary, which must be true no matter which account is correct, is not rooted in what we decide to label 'necessary'. Rather, their necessity is rooted in the way the world is.

Another way in which the Conventionalist Humean could attempt to account for the necessity of PROP-Select and PROP-Arbitrary is via the introduction of abstract possible worlds, which was briefly discussed in the comparison between Neo-conventionalism and Conventional Humeanism. For Sider, we introduce abstract

possible worlds after we have chosen the sorts of propositions that are necessary. For the Conventionalist Humean, this means that we first arbitrarily chose a select number of sorts of propositions amongst the viable alternative candidates that we label 'necessary'. By 'viable' I mean alternative candidates that would allow us to achieve the same sematic goals if they were selected. Let's suppose that we start out with the candidates that Sider seems to prefer – the logical and mathematical truths. After selecting those sorts of propositions as necessary, we can then introduce abstract possible worlds using those necessities. So the abstract possible worlds will be worlds where the logical and mathematical truths are true. We can now introduce other notions of necessity (for example, Sider introduces a notion of *de re* modality via the introduction of modal axioms at this stage). For our purposes, let's introduce a notion of necessity for conventions. Two of the modal axioms that we will introduce for our notion of necessity for conventions will be versions of PROP-Select (e.g. 'any world where there was a convention is a world where we selected a candidate') and PROP-Arbitrary (e.g. 'any world where there was a convention is a world where we arbitrarily chose one of the candidates'). In this way, the Conventionalist Humean can provide us with an account of the necessity of PROP-Select and PROP-Arbitrary as they are stated above.

This account has a similar problem to the first problem that was raised with the first account (note, however, that it avoids the problem of us choosing whether necessities are determined by convention or by something else that is not fundamental insofar as the necessity of PROP-Select and PROP-Arbitrary is at a higher level – the level of possible worlds – in this account). No matter which sorts of propositions we choose to label 'necessary', PROP-Select and PROP-Arbitrary must be true.

Furthermore, PROP-Select and PROP-Arbitrary must be true even if we don't create a system of abstract possible worlds. Since those propositions must be true no matter what, they certainly seem to be the kind of propositions that are necessarily true. Hence, the Conventionalist Humean cannot provide us with an account of the source of PROP-Select's and PROP-Arbitrary's necessity using Conventionalist Humeanism.

There is one last aspect of Humeanism (generally) that produces a truth that must be true if Humeanism is correct. Sider contends, "the Humean treatment of the necessity of the laws of metaphysics undermines 'arguments from possibility' for conclusions in fundamental metaphysics" (Sider, 2011, p. 277). Sider explains that this is the case because if those fundamental laws of metaphysics are true (to determine whether they are true, we only need to check how the world is, not how the world might be), then they are the sorts of truths that we will create modal axioms for, which is in essence to label them 'necessary'. For the Conventionalist Humean, then, this means that those truths are the sorts of truths that we would *choose* to label 'necessary' via the modal axioms (Sider, 2011, pp. 277-8). From these considerations, Sider concludes, "assuming the Humean theory, then, neither modal intuition nor a putative presumption in favor of possibility can be regarded as probative in matters of fundamental metaphysics …" (Sider, 2011, p. 278). Hence, if Conventionalist Humeanism is correct, then no modal arguments will have any bearing on our inquires into fundamental metaphysics.

Now, consider the following proposition:

PROP-Humean: Modal arguments tell us nothing about fundamental metaphysics.

If Conventionalist Humeanism is the correct account of fundamental metaphysics, then PROP-Humean must be true. Why? It cannot be the case that if Conventionalist Humeanism is the correct account of fundamental metaphysics, then it is *possible* for modal arguments to tell us something about fundamental metaphysics, which would be the case if PROP-Humean is contingently true. Suppose for *reductio* that modal arguments did tell us something about fundamental metaphysics. If that were the case, then the modal arguments would be about what is possible and what is necessary for the fundamental structure of the world. If they tell us what is possible and what is necessary for the fundamental structure of the world, then those modal truths would have their modal profiles whether we labeled them as 'necessary' or not to the extent that the source of their modality is the fundamental structure of the world. If that were the case, then the Conventionalist Humean account of the source of necessity would be incorrect. Hence, it must be the case that PROP-Humean is necessarily true.

Now, if PROP-Humean must be true and we create modal axioms that make metaphysical truths like PROP-Humean necessarily true, then according to the Conventionalist Humean, we are the source of PROP-Humean's necessity. Yet, we had no choice in the matter and therefore cannot be the source of its necessity. We don't decide whether the Conventionalist Humeanism is the correct account of fundamental metaphysics or not – either it is or it isn't. If it is the correct account of fundamental metaphysics, then it is necessarily the case that modal arguments will tell us nothing about fundamental metaphysics because the fundamental structure of the world is nonmodal – that is a direct result of Conventionalist Humeanism being the correct account of fundamental metaphysics. Hence, if Conventionalist Humeanism is the

correct account of fundamental metaphysics, then PROP-Humean must be true whether we *choose* to label it as 'necessary' or not.

We have now seen three propositions that all must be true (two generally and one in certain circumstances), which intuitively means that they are necessary. The necessity of all three of these propositions is not grounded in conventions. The first two propositions, PROP-Select and PROP-Arbitrary, must be true no matter which account of modality is the correct account. So we don't decide by convention whether those propositions are necessary or not – they must be must be true (i.e. necessary) even if we don't label them 'necessary'. The last proposition, PROP-Humean, must be true if Conventionalist Humeanism is correct. If Conventionalist Humanism happens to be correct, then PROP-Humean must be true and whether we adopt a convention to label it as 'necessary' has no bearing on that fact. Therefore, the Conventionalist Humean cannot provide us with a complete account of the source of necessity for all necessary truths.

3.2.3 The Stroud Objection

In Chapter 2 I presented Barry Stroud's argument in "Wittgenstein and Logical Necessity" and used it as an objection to the Neo-conventionalist's account of the source of necessity. Recall that in that article, Stroud is challenging the claim that the later Wittgenstein's account of logical necessity is a Conventionalist account. The main thrust of Stroud's argument against that claim is his close examination of what must be the case in order for there to be a convention (in this paragraph 'convention' should be understood in a general sense). Stroud contends that to have a convention entails that we made a choice between two or more equally good candidates (i.e. viable alternative candidates)

(Stroud, 2000, p. 7). For example, if necessity is based on conventions, then it must be the case that there are viable alternative candidates to choose from. In other words, if necessity is based on conventions, then it must be the case that we could have chosen to make the truth of a proposition like the proposition that 2 + 2 = 4 contingent, which is the only other candidate we have for the modality of that proposition (if the truth of every proposition is either contingent or necessary, which seems plausible). Now, if we were to choose, by convention, to make the truth of the proposition that 2 + 2 = 4 contingent, then there would be a possible world where that proposition is false. Stroud's key move is to argue that worlds where propositions like the proposition that 2 + 2 = 4 is false are unintelligible worlds (Stroud, 2000, p. 10). If we consider the world where the proposition 2 + 2 = 4 is false as whole, that world is a truly an odd, incomprehensible world. For example, let's suppose that John, and inhabitant of that world, has two brothers and two sisters. If the proposition that 2 + 2 = 4 is false in that world, what are we to make of the proposition that John has four siblings? If John has two male siblings and two female siblings, then clearly he has four siblings. But if that is correct, then we have an instance of 2 + 2 = 4, and the proposition that 2 + 2 = 4, a mathematical proposition that applies in all domains, is true; yet, in this world it is false. Hence, a world where the proposition that 2 + 2 = 4 is false is an unintelligible world. Since the only alternative candidate for the modality of the proposition that 2 + 2 = 4 is unintelligible, it is not a viable alternative candidate. Ergo, there is only one viable candidate for the modality of the proposition that 2 + 2 = 4 – it is necessary. If there is only one viable candidate, then we didn't make a choice amongst viable candidates. And

a similar argument can be made for any other necessary truth. Therefore, necessity (and more broadly, modality) is not based in conventions.

Stroud's notion of 'convention' is compatible with Sider's notion of 'candidate-selection convention'. For candidate-selection conventions, there must be candidates that all cut nature at the joints equally well and all allow us to achieve our semantic goals equally well. For the Conventionalist Humean, the first criterion is met vacuously for 'necessity' (recall that we use 'necessity' a label for truths that are of a certain sort) insofar as the fundamental structure of the world is non-modal; so, all candidates cut nature at the joints equally well. If all candidates cut nature at the joints equally well (in that none of them cuts nature at the joints), then it appears that we have a choice in the matter. As explained above, it appears to me that the sematic goal 'necessary' is to introduce possible worlds so that we can talk about other kinds of modality (e.g. metaphysical modality). It is not clear what else we would use 'necessary' for. Since fundamental reality is non-modal, calling some truths 'necessary' has no bearing on our understanding or theorizing about fundamental reality. Is our sematic goal to mark truths that give us a certain feeling? It doesn't seem as though the truths that we have labeled 'necessary' have a special feeling (none that I experience, anyway). Hence, to label a truth as 'necessary' is to label it as a truth that will be true no matter what, which is the foundation upon which we build the model of possible worlds. So, if we take into consideration the sematic goal of our use of 'necessary', do we have a choice about what truths are labeled 'necessary'?

We do not have a choice over which truths are labeled 'necessary' if our semantic goal is to introduce possible worlds so that we can talk about other kinds of modality

(which seems to be the only use of 'necessary'). Suppose that we did have a choice over which truths were the truths that are labeled 'necessary'. Suppose further that we decided, by convention, not to label the mathematical truths as necessary and instead only labeled the truths of a different, certain sort as 'necessary' (call those truths "truths-X"). In order to talk about *de re* modality in this scenario, we will have to introduce possible worlds, and we'll introduce those possible worlds via the necessary truths-X. Since the mathematical propositions were not labeled 'necessary', some of them won't be true at every possible world.[52] Why? If it is impossible for a mathematical proposition to be false at a possible world even though we didn't label the mathematical propositions as 'necessary', then that mathematical proposition is necessary whether we label it as so or not (since no matter what we label as 'necessary' that mathematical propositions must be true at every possible world in every possible model, which is just to say that it is necessary it some deeper sense). So if (i) we choose to not label the mathematical truths as 'necessary', (ii) we label some other sorts of truths 'necessary' (i.e. label truths-X as 'necessary'), (iii) we use those truths that we labeled 'necessary' to build a model of possible worlds, and (iv) there is no deeper necessity that makes all of the mathematical propositions true at all of the possible worlds in that model, then there must be a possible world in some model where a mathematical proposition *M* is false at that possible world. Let's suppose, then, that at one of the possible worlds in our model the mathematical

[52] Evidence that this is the case can be found in Sider's discussion of contextualism of metaphysical necessity – the idea all modal terms are contextual. According to Sider, "some modal axioms or rules may be harder to suspend than others, as may be some patterns of suspension; but any pattern is in-principle possible. Thus, there is no sharp line between restricted and unrestricted metaphysical necessity" (Sider, 2011, p. 282). Hence, it seems that Sider would admit that it is possible to have metaphysical possible worlds where some or all of the mathematical propositions are false.

proposition that 2 + 2 = 4 is false. As explained above, Stroud rightly contends that any world where a proposition like the proposition that 2 + 2 = 4 is false is a world that is unintelligible to us. It is truly hard to make sense of a world where it is not the case that 2 + 2 = 4. Now, I have argued that our semantic goal for labeling certain truths as 'necessary' is for the purpose of using those truths to create a model of possible worlds so that we can understand other kinds of modality (e.g. *de re* modality). But if we create a model of possible worlds based on necessary truths-X, then we will have a model that contains unintelligible worlds that are possible worlds. If we have unintelligible worlds that are possible worlds in our model, then we will be unable to understand the necessity of the other kinds of modalities (e.g. necessary existents or the lack thereof) insofar as there is a possible world in that model that is unintelligible. If this were the case, then building a model based on the necessary truths-X will not allow us to achieve our semantic goal. If the model based on necessary truths-X does not allow us to achieve our semantic goal, then the truths-X are not alternative candidates. Since truths-X are just arbitrary truths, there are no alternative candidates to the mathematical truths that we could label as necessary. If there are no alternative candidates, then there is nothing to choose from and, therefore, there is no convention. Hence, we don't have a choice when it comes to the mathematical truths – they must be labeled necessary. If we have no choice, then those truths are not necessary by convention.

3.3 A Critique of the Projectivist Humean's Answer to SNQ

Sider is not committed to the Conventionalist Humean account of necessity. Sider explains, "perhaps the choice [between which sorts of truths are labeled 'necessary'] reflects something important about the role 'necessary' plays in our conceptual lives, in

which case the facts are 'subjective' (or 'projective')" (Sider, 2011, p. 269). In this section I will evaluate the other account of necessity that Sider presents in *Writing the Book of the World*. As explained above, this account is not present in Sider's earlier article, "Reductive Theories of Modality." This new account is fully subjective, but subjective in a particular way. Sider calls this form of subjectivism "Projectivism". I will begin by presenting Projectivism and consider the Projectivist Humean's answer to SNQ. I will then raise an objection to the Projectivist Humean's account of the source of the necessity that makes necessary truths necessarily true. Lastly, I will consider a possible response to my objection and reply to that response.

3.3.1 Projectivism and Projectivist Humeanism

The key difference between a convention and a non-convention for Sider is whether or not the choice that was made was arbitrary. As explained above, for the conventions that Sider is concerned with (candidate-selection conventions) it must be the case that there are alternative candidates that (i) cut nature at the joints equally well, and (ii) are all equally good at helping us realize our semantic goals, and, importantly, it must be the case that we arbitrarily chose one of the candidates over the other equally good candidates. Now, Sider contends that it could be the case that when we look at our choice over which truths will be labeled 'necessary', there will be alternative candidates that (i) cut nature at the joints equally well, and (ii) are all equally good at helping us realize our sematic goals, but the choice between the candidates is not arbitrary. There is something about us that makes it so we are drawn to one candidate over the other equally good candidates – the process is subjective.

There are several different accounts of subjectivity that all give different accounts of how a linguistic community uses certain aspects of their language. One of the alternative accounts that Sider considers is Expressivism. The example that Sider considers is aesthetic judgment and the application of the term 'beautiful'. For the Expressivists, saying "the Mona Lisa is beautiful" is not to assert a proposition that is either true or false; rather, that sentence expresses an attitude that the speaker has towards the painting. When we apply the term 'beautiful' to a painting, the speaker is expressing a "positive aesthetic attitude" towards the Mona Lisa (Sider, 2011, p. 57). So, the term 'beautiful' is subjective to the extent that 'beautiful' is used by that linguistic community to express an individual's subjective attitude towards something that, in that individual's opinion, has positive aesthetic value. Hence, the application of 'beautiful' is subjective (Sider, 2011, p. 57). Sider has a different form of subjectivism in mind when he claims that we are drawn to a particular candidate meaning even though there are other good alternative candidate meanings. Sider provides us with the following definition of this kind of subjectivism:

> **Projectivism** By uttering 'x is beautiful', a speaker, S, communicates the proposition that x is P, where the property of *being P* is a certain physical property that is the linguistic meaning of the predicate 'is beautiful' in S's language; *being P* is the linguistic meaning of 'is beautiful' because members of S's linguistic community bear attitude A to Ps. (Sider, 2011, p. 57).

In our Mona Lisa example, then, by saying "the Mona Lisa is beautiful" the speaker is communicating the proposition that the Mona Lisa has some physical property *P* that the linguistic community has determined is the property that is predicated by 'is beautiful' in their language. The reason that the property of being *P* is used as the meaning of 'is

beautiful' by the linguistic community is that they all bear an attitude *A* to things that have property *P*.

What is property *P* and what is the attitude *A* that that linguistic community bears to things that have that property? Answering those questions is well beyond the scope of this dissertation and Sider does not attempt to answer them himself. What is important is that Sider contends that there could be different attitudes that a community could bear towards things that have property *P* and all of those attitudes would serve equally well for determining the meaning of 'is beautiful'. It just happens to be the case that that particular linguistic community bears attitude *A* towards things that have the property *P* like the Mona Lisa. Sider then explains:

> I do not claim that projectivism is true; it is, I suspect, an overly simplistic model of the semantics and metasemantics of 'beautiful'. It's point, rather, is to establish a general fact about the nature of subjectivity: there is a kind of subjectivity that results, not from statements in the target discourse being our values, but rather from our values selecting one from a range of equally good meanings. (Sider, 2011, p. 59)

The Projectivist account presented so far is subjective to the extent that our values, our attitude towards a certain property that some things have, are determining the candidate meaning 'is beautiful'. There are other values or attitudes, which we don't have, that would pick out other equally good candidate meanings for 'is beautiful'. Now, according to Sider, there might be other instances where we are not projecting our values *per se*, but we are projecting other important aspects of ourselves. His example of another possible type of projection of ourselves has to do with determining the meaning of 'causation'. Suppose that 'causation' does not cut nature at the joints and that there are other candidate meanings for 'causation' that all would allow us to achieve our semantic goals equally well. Suppose further that the choice between the different candidates is not

arbitrary. It could be the case that one of the candidate meanings for 'cause' is essential for the way that we understand the world. Sider says, "suppose, for instance, that it's essential to the role 'cause' plays in our conceptual scheme that it have a counterfactual analysis" (Sider, 2011, p. 60). If that were the case, then we could not chose a pure natural law account for the meaning of 'cause' even though it cuts nature at the joints equally well and would allow us to achieve our sematic goals (that is, if we had a different conceptual scheme).

We are now in a position to consider the Projectivist Humean's account of the meaning of 'necessary' and her answer to SNQ. First, we must determine if the Projectivist Humean's account of the meaning of 'necessary' is subjective because we bear a certain value-attitude towards certain truths or whether it is subjective because we are projecting some other important feature of ourselves, such as the role 'necessary' plays in our conceptual schemes (this distinction is not one that Sider considers when he discusses the meaning of 'necessity'). If the former, then we have a certain value-attitude towards a property that all of the mathematical and logical truths (the truths that Sider contends are good candidates) have that other truths, such as the truth of the proposition that there are at least two electrons in the universe. There are two things that we need to know about this subjectivist account of the meaning of 'necessary'. First, what is the value-attitude that we bear towards a property that all of the mathematical and logical truths have that other truths lack? Second, what is that property? We need to answer the second question first in order to answer the first question. Clearly we can't say that the property that all of the mathematical and logical truths have that other truths lack is that they are necessary. To do so would either (i) be circular, or (ii) presuppose some deeper

necessity that is primitive (it would be primitive since the Projectivist Humean theory of the source of necessity would not provide us with an account of the source of that deeper necessity). Maybe the property that all of the mathematical and logical truths have that other truths lack is that they are truths about the structure of the world – they carve nature at the joints. This answer, however, will not work for Sider, since he claims that our talk of electrons and other entities of physics also cut nature at the joints. The proposition that there are at least two electrons in the universe is true and cuts nature at the joints, but it is not necessarily true (at least not in the same sense that the proposition that 2 + 2 = 4 is necessarily true). So what could the property be? I have no idea. Nor do I have any idea of what the value-attitude is that we could take towards the truths that have that property. I will then leave it to the Projectivist Humean who thinks that the form of subjectivity involved with the meaning of 'necessary' is that we are bearing some value-attitude towards certain truths to flesh out these details and I will go on to discuss the other notion of subjectivity, which seems to me more plausible.

The notion of subjectivity that seems most plausible when it comes to considering the meaning of 'necessary' is that 'necessary' plays an important role in our conceptual lives. What role does it play? Stroud provides us with one possible answer to this question. Recall that Stroud contends that worlds where mathematical propositions and/or logical propositions are false are worlds that are unintelligible to us (since they are unintelligible, we do not have a choice of whether those truths are necessarily true – i.e. they are not necessarily true by convention). Now, for Sider, we first determine which sorts of truths are labeled 'necessary' and then we construct a model of abstract possible worlds based on those truths being true at every possible world in the model. The reason

for constructing this model is to facilitate our theorizing about other kinds of modality (e.g. *de re* modality).[53] Let's suppose for *reductio* that it is possible for us not to label the mathematical truths as 'necessary' and that the proposition that 40 + 50 = 30 is true at some possible world (since mathematical propositions are contingently true in this scenario). There are a number of ways in which this world is an unintelligible world. For one thing, how would weight work in that world? Once again, suppose that there is an inhabitant of that world that can only lift 40 pounds of weight. He comes across a box that weighs 40 pounds and another box that weighs 50 pounds. In that world the man can lift the 40-pound box and place it on top the 50-pound box. He can then proceed to lift both boxes that together weigh 30 pounds, even though he could not lift the 50-pound box by itself. How is that possible? This problem, and other similar problems, will make that model of possible worlds useless for theorizing about other modalities insofar as at least one of the worlds in the possible world category of that model is unintelligible, and if it is unintelligible, there is no way for us to know whether some modal proposition is true at that world. For example, if our purpose for building the model was to evaluate the claim that there are essential properties and our model has a possible world where the proposition that 40 + 50 = 30 is true, do objects have essential properties in that model? It is unclear whether they do or do not because who knows what properties hold in a world where the proposition that 40 + 50 = 30 is true. Hence, the meaning of 'necessary' when attached to a proposition is to pick out certain sorts of truths that play a crucial role

[53] Note that we would still build this model even if our goal were to show that there are either no necessary existents, no essential properties, or etc.

in our conceptual lives. One of the roles that they play is to make our theorizing about other modalities cogent.

Therefore, on this Projectivist Humean account we are the source of the necessity that makes certain necessary truths necessarily true. Unlike the Conventionalist Humean account, we do not arbitrarily select one of the candidate meanings for 'necessary' amongst all of the other candidate meanings (i.e. ones with other *sorts* of truths) that would also allow us to achieve our semantic goals. Rather, we non-arbitrarily select the candidate meaning that plays a crucial role in our conceptual lives (we can't make any sense of a situation in which one of the mathematical or, more controversially, one of the logical propositions is false) even though there are other candidate meanings that would allow us to achieve our semantic goals – that is, those other candidate meanings would allow us to achieve our semantic goals if our conceptual lives were different.

3.3.2 An Objection and a Response

One problem with this Projectivist Humean account of the source of necessity is its reliance on unintelligibility. There are a number of problems that have been raised against conceivability as a guide to what is metaphysical possible and what is metaphysically necessary. Likewise, there are similar problems with the Projectivist Humean's metaphysical account of the source of necessity based on unintelligibility. For instance, what exactly makes something unintelligible? Contradictions seem to be unintelligible. For example, a world where the proposition that it is raining and it is not raining is true is a world where it is raining and it is not raining. But how could it be raining and not raining? There are, however, other contradictions that do not seem to be

unintelligible (at least to a certain segment of the population). The double slit experiment seems to show that an electron can both be a particle and not be a particle (i.e. a wave).

Another problem with using unintelligibility as a foundation for applying the term 'necessary' to certain sorts of truths is that there is disagreement over what is intelligible and what is unintelligible. Take for example the continuum hypothesis – there is no set whose cardinality is between the cardinality of the integers and the real numbers. Some mathematicians find the continuum hypothesis to be intelligible and others find it to be unintelligible. If the sorts of truths that we use in the meaning of 'necessary' are used because they play an important role in our conceptual lives (allowing us to build models of possible worlds that are intelligible), then it doesn't appear that all of the mathematical propositions play that role in our conceptual lives. On the one hand, the mathematicians who find the continuum hypothesis intelligible will construct models where there is no set whose cardinality is between the cardinality of the integers and the real numbers at any possible world. The possible worlds in their models will be intelligible to them, but they won't be intelligible to the mathematicians who think the continuum hypothesis is false. On the other hand, mathematicians who find the continuum hypothesis unintelligible will construct models where there is a set whose cardinality is between the cardinality of the integers and the real numbers at all possible worlds. The possible worlds in their models will be intelligible to them, but those worlds won't be intelligible to the mathematicians who thing the continuum hypothesis is true. The respective models will be intelligible to there respective builders. Yet, only one of them can be correct if Sider is correct about the mathematical propositions cutting nature at the joints, and one of Sider's criteria for the meaning of 'necessary' is that the proposition is true.

So, in this case it does not appear that intelligibility or unintelligibility is guiding us in our use of 'necessary'.

There is an alternative formulation of the Projectivist Humean account that allows us to elude the problems associated with intelligibility and unintelligibility. This formulation is inspired by two passages towards the end of Wittgenstein's discussion of rule following in the *Philosophical Investigations*. According to Wittgenstein:

> 240. Disputes do not break out (among mathematicians, say) over the question of whether or not a rule has been followed. People don't come to blows over it, for example. This belongs to the scaffolding from which our language operates (for example, yields descriptions).
>
> 241. "So you are saying that human agreement decides what is true and what is false?" – What is true or false is what human beings *say*; and it is in their *language* that human beings agree. This is agreement not in opinions, but rather in form of life. (Wittgenstein, 2009, p. 94[e])

Instead of giving a detailed account of the conceptual role that the mathematical and logical truths play in our conceptual lives via the role they play in building model of possible worlds base on the unintelligibility of worlds where they are false, we should instead take as primitive that the mathematical and logical truths are central to our conceptual lives. In other words, our form of life makes only a select few of the many sorts of candidate truths for 'necessary' (the mathematical and the logical truths) that would fulfill the semantic role of 'necessary' viable for creatures like us. It doesn't really matter whether the continuum hypothesis is true or is false; either way it is clear that mathematical truths are central to our conceptual lives and excellent candidates for 'necessary'. We are the source of the necessity that makes necessary truths necessarily true insofar as the truths that we call 'necessary' play a crucial role in our conceptual lives. The reason that those truths play a crucial role in our conceptual lives is based in

our form of life – that's how we understand the world. This version of the Projectivist Humean account seems to me to be the most promising of all the Dependent Accounts of the source of necessity. In the next chapter I will present an objection to all Dependent Accounts of the source of necessity, including this version of the Projectivist Humean account.

Before getting to that, though, we should briefly discuss Sider's thoughts on the Conventionalist Humean account and the Projectivist Humean account of 'necessary' (our discussion won't be as brief as Sider's). Sider contends that it is most likely the case that neither account on its own is the correct account. According to Sider, "more likely, the truth [about whether the choice of which truths are labeled 'necessary' is arbitrary or non-arbitrary] is somewhere in between. But at any rate, the conceptual choice is not forced on us by facts" (Sider, 2011, p. 269). This is all that Sider says about the matter. The arguments Sider focuses on are more concerned with showing that (i) the fundamental structure of reality is nonmodal, and (ii) explaining how to fit various notions of modality into his theoretical framework without discussing whether it is by convention or projection. It seems to me that the choice to make the mathematical and logical truths necessary is non-arbitrary and I am basing this on the arguments that I presented against the Conventionalist Humean account above. I primarily focused on the mathematical and logical truths, which are Sider's preferred sorts of truths that are good candidates for being necessary. There are, however, other modal axioms that we select in Sider's account of necessity. According to Sider, we introduce these other modal axioms (e.g. a modal axiom concerning the necessity of analytic truths, a modal axiom

concerning the 'necessity' of necessary *a posteriori* truths, and a modal axiom for metaphysical necessity) when we want to talk about their respective forms of necessity.

If Sider is correct about there being both arbitrary and non-arbitrary applications of 'necessary', then the following proposition must be true:

> **PROPboth:** There are certain truths that are labeled 'necessary' by convention and there are other truths that are labeled 'necessary' by projection.

Now, it appears to me that PROPboth must be true if Sider is correct. If it were false, then either (i) no truths are labeled 'necessary' by convention, (ii) no truths are labeled 'necessary' by projection, or (iii) no truths are labeled 'necessary' by either convention or projection. If (i) or (ii), then Sider's claim that most likely there is a combination of the two is false. Furthermore, if (ii) is true, then the arguments I presented against the Conventionalist Humean account show that Sider's account of necessity is incorrect. Now, if (iii), then there is some other source of the necessity that makes necessary truths necessarily true (perhaps the fundamental structure of the world) since we do call truths "necessary". Since PROPboth must be true for Sider to correct about there being both conventions and projection, it seems like PROPboth is the sort of proposition that we would call "necessary". There are two ways in which a truth is labeled 'necessary'. Either that truth is the kind of truth that we arbitrarily chose (the Conventionalist Humean account) or that truth is the kind of truth that was non-arbitrarily adopted (the Projectivist Humean account). Was our choice arbitrary? Recall that to call a proposition "necessary" for the Conventionalist Humean means that that proposition is true and of a certain sort. There must also be alternative candidates that "…allow us to accomplish exactly the same semantic goal…" (Sider, 2011, p. 56). Now if PROPboth is true, then

the Conventionalist Humean account on its own cannot be an alternative candidate that allows us to achieve the exact same semantic goal (otherwise, PROPboth would be false). It also cannot be the case that the Projectivst Humean account on its own is an alternative candidate that allows us to achieve the exact same semantic goal (otherwise, PROPboth would be false). So what is the alternative candidate that allows us to accomplish the same semantic goal – to have an account of necessary truths that is compatible with Sider's non-modal structural realism? I'm not sure what it would be. Recall that according to Sider, there is a convention "…when the alternative choices stare us in the face…" (Sider, 2011, p. 56). There doesn't seem to be any alternative staring us in the face. So the Conventionalist Humean cannot account for PROPboth's necessity. Nevertheless, the Projectivist Humean can provide us with an account of PROPboth's necessity. There is something about us that makes it so we choose to label PROPboth as 'necessary'. What does this show us about the source of the necessity that makes necessary truths necessarily true? It shows us that if Sider is correct and PROPboth must be true, then the necessity of the fact that there are both truths whose necessity is by convention and truths whose necessity is by projection is rooted in the fact that we are a certain way – we are creatures who conceptualize the world in such a way that enables us to make some truths necessary by convention and to make some truths necessary by projection. So ultimately the source of the necessity of necessary truths is a projection of our conceptual natures.

3.4 Conclusion

In this chapter I presented various versions of Sider's Humean account of the source of the necessity that makes necessary truths necessarily true. Key for understanding Sider's

theory is understanding his account of fundamentality – the fundamental structure of the world is nonmodal. According to Conventional Humeanism, we label certain propositions as 'necessary' based on their (i) being true, and (ii) of a certain sort. The certain sort of truths that we happened to label 'necessary' via conventions, Sider contends, are the logical or mathematical truths. I raised two objections to the Conventional Humean account of the source of necessity. In the Incompleteness Objection, I showed that there are at least three propositions that must necessarily be true if Conventionalist Humeanism is correct. I then showed that Conventionalist Humeanism cannot provide us with an account of the source of the necessity of those necessarily true propositions. In the Stroud Objection, I showed that given Sider's notion of 'convention', the necessary truths cannot be necessary by convention insofar as we have no choice of which truths are labeled 'necessary' if we utilize possible worlds in our semantics to talk about other modalities (e.g. metaphysical modality), which is something that we do since we do use the term 'necessary'. I then considered the Projectivist Humean account of the source of necessity. I argued that using intelligibility (e.g. any world where the propositions of mathematics are false is an unintelligible world; hence, those propositions must be true at every possible world, which are all intelligible) as the criteria for which propositions are necessarily true is problematic insofar as there is no universal agreement on which worlds are intelligible or which worlds are unintelligible (which is the case with the disagreement over the Continuum Hypothesis). I then claimed that the most plausible Projectivist Humean account would be one based on Wittgenstein's account of form of life. Finally, I showed that a mixed Humean account, one that has both conventions and projections, suffers the same fate as Conventionalist

Humeanism – there is a proposition that must be necessarily true, if the mixed Humean account is accurate, yet the mixed Humean account cannot provide us with an explanation of the source of its necessity. Ultimately, I argued that if Sider is correct about a mixed Humean account, then the source of the necessity that makes necessary truths necessarily true will be a projection of our conceptual lives. In other words, mixed Humeanism collapses into Projectivist Humeanism. I will develop one last objection to all Humean Accounts, including the Projectivist Humean account that I think is most promising, in the next chapter – they are all incompatible with global modal error.

Chapter 4: Global Modal Error

4.0 Introduction

At the end of Chapter 3, I suggested that the most promising Dependent Account of the source of the necessity that makes necessary truths necessarily true is a Projectivist Humean account (in contrast to a conventionalist account) that takes as *primitive* the central roles of mathematics and logic in our conceptual lives. Let's call this account "Projectivist Humean Deflationism". According to the Projectivist Humean Deflationist, we are the source of the necessity that makes necessary truths necessarily true insofar as the truths that we label 'necessary' play a crucial role in our conceptual lives. The reason that those truths play a crucial role in our conceptual lives is based on our form of life – that's simply how we understand the world – and that is the end of the explanation. In other words, the exhaustive explanation for why the necessary logical and mathematical truths play a crucial role in our conceptual lives is to merely state: "That's how we understand the world." Projectivist Humean Deflationism avoids the pitfalls of relying on a reductive explanation of why the mathematical and logical truths play such a crucial role in our conceptual lives (such as relying on intelligibility) to the extent that (i) there is no need to explain why some contradictions are intelligible (e.g. *x* being a wave and not a wave – a particle) and why other contradictions are unintelligible (e.g. it's raining and it's not raining), and, more importantly, (ii) there is no need to account for disagreement on the intelligibility of certain propositions (e.g. the continuum hypothesis – some think it is intelligible and others think it is unintelligible).

In this chapter I will present a new structural objection to *all* Dependent Accounts of the source of necessity that is based on the genuine epistemic phenomenon of global modal error. The kind of modal error that I have in mind here is essentially the same as the modal error discussed by Stephen Yablo (1993) and George Bealer (2004), but in a different setting. They were primarily concerned with explaining how an individual can be mistaken about the modal profile of a proposition when either conceivability (Yablo) or our modal intuitions (Bealer) are supposedly good guides to what is necessary and what is possible. By 'global modal error', I have exclusively in mind a modal error that we as a collective make. I will argue that all Dependent Accounts of the source of necessity are incompatible with the phenomenon of global modal error. I am going to begin by describing the epistemic phenomenon of global modal error and argue that it is a genuine epistemic phenomenon. Next, I devise a generic Dependent Account of the source of necessity in order to provide us with a tool that we can use for an analysis of why all Dependent Accounts of the source of necessity are incompatible with the phenomenon of global modal error. After the general discussion, I explain in detail how each of the Dependent Accounts of the source of necessity discussed in earlier chapters are incompatible with epistemic phenomenon of global modal error. I begin by showing that the most promising Dependent Account of the source of necessity, the Projectivist Humean Deflationism, is incompatible with the phenomenon of global modal error (I also show Sider's version of Projetivist Humeanism is incompatible with global modal error in the interest of being thorough). After that I demonstrate that all *conventionalist* accounts of the source of necessity are also incompatible with the phenomenon of global modal error. Lastly, I consider two responses to my arguments – one based on focusing

on classes of truths instead of individual truths and the other based on using idealized versions of ourselves as the source of the necessity that makes necessary truths necessarily true.

4.1 Global Modal Error is a Genuine Epistemic Phenomenon

Modal error is an issue in the epistemology of modality. A modal error occurs when someone thinks that a proposition has a certain modal profile when it in fact has another modal profile. I take there to be three modal profiles that a proposition could have: (i) always true, (ii) never true, (iii) sometimes true and sometimes false. Let's consider the proposition that Gene Simmons is Chaim Witz to highlight two ways in which some can mistakenly think that a proposition has a certain modal profile when it actually has some other modal profile. First, there are a number of ways that a person could be mistaken about the *truth* of the proposition that Gene Simmons is Chaim Witz that will all cause that person to think that the proposition has a modal profile that it doesn't have. Let's suppose that Jon thinks that that proposition is necessarily false. Why might Jon think that that proposition is necessarily false? Jon might not know that the bass player for the band Kiss (in the actual world) has two names and therefore mistakenly thinks 'Gene Simmons' and 'Chaim Witz' refer to two different people. Let's suppose further that Jon believes that proper names are rigid designators. If Jon knew that 'Gene Simmons' and 'Chaim Witz' refer to the same person, he would think that the proposition is necessarily true. Errors concerning only the *truth* of propositions, like Jon's error, directly lead to modal errors – they involve mistakenly thinking that a proposition has a certain modal profile when it in fact has another modal profile. Jon thinks that proposition is necessarily false (i.e. the proposition is not true at any possible world) whereas the

proposition is actually necessarily true (i.e. the proposition is true at every possible world). Jon's error is rooted in the profile of the proposition's truth; nevertheless, this error does directly lead to Jon thinking that the proposition has a modal profile that it does not have. Another way in which someone can mistakenly think that a proposition has a certain modal profile that it doesn't have is based purely in mistakenly thinking that the proposition has modal profile that it doesn't have (e.g. thinking that a proposition is contingently true when it is in fact necessarily true). For example, someone might think that the proposition that Gene Simmons is Chaim Witz is only *contingently* true (i.e. true at some possible world but not true at all possible worlds). Let's suppose that Jill thinks that proposition is contingently true. There are a number of ways in which a person can mistakenly think the modal profile of the proposition that Gene Simmons is Chaim Witz is contingent.[54] Perhaps Jill fell asleep in her metaphysics class when her professor was talking about the necessity of identity and she hasn't given it much thought otherwise. Better yet, maybe Jill thinks that she has an argument that there is a possible world where Gene Simions is not identical to Chiam Witz (perhaps Jill thinks that a non-rigid, descriptive theory of names is the correct theory of the semantics of proper names or has devised an argument that supposedly shows identity is not a necessary relationship). Whatever is the case, her thought that this proposition is contingently true is incorrect since the name 'Gene Simmons' and the name 'Chiam Witz' both refer to the same person in every possible world; that is, if Kripke's arguments in *Naming and Necessity*

[54] I'm assuming that identity is necessary here. What if identity is not necessary? If that were the case, then I would be mistaken in thinking that the proposition that Gene Simmons is Chaim Witz is necessarily true. In other words, I would be guilty of a modal error.

are correct, which I am inclined to think. So the proposition that Gene Simmons is Chaim Witz is actually necessarily true. Modal errors of these sorts happen frequently.[55]

What we are interested in, though, is a modal error that we as a collective make – a global modal error. A global modal error occurs when a community mistakenly thinks that a proposition has a certain modal profile when the proposition actually has a different modal profile. For example, it was widely thought in the mathematical community that Alfred Kempe had proven the four-color conjecture in 1879.[56]

> **Four-color Conjecture (4CC):** In order to color any map on a plain or on the surface of a sphere in such a way that no two countries (regions) that share a boundary also share a color requires using four different colors to color the map.[57]

Since the mathematicians at that time accepted Kempe's proof of 4CC, they would have thought that the following proposition was contingently true (i.e. false at some possible world, but not false at every possible world):

> **PROPcolor**: Kempe proved 4CC using his actual 1879 proof.[58]

Why? Kempe did prove 4CC using his 1879 proof (it was thought – more on this shortly), but someone else might have come up with the proof that Kempe used to prove 4CC. In 1890, however, Percy Heawood found a flaw in Kempe's 1879 proof of 4CC.[59] In 1890, then, it was shown that PROPcolor is in fact false. But it is more than just simply false. Since PROPcolor is about Kempe's 1879 *mathematical* proof, it must be

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[55] See Yablo, 1993, pp. 33-36. The main problem with modal error, in this sense, is that it might be used as a challenge to the thought that conceivability is a good guide to possibility.
[56] Spika, 2002, pp. 21-23.
[57] I would like to thank Shay Logan for introducing me to the Four-color Conjecture.
[58] Note that 'his [Kempe's] actual 1879 proof' is a rigidified description that names (demarcates) the proof that Kempe devised in the actual world in 1879. This is important to the extent that I will explain shortly that PROPcolor is actually necessarily false and this would not be the case if 'his actual 1879 proof' is not rigidified. It is certainly plausible that Kempe *could have* devised a proof in 1879 that does prove 4CC.
[59] See Spika, 2002, pp. 23, 26.

false at every possible world. There is no possible world where Kempe proved 4CC using his 1879 proof. So, we went from thinking that PROPcolor was true in some possible world but not true in all possible worlds to knowing that PROPcolor was false in all possible worlds. We were mistaken, then, when we thought PROPcolor was contingently true in 1879 – we erroneously thought that PROPcolor had a modal profile (true at some possible world but not true at every possible world) that it did not have.[60]

Why should I assume that we were collectively making a mistake when we thought PROPcolor was contingently true? First, in the past, we have been collectively wrong about a number of things. We mistakenly thought that the earth is flat, the sun orbits the earth, etc. We've therefore thought that the proposition that the earth is flat is true and the proposition that the sun obits the earth is true, etc. If we can be mistaken about these things, especially mistakenly thinking that certain propositions are true when they are in fact false, it certainly seems plausible that we can collectively be mistaken about the modal profile of some proposition. Second, and more importantly, the alternative is implausible. To say that we cannot be mistaken about the modal profile of

[60] We could modify the example slightly to produce a case where the mathematicians were only mistaken about the modal profile of a proposition (this requires focusing on the mathematicians in 1890). Let's suppose, for the sake of argument, that the truths of mathematics are contingent. This might not seem so outlandish to the Conventionalist – especially Carnap. Recall that for Carnap linguistic framework choice is not a matter of correct or incorrect, but a matter of degree. The choice of which mathematical linguistic framework to adopt is based on practical considerations (as opposed to theoretical considerations such as this is the *correct* mathematical system). If we get to choose which mathematical linguistic framework that we adopt, then there are no necessary, necessary mathematical truths (to have such mathematical truths would mean that those truths are true outside of a linguistic framework, which is impossible according to Carnap). Now, in the scenario above the mathematicians in 1890 thought that PROPcolor was necessarily false. However, if mathematical truths are only contingently true, then PROPcolor is only contingently false. There certainly are some really odd mathematical system (e.g. like Kripke's quss system) and surely there must be one in which Kempe's actual 1879 proof does prove 4CC. Now, we haven't adopted that mathematical system, but this is due to that system being less practical than the mathematical system that we have adopted (it is not due to that system being incorrect). So, in this scenario, the mathematicians in 1890 were making a mistake when they thought PROPcolor was false in all possible worlds insofar as the mathematical truths are contingently true and PROPcolor is only false is some possible worlds.

some proposition is to say that it's impossible for us to be mistaken about its modal profile. Yet, this is not the case. At one point in time, the ancients collectively thought that Hesperus was not identical to Phosphorus. Given some simple reflections on identity, it is reasonable to assume that they would have thought that it is impossible for Hesperus to be identical to Phosphorus.[61] So they would have thought that the proposition that Hesperus was destroyed and Phosphorus was spared could only be contingently false. Now, if it is impossible for us to be mistaken about the modal profile of a proposition, then for the proposition that Hesperus was destroyed and Phosphorus was spared to be contingently false, the names 'Hesperus' and 'Phosphorus' must refer to different objects in all possible worlds. The problem is 'Hesperus' and 'Phosphorus' both refer to the same object in every possible world (despite the fact that the ancients *thought* that they referred to different objects) and the proposition that Hesperus was destroyed and Phosphorus spared is necessarily false. Hence, the ancient would have been mistaken about the modal profile of the proposition that Hesperus was destroyed Phosphorus was spared.

4.2 Generalized Analysis of the Incompatibility of Dependent Accounts of the Source of Necessity and Global Modal Error

In this section I'll show that every Dependent Account of the source of necessity is incompatible with global modal error and provide a diagnosis as to why they are incompatible with that phenomenon. To do this, we need a generic Dependent Account

[61] Peter Hanks has pointed out to me that the ancients might have been confused about the necessity of identity and thought it was possible for Hesperus to be Phosphorus, even though that wasn't the case. This means that they mistakenly thought the proposition that Hesperus is identical to Phosphorus is only contingently false. Even if this is the case, the ancients are still mistaken about the modal profile of the proposition. They erroneously thought propositions concerning identity are contingent.

of the source of necessity – one that serves as a type for all of the token Dependent Accounts of the source of necessity that I will be examining later in this chapter as well as any other token Dependent Account of the source of necessity that might be devised. Now, the common feature of all of the Dependent Accounts of the source of necessity, not surprisingly, is they all ground the source of necessity in some human practice or capacity – be it our practice of having conventions or some psychological capacity that we possess. Given that that is the case, we can devise a generic dependent principle of the source of necessity:

> **Generic Dependent Account (GDA):** Humans are the source of the necessity that makes necessary truths necessarily by way of human factor X.

The 'human factor X' in this definition serves as a placeholder that is to be filled in with some human practice or capacity (even if the capacity is just that that is the way we do things, as is the case in Projectivist Humean Deflationism). In this way, all of the Dependent Accounts of the source of necessity that will be discussed shortly are all GDA accounts and any other account of the source of necessity that is a Dependent Account (which all claim we are, in some way or other, the source of the necessity that makes necessary truths necessarily true) is also a GDA account.

The reason why GDA is incompatible with the epistemic phenomenon of global modal error is that that theory of the source of necessity (once the details of human factor X are filled in) doesn't provide us with a basis for comparison. Having a basis for comparison is essential for our concept of error. For example, consider a piano student who is at his piano lesson learning to play "Chopsticks". The piano teacher first plays some notes for the student and then has her student play some notes. Suppose that the

student plays notes that his teacher did not play. Now, both are trying to play "Chopsticks" (i.e. each has the intention to play "Chopsticks"), so how do we know that the student is making a mistake and not his teacher? There is no way to tell who is making the mistake if there is no basis for comparison. It is certainly the case that they played different notes, but whose notes are the "correct" notes cannot be determined without a basis for comparison. For all we know, without a basis of comparison, both the student and the teacher played "incorrect" notes. There is, however, a basis for comparison in this case – the original composition of "Chopsticks." If the student is playing notes that don't appear in the original composition, the student is making a mistake. If the teacher plays notes that don't appear in the original composition, then she's making a mistake. If both the student and the teacher are playing notes that don't appear in the original composition, then they are both making mistakes. By having a basis for comparison, we are able to determine whose performance of "Chopsticks" contains errors.

GDA type accounts of the source of necessity cannot provide us with a basis of comparison when it comes to evaluating global modal error because they all collapse metaphysical modality into a subjective modality – something like epistemic modality. Epistemic modality deals with what is necessary and what is possible based on a subject's knowledge. We could characterize epistemic modality in the following way.

Necessity: *S* is epistemically necessary for population *P* at time t_1 iff given everything that *P* knows at t_1, *S* must be the case.

Possibility: *S* is epistemically possible for population *P* at time t_1 iff given everything that *P* knows at t_1, S might be the case.

By claiming that there is some human practice or capacity which serves as the source of the necessity that makes necessary truths necessarily true, GDA type accounts of the source of necessity are all describing metaphysical modality in terms of a subjective modality like epistemic modality. If we tie metaphysical modality to some subjective modality the way that GDA type accounts of the source of necessity do, then we cannot account for global modal error. Why? There is no way that we can be mistaken about the modal status of any proposition insofar as we determine the modal status of every proposition.

As a quick, slightly more specific, example, let's consider Neo-conventionalism (Neo-conventionalism will be discussed in more detail in Section 4.4.2) and the Kempe scenario. Recall the four-color conjecture:

> **Four-color Conjecture (4CC):** In order to color any map on a plane or the surface of a sphere in such a way that no two countries (regions) that share a boundary will have the same color requires using only four different colors.

And the proposition about Kempe's proof:

> **PROPcolor**: Kempe proved 4CC using his actual 1879 proof.[62]

Under the Neo-conventionalist's theoretical framework (where we divide up the worlds into the possible worlds and the impossible worlds based on our interests) there is no way for the mathematicians in 1890 to say that the mathematicians in 1879 made a mistake when they thought PROPcolor was contingently true. This is due to there being no basis for comparison within the Neo-conventionalist theoretical framework because it is built on subjective modality like epistemic modality. All the Neo-conventionalist can say is

[62] Keep in mind that 'actual' is being used as a rigidifier here and that 'proof' does not mean that Kempe proved 4CC with his argument.

that the mathematicians in 1879 correctly divided up the worlds based on their interests and the mathematicians in 1890 correctly divided up the worlds differently based on their interests. There was no error. More generally, all that GDA type accounts of the source of necessity can say about the Kempe scenario is that PROPcolor was contingently true for the mathematicians in 1879 based on human factor X and PROPcolor was necessarily false for the mathematicians in 1890 based on human factor X. The mathematicians in 1879 could not have been mistaken about PROPcolor being contingently true to the extent that if PROPcolor was actual necessarily false in 1879, then the mathematicians did not determine the modal status of PROPcolor using human factor X in 1879, which contradicts the GDA type account of the source of necessity. Hence, for all GDA type accounts (i.e. Dependent Accounts of the source of necessity) it will be the case that there is a change in the modal status of PROPcolor. In 1879 it is contingent and in 1890 it is necessary. Since there is a change in PROPcolor's modal status, every Dependent Account of the source of necessity is incompatible with global modal error to the extent that if there were a global modal error in 1879, then there could be no change in PROPcolor's modal status (i.e. PROPcolor would have to be necessarily false in 1879).

4.3 Projectivist Accounts of the Source of Necessity and Global Modal Error

In this section I will argue that both Projectivist Accounts of the source of necessity that I have presented are incompatible with the genuine phenomenon of global modal error. I begin by showing what I consider to be the most promising dependent account of the source of necessity – Projectivist Humean Deflationism – is incompatible with global modal error. I then consider Sider's Projectivist account of the source of necessity and

argue that it is also incompatible with global modal error. I'll be using the four-color conjecture scenario in what follows.

4.3.1 Projectivist Humean Deflationism is Incompatible with Global Modal Error

The Projectivist Humean Deflationism account of the source of necessity is a deflationary theory in a number of respects. First, it is based on Sider's general deflationary Humean account of the source of necessity – the fundamental structure of the world is non-modal. There is no joint in nature that divides the truths/falsehoods into necessary truths/falsehoods and contingent truths/falsehoods.[63] In Projectivist Humean Deflationism, then, the fundamental structure of the world is also non-modal. We are not tracking some natural distinction with our term 'necessary'; rather, there is something about us that makes it so we label certain propositions 'necessary'. Why do we label certain propositions as 'necessary'? According to the Projectivist Humean Deflationist, those propositions express truths and falsehoods that play an important role in our conceptual lives. Which brings us to the second way in which Projectivist Humean Deflationism is deflationary – there is no explanation (e.g. something like an intelligible/unintelligible explanation of the truth/falsity of mathematical, logical, and certain metaphysical propositions) of the importance that those truths/falsehoods we call 'necessary' play in our conceptual lives. The reason those truths/falsehoods play a crucial role in our conceptual lives is based in our form of life – that's how we understand the world. And that is all that can be said. So we (humans) are the source of the necessity that makes necessary truths necessarily true (and necessary falsehoods

[63] You will have noticed that I am now talking about necessary truths and necessary falsehoods explicitly. This dichotomy has always been in the background – it is clear that the proposition 2 + 3 = 7 is necessarily false. I'm talking about necessary falsehoods in an effort to be more precise.

necessarily false) – we call certain truths and falsehoods 'necessary' because they play an unanalyzable, yet important, role in our conceptual lives.

Let's now reconsider the four-color conjecture example through the lens of the Projectivist Humean Deflationist account of the source of necessity. After the wide acceptance of Kempe's proof of 4CC in 1879, we labeled the truth of PROPcolor 'contingent' to the extent that it did not fulfill an important, yet unanalyzable, role in our conceptual lives (recall that the only the truths and falsehoods that we label 'necessary' are those that play an unspecifiable, yet important, role in our conceptual lives).[64] Later, in 1890, Heawood showed that Kempe's proof of 4CC was flawed which made PROPcolor false. Given the unspecified conceptual role that mathematical truths and falsehoods play in our conceptual lives, we labeled the falsehood expressed by PROPcolor as 'necessary'. According to the Projectivist Humean Deflationist, then, it must be the case that in 1890 PROPcolor started to play an important, yet unspecified, role in the conceptual lives of the mathematicians at that time, which caused them to label the falsehood expressed by PROPcolor as 'necessary', that it was not playing in the conceptual lives of the mathematicians in 1879.

For the Projectivist Humean Deflationist, it cannot be the case that the mathematicians in 1879 erroneously labeled the modality expressed in PROPcolor as 'contingent'. Why? First, they thought that PROPcolor was true. Since we determine the modal profile of propositions based on the important, yet unanalyzable, conceptual

[64] Why think that we label each individual mathematical truth as necessary? Doesn't it seem more reasonable to think that we adopt a whole class of propositions/truths (e.g. the mathematical truths) and label them all as necessary? There would then be truths or falsehoods, like the one expressed in PROPcolor, that get their modality by way of being entailed by the mathematical axioms that we have adopted. I consider this possible response in Section 4.5.1.

role that they play in our lives, the mathematicians in 1879 correctly labeled the PROPcolor given the role that it played in their conceptual lives. Second, the only possible error that the mathematicians in 1879 could have made concerning the modal profile of PROPcolor would have to be an error associated with how those mathematicians determine the modal profile of the truths and falsehoods of mathematics *based on the important, yet unanalyzable, role* that truths and falsehoods play in their conceptual lives. Let's suppose for *reductio* that there is some error associated with how the mathematicians in 1879 determine the modal profile of the truths and falsehoods *based on the important, yet unanalyzable, role* that those truths and falsehoods play in their conceptual lives. If there were such an error, then PROPcolor would be necessarily false in 1879 despite the fact that the mathematicians labeled it 'contingent'. Yet, if PROPcolor is necessarily false in 1879, then the mathematicians in 1879 did not determine its modal profile by labeling it as so based on the important, yet unanalyzable role, it played in their conceptual lives. We've run into a contradiction. For the Projectivist Humean Deflationist, the modal profile of all truths and falsehoods is determined by the important, yet unanalyzable, role that they play in our conceptual lives. Hence, for the Projectivist Humean Deflationist, it cannot be the case that the mathematicians in 1879 mistakenly labeled the truth expressed by PROPcolor as 'contingent' when they thought that it was true; and the mathematicians in 1890 didn't correct a mistake by labeling PROPcolor as 'necessary' when they found out it was false. Projectivist Humean Deflationism is therefore incompatible with the phenomenon of global modal error.

4.3.2 Sider's Projective Humeanism is Incompatible with Global Modal Error

I have just shown that Projectivist Humean Deflationism is incompatible with global modal error. It turns out that Sider's Projective Humeanist account of the source of necessity is also incompatible with global modal error. Recall that for Sider, Projectivism (simpliciter) is subjective in the sense that the choice between equally good candidate meanings for a term is not arbitrary. Sider explains, "a sentence is subjective, then, in the sense illustrated by the projectivist semantics, if and only if its truth-value depends on which of a range of equally joint-carving candidates is meant by some term in the sentence, where the candidate that we in fact mean was selected in a way that is not arbitrary, but rather, reflects something important about us, such as our values" (Sider, 2011, p. 59). Recall that for Sider, 'necessary' just means 'true and of a certain sort'. When it comes to 'necessary', then, our choice of its meaning reflects something important about us. This suggests that there is a need for an explication of why these sorts of truths fall under the category 'necessary'. What does the choice of the truths that we have labeled as 'necessary' reflect about us?

In Chapter 3, I argued that the most plausible analysis of the importance of the truths we label 'necessary' is the role that they play in our conceptual lives. I developed the Projectivst Humean account based on some of Stroud's ideas in his article "Wittgenstein and Logical Necessity". Stroud explains that it often seems like there are alternative candidate conventions for many things that we do and think, at least when we consider them in isolation. However, when we actually consider a world where we adopted one of the supposed alternative candidate conventions as a whole, that world is unintelligible to us. For the Projectivist Humean, this unintelligibility takes on the role of

explaining why we label certain truths 'necessary'. According to the Projectivist Humean, the reason why the truths expressed in logical and mathematical propositions (along with some truths expressed in metaphysical propositions) are labeled 'necessary' is that in any scenario, or world, in which any one of those propositions is false is unintelligible. For the Projectivist Humean, then, we (humans) are the source of the necessity that makes necessary truths necessarily true (and necessary falsehoods necessarily false) to the extent that we label certain truths and falsehoods 'necessary' because of the important role that they play in our conceptual lives.

Now let's consider the four-color scenario through the lens of Projectivist Humeanism. The mathematicians in 1879 thought that Kempe had proven 4CC with his actual 1879 proof. Since 4CC is a proposition that expresses a mathematical truth and propositions that express mathematical truths play an important role in our conceptual lives (i.e. their falsity is unintelligible)[65], the mathematicians in 1879 would have labeled the truth expressed by 4CC as 'necessary'. Since the mathematicians in 1879 thought that Kempe's actual 1879 proof proved 4CC (a necessary proposition), they would have thought that it proved 4CC in all possible worlds.[66] Now, the fact that Kempe came up with that particular proof 1879 does not play an important role in our conceptual lives. A world where Kempe doesn't construct that proof is an intelligible world. So, the mathematicians in 1879 would have thought the truth expressed by PROPcolor is

[65] If PROPcolor were false, would that be unintelligible to us? It doesn't seem as though it would unintelligible to us. This problem with the Projectivist Humean account of the source of necessity was discussed in Chapter 3. It does seem like a genuine problem with this account. Let's suppose, for the sake of argument, that if PROPcolor were false, that would be unintelligible to us.

[66] Recall, according to Sider we introduce abstract possible worlds after we determine which truths are necessary. The possible worlds are the worlds where all the propositions that express necessary truths are true (Sider, 2011, p. 288).

contingent – someone else could have devise Kempe's actual 1879 proof. In other words, a world where PROPcolor is true is an intelligible world and a world where PROPcolor is false is an intelligible world for the mathematicians in 1879. Now, when Heawood showed in 1890 that there is a flaw in Kempe's actual 1879 proof, the mathematicians would have thought that the truth of PROPcolor is unintelligible. If the truth of PROPcolor is unintelligible, then PROPcolor is necessarily false.

Can the Projectivist Humean provide us with an account of the mistake that the mathematicians made when they thought that PROPcolor was contingently true in 1879? The Projectivist Humean could say that the mistake the mathematicians made in 1879 was accepting Kempe's actual 1879 proof. Since PROPcolor is about the proof of a necessary mathematical proposition, 4CC, and the mathematicians in 1879 mistakenly thought that Kempe had created a proof that proved 4CC, they would have mistakenly thought that PROPcolor is contingently true. The mathematicians learned of their mistake when Heawood showed that there is a flaw in Kempe's actual 1879 proof in 1890. When they learned about the flaw in Kempe's actual 1879 proof, they knew that PROPcolor is actually false. If PROPcolor is false, then Kempe didn't prove 4CC with his actual 1879 proof. Since PROPcolor is about Kempe's use of a mathematical proof to prove a mathematical proposition, they knew that PROPcolor was necessarily false. The mathematicians, therefore, would have known in 1890 that they had made a mistake when they thought that PROPcolor was contingently true in 1879.

The problem with this account of the modal error concerning PROPcolor in 1879 is that it undermines the Projectivist Humean's account of the source of necessity. The mathematicians in 1879 thought that the truth expressed in PROPcolor was intelligible

(that is why they thought it was contingently true). If the truth of PROPcolor was actually unintelligible in 1879, which would have to be the case if the mathematicians in 1879 were mistaken about the truth of PROPcolor, then PROPcolor was necessarily false in 1879. If PROPcolor is necessarily false in 1879, then it is necessarily false even though the mathematicians didn't label it as 'necessary' in 1879. If PROPcolor is necessarily false even though they didn't label it as so in 1879, they did not determine its modal profile in 1879 based on what is intelligible and what in unintelligible to them. In other words, the intelligibility or unintelligibility of the truth of a proposition does not determine that proposition's modal profile, which directly contradicts the Projectivist Humean's account of the source of necessity. And this argument generalizes. If the mathematicians in 1879 made a mistake (whatever that might be) when they thought that PROPcolor was contingently true, then PROPcolor was actually necessarily false in 1879 despite what the mathematicians in 1879 found to be intelligible or unintelligible. If PROPcolor's modality is not determined by what we find to be intelligible or unintelligible, then the Projectivist Humean's account of the source of necessity is incorrect. Hence, the Projectivist Humean cannot say that the mathematicians in 1879 made a mistake when they thought that PROPcolor was contingently true in 1879 and they did not fix a mistake in 1890. Therefore, Projectivist Humeanism is incompatible with global modal error.

4.4 Conventionalist Accounts of the Source of Necessity and Global Modal Error

In this section I am going to argue that conventionalist accounts of the source of necessity are incompatible with global modal error. I begin with a quick explanation of why the traditional Conventionalists accounts of the source of necessity are incompatible with

global modal error. I then show that Neo-conventionalism and Conventional Humeanism are both incompatible with global modal error. Once again, I'll be using the four-color scenario. For your convince, recall the four-color conjecture:

> **Four-color Conjecture (4CC):** In order to color any map on a plane or the surface of a sphere in such a way that no two countries (regions) that share a boundary will have the same color requires using only four different colors.

And the proposition about Kempe's proof:

> **PROPcolor**: Kempe proved 4CC using his 1879 proof.

4.4.1 Conventionalism is Incompatible with Global Modal Error

The unsophisticated description of the Conventionalists' account of the source of necessity begins with the observation that according to the Conventionalists, the only truths that are necessarily true are the analytic truths, which are generated by convention. Since the analytic truths are generated by convention, they are true by convention. If analytic truths are true by convention, they could never be false. Hence, the analytic truths are necessarily true by convention.

I presented a more robust Conventionalist account of the source of necessity that was extracted from the work of Rudolf Carnap in Chapter 1. Recall that for Carnap, a sentence is necessarily true when it meets his Convention Condition: a sentence is necessarily true when its truth can be established on the sematic rules of the linguistic framework alone – i.e. without appeal to anything outside of the linguistic framework (Carnap, 1956b, p. 10). According to Carnap, we construct these linguistic frameworks by introducing predicates for the new kind of entities that we want to talk about and variables for those predicates (which stand as placeholders for those entities). We then formulate rules for how these new predicates are to be used within the linguistic

framework (Carnap, 1956a, pp. 206-7). Importantly, especially for our purposes, the choice of which framework to adopt is not theoretical – there is no 'correct' linguistic framework. Rather, which linguistic framework we choose is based on practical considerations (ease of use, helps in accomplishing what we wanted to accomplish by introducing the new terms, etc) (Carnap, 1956a, p. 214). For Carnap, then, we are the source of the necessity that makes necessary truths necessarily true insofar as (i) the only truths that are necessarily true meet the Convention Condition, and (ii) we choose which linguistic framework to adopt based on practical considerations; hence, we choose which truths are necessary true.

Let's now consider the four-color conjecture example through the lens of Carnap's Conventionalism. In 1879 we adopted a linguistic framework in which PROPcolor is contingently true (after the wide acceptance of Kempe's actual proof of 4CC). Let's call that linguistic framework "P-Linguistic Framework". Why think that we adopted a new linguistic framework in 1879? Our acceptance of Kempe's proof signifies our adoption of the linguistic framework that he was working in – the P-Linguistic Framework. The P-Linguistic Framework contains the rules that Kempe was using when he created his proof – rules that determine how the predicates are used in the P-Linguistic Framework. If we did not adopt the P-Linguistic Framework in 1879, then we would not have accepted Kempe's actual 1879 proof insofar as we would not have accepted the rules that he used in deriving his proof. Now, after Heawood's discovery of a flaw in Kempe's actual 1879 proof in 1890, we abandoned the P-Linguistic Framework that we had adopted in 1879 (the linguistic framework in which PROPcolor is

contingently true) and adopted another linguistic framework in which PROPcolor is necessarily false.

It cannot be the case that we mistakenly adopted P-Linguistic Framework in 1879 for the Conventionalist. First, let's try to understand how we could mistakenly adopt a linguistic framework. Keep in mind that there is no *correct* linguistic framework for us to choose (having a correct linguistic framework would make linguistic framework selection a theoretical matter, which, according to Carnap, it isn't). Carnap contends that linguistic framework selection is based on practical considerations that come in degrees – linguistic framework A may be more practical than linguistic framework B and so we choose linguistic framework A. Now, the mathematicians could have mistakenly chosen the P-Linguistic Framework in 1879 when there was another linguistic framework that was more practical that we could have chosen. But that doesn't seem to be the case. Given the mathematicians' acceptance of Kempe's actual 1879 proof, it seems as though the P-Linguistic Framework is the most practical linguistic framework when it comes to the desire to prove 4CC. Nevertheless, let's suppose for *reductio* that we did somehow mistakenly adopt the P-Linguistic Framework in 1879. If we mistakenly adopted the P-Linguistic Framework in 1879, then PROPcolor is necessarily false. If PROPcolor is necessarily false, then the actual linguistic framework that the mathematicians are using in 1879 is not the P-Linguistic Framework to the extent that PROPcolor is contingently true in that linguistic framework. If the mathematicians were not using the P-Linguistic Framework in 1879, then they did not mistakenly adopt the P-Linguistic Framework in 1879 (even if they thought that they adopted it). Contradiction! We are supposing that the mathematicians mistakenly adopted the P-Linguistic framework 1879, but if

PROPcolor is actually false, then they could not have mistakenly adopted the P-Linguistic Framework in 1879. The linguistic framework that they adopted in 1879 is one where PROPcolor is necessarily false (recall that according to the Conventionalist, we determine which propositions are necessarily true and which propositions are necessarily false via our choice of linguistic framework). Hence, it cannot be the case that they mistakenly adopted the P-Linguistic Framework in 1879 and we did not correct a mistake by choosing a different linguistic framework in 1890. Therefore, Conventionalism is incompatible with the phenomenon of global modal error.

4.4.2 Neo-conventionalism is Incompatible with Global Modal Error

Recall that according to Cameron, in his article "On the Source of Necessity," the correct answer to SNQ is: The necessary truths are necessarily true because they are true at every possible world. Cameron explains that if we answer SNQ this way (using the modal notion of possible worlds in our answer to SNQ), then SNQ boils down to a question about possible worlds: What do all of the possible worlds have that the impossible worlds lack? I called that question the "Possible Worlds Question" (PWQ). Cameron gives us is a deflationary answer to PWQ: The possible worlds do not have anything that the impossible worlds lack. There is no natural distinction between the possible worlds and the impossible worlds. It is simply the case that the possible worlds are possible and the impossible worlds are impossible (Cameron, 2010, p. 148).

This appears to be a rather uninformative answer to PWQ. Cameron's goal is to make his deflationary answer to PWQ an informative answer and how he supposedly does this is through Neo-conventionalism. The principles of Neo-conventionalism are:

(1) Necessary truths are necessary because they are true at every possible world.

(2) Both possible worlds and impossible worlds are abstract objects.

(3) There is a non-natural distinction between the possible and the impossible worlds. (Cameron, 2009, p. 13)

Principle (1) marks the difference between traditional Conventionalism and Neo-conventionalism. As explained above, Traditional Conventionalists (Non-neo-conventionalists) claim necessary truths are analytic, and are therefore necessary *and* true by convention. This is clearly not the case for the Neo-conventionalist. Principle (3) is crucial for the Neo-conventionalist thesis and it is where convention comes in. First, Cameron denies that there is some special ontological distinction between the possible worlds and the impossible worlds (i.e. natural distinction) that we are latching onto when we talk about possible and impossible worlds. Cameron explains, "the deflationist holds that there is nothing ontologically special about this distinction as opposed to the myriad of other distinctions that we could of latched on to" (Cameron, 2009, p. 15). Second, Cameron claims we are responsible for dividing the worlds into the possible worlds and the impossible worlds.[67] According to Cameron, we do not divide up the worlds

[67] More carefully, as explained in Chapter 2, Cameron claims there is a non-natural, yet mind-independent distinction between the possible worlds and the impossible worlds Let me explain. What I think Cameron has in mind here is that there is a collection (i.e. set – call it "*S*") of abstract objects (worlds) that are already divided into multiple complementary subset-pairs. Each of these complementary subset-pairs has a possible world subset and an impossible world subset. [How many complementary sub-pairs are there? The Neo-conventionalist must acknowledge that for all the possible ways in which the worlds in *S* can be divided, there is a corresponding complementary sub-pair. If this weren't the case, then Neo-conventionalism would not provide us with an account of the source of the necessity for all necessary truths. For example, suppose that the proposition that 2 + 2 = 5 is not true at any possible world in any possible world subset of any complementary subset-pair of *S*. If that were the case, then Neo-conventionalism would fail to explain the source of the necessity of the necessarily true proposition that there is no possible world subset of any complementary sub-pair of worlds in *S* where the proposition that 2 + 2 = 5 is true at a possible world. The source of that proposition's necessity is not rooted in conventions to the extent that there is no complementary subset-pair of *S* that we could choose where the proposition that 2 + 2 = 5 is true; rather, the source of that proposition's necessity is rooted in the structure of *S*. In other words, it would appear that nature is carved at the joints. What makes Cameron's Neo-conventionalist answer to PWQ non-natural (and, importantly, his answer to SNQ dependent) is that we

haphazardly; rather, we have principled reasons for dividing up the worlds the way we do. We divide up the worlds based on our interests and if our interests change, we could decide to divide up the worlds differently (Cameron, 2009, p. 13). It is through this non-natural answer to PWQ that the Neo-conventionalist's answer to SNQ is dependent. We decide which worlds are possible worlds and which worlds are impossible worlds based on our interests. Hence, we decide which truths are necessary truths via our selection of which worlds will be the possible worlds.

Is the Neo-conventionalist account of the source of necessity compatible with the phenomenon of global modal error? We'll see that it isn't. Let's begin by reconsidering the four-color conjecture example through the lens of Cameron's Neo-conventionalist account of the source of necessity. In 1879 we divided up the worlds (based on our interests) in such a way that PROPcolor was false at some possible world, but not false at every possible world (after the wide acceptance of Kempe's proof of 4CC).[68] Later, in 1890, Heawood showed that Kempe's proof of 4CC was flawed and we divided up the worlds (based on our interests) in such a way that PROPcolor is false at every possible world. For the Neo-conventionalist, then, it must be the case that our interests changed in 1890, which caused us to divide up the worlds differently (this must be the case because the Neo-conventionalist claims that we divide up the worlds based on our interests). Yet,

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have chosen, based on our interests, which of the already existing complementary sub-pairs to latch on to based on our interests and we could have chosen differently – so we choose which truths are necessary and which truths are contingent via our selection of which complementary sub-collection to use. In the body of this chapter I will use phrases like "we divide up the worlds into the possible worlds and the impossible worlds" in an attempt to not muddle the discussion, but these ways of explaining the process should be understood as explained here.

[68] How is this possible given that Kempe's proof of 4CC is actually false? Remember that the actual world is also an abstract object that corresponds to the world we live in. The mathematicians at that time thought that some other world (an impossible world in this case) was the actual world and that that world corresponds to the world we live in.

it is hard to see just how our interests changed between 1879 and 1890 – it seems like we were interested in proving 4CC at both times. Maybe the Neo-conventionalist can account for this change in interests by including Kempe's proof as part of our interests in 1879. In 1879 the mathematicians were interested in proving 4CC and Kempe's proof of it, and they divided up the worlds accordingly (which made PROPcolor false at some possible world, but not every possible world). In 1890 the mathematicians' interests changed after Heawood's discovery. In 1890 they were still interested in proving 4CC, but were no longer interested in Kempe's proof, and they divided up the worlds accordingly (which made PROPcolor false at every possible world). Let's assume that this is what happened.

For the Neo-conventionalist, it cannot be the case that we erroneously divided up the worlds in 1879. Why? The only possible error we could have made concerning the modal status of PROPcolor would have to be an error associated with how we divide up the worlds *based on our interests* in 1879. After all, according to the Neo-conventionalist, we determine the modal status of every proposition by dividing up the worlds based on our interests and it is the modal status of PROPcolor that is in question. What could this error that is somehow tied to the way we divided up the worlds *based on our interests* in 1879 be? I will not speculate on what it could be.[69] Whatever it is, one thing is clear – having such an error around would be problematic for the Neo-conventionalist.

[69] A plausible suggestion is that the error that the mathematicians in 1879 were making was that they erroneously thought some impossible world was the actual world that corresponds to the world that we live in. What follows is not reliant on an Actualist interpretation of modality.

Let's suppose for *reductio* that there is an error somehow tied to the way we divided up the worlds based on our interests in 1879. If there is an error somehow tied to the way we divided up the worlds based on our interests in 1879, then PROPcolor is actually false at every possible world in 1879, despite what we think our interests are in 1879. How else could we be mistaken about the modal status of PROPcolor in 1879 other than thinking it was false only at some possible world when it was in fact false at all possible worlds? Yet, if PROPcolor is false at all of the possible worlds in 1879, then we did not divide up the worlds based on our interests in 1879. We've run into a contradiction. For the Neo-conventionalist, the possible worlds are possible because we divide up the worlds based on our interest, so it cannot be the case that PROPcolor is false at every possible world in 1879. Hence, for the Neo-conventionalist, it cannot be the case that we mistakenly divided up the worlds in 1879 and we didn't correct a mistake by dividing up the worlds differently in 1890. Neo-conventionalism is therefore incompatible with the phenomenon of global modal error.

4.4.3 Conventionalist Humeanism is Incompatible with Global Modal Error

Sider's Conventionalist Humean account of the source of necessity differs from Cameron's Neo-conventionalism both ontologically and semantically. For Cameron, the abstract worlds exist and the necessary truths are necessarily true because they are true at every possible world in the possible world subset of the complementary subset-pair that we have latched on to based on our interest. As explained in Chapter 3, according to Sider, the fundamental structure of the world is non-modal – i.e. there are no abstract worlds that are divide up in to possible worlds and impossible worlds in the fundamental structure of the world (Sider, 2011, p. 267). The necessary truths are necessarily true

because we have decided, by convention for the Conventionalist Humean, that certain sorts of truths should be labeled 'necessary'. For Sider, the certain sorts of truth that we have labeled as 'necessary' are the mathematical and logical truths, but we could have chosen other truths to label as 'necessary' (Sider, 2011, p. 269). After we have decided which truths to label 'necessary', we then introduce abstract worlds to further theorize about other kinds of modality (e.g. *de re* modality) by making the abstract worlds where all of the truths that we have labeled 'necessary' are true the possible worlds (Sider, 2011, p. 288).

Now, for there to be a convention, Sider explains that there must be other candidates that we could have chosen that carve nature at the joints equally well (Sider, 2011, p. 56). Since the fundamental structure of the world is non-modal, all of the possible candidates that we could have label as 'necessary' carve nature at the joints equally well, which makes the choice between which truths to label as 'necessary' arbitrary (recall, the "choice" is not arbitrary for the Projectivist Humean). We will, however, have certain semantic goals for labeling certain truths as 'necessary'. So why have we labeled these truths as 'necessary'? For Sider, it is simply the case that we decided that those truths should be labeled 'necessary' – there is no single feature that all of the propositions that we have labeled as 'necessary' share that explains why these propositions are necessary (Sider, 2011, p. 288).[70] I think that we can do better than this.

[70] Sider does go on to explain that the Humean might be able to give a partial answer. Many of the most notable necessary truths are thought to be *a priori*. It is also inconceivable to think of many of the most notable necessary truths as false. However, Sider explains, "So some unification of the class of modal axioms [i.e. necessary truths] is possible. But a Humean will live with some disunification. She will be willing to admit that there is no one feature that all the modal axioms have in common. The spirit of Humeanism, after all, is that the line between the necessary and contingent is not discovered, but rather drawn by us – perhaps somewhat arbitrarily" (Sider, 2011, p. 289). I take this to mean that there is no one clear semantic goal for labeling propositions as 'necessary' according to Sider. Nevertheless, they do all

The most evident semantic goal with labeling certain truths as 'necessary' is to introduce possible worlds to evaluate other modal claims. I think that it is reasonable to assume that labeling certain truths as 'necessary' is in large part determined by our interests (akin to Cameron's claim about the processes of choosing a complementary subset-pair to latch on to) even though Sider does not clearly state that this is the reason why we have chosen these particular truths to label as 'necessary'. Hence, the reason why we label mathematical and logical truths as 'necessary' is that we have the interests that we have. If we had other interests, we would have labeled other truths as 'necessary'.

Sider's Conventionalist Humean account of the source of necessity is incompatible with global modal error. To see why this is the case, let's begin by reconsidering the four-color conjecture example through the lens of the Conventionalist Humean's account of the source of necessity. The mathematicians in 1879 read Kempe's proof of 4CC and decided that he had proven 4CC. Now, according to Sider, "the spirit of Humeanism … is that the line between the necessary and contingent is not discovered, but rather drawn by us – perhaps somewhat arbitrarily" (Sider, 2011, p. 289).[71] Let's suppose, then, one of the arbitrary decisions that the mathematicians in 1879 made was to label 4CC, which they thought was true, as 'necessary'. This is in line with our practice of labeling certain sorts of truths, the mathematical truths, as 'necessary'.[72] Let's suppose

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share one feature – they all play an important role when it comes to our interests. If they didn't play an important role, we wouldn't bother thinking that they must be true and labeling them as 'necessary'.

[71] Recall that arbitrariness is a sign of convention for Sider. If the line between necessary and contingent was not discovered *and* not arbitrary, then the Projectivist Humean account of the source of necessity would be the correct account.

[72] Sider has two criteria for labeling a proposition as 'necessary' – (i) it is true, and (ii) it is of a certain sort. It turns out that 4CC is true – this was proven quite a bit later with the assistance of computers. So it turns out that, by sheer luck, the labeling of 4CC as 'necessary' by the mathematicians in 1879 is compatible with Sider's criteria. But what would have been the case if it had turned out that 4CC was false? This is an interesting question. One possible response is that there are a multitude of different mathematical systems

further that the mathematicians in 1879 are not really all that interested in the creators of mathematical proofs – i.e. they don't deeply care about who comes up with the proof; rather, they care about the proof. So, the mathematicians in 1879 would not have labeled the truth, so they thought, expressed by PROPcolor as 'necessary'.

In 1890, Heawood showed that there was a flaw in Kempe's 1879 proof of 4CC. What, then, is the modal status of PROPcolor in 1890 under the guise of Conventionalist Humeanism? The mathematicians in 1890 knew that Kemps proof of 4CC is erroneous, so they knew that PROPcolor is false. But is it necessarily false or contingently false? This is an interesting question and I think that there are a two ways in which a Conventionalist Humean might answer it. One not so promising way to answer it would be to strictly follow what Sider says about necessary propositions. Strictly speaking, according to Sider, "to say that a proposition is necessary, according to the Humean view, is to say that the proposition is i) true; and ii) of a certain sort" (Sider, 2011, p. 269). Since PROPcolor is not true, thereby not meeting criterion i), it is not necessary. Yet, if PROPcolor is only contingently false, then it is possible that Kempe's 1879 proof of 4CC proves 4CC. But that doesn't seem possible – if Kempe's 1879 proof doesn't prove 4CC, then how could it prove 4CC? The second, more promising, way in which to answer the question of whether PROPcolor is necessarily false or contingently false would be to appeal to the fundamental structure of the world. We have to give up Sider's idea that necessary proposition are only true, but that seems like a perfectly reasonable thing to do.[73] Now, given that 4CC is a mathematical proposition, it is the sort of proposition that

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and in one of those systems 4CC is true. In this scenario, then, the mathematicians would have been using a different mathematical system (one that didn't correspond with the actual world) in 1879 than we use.

[73] This point was discussed in great detail in a footnote in Chapter 3.

mathematicians in 1890 would have labeled 'necessary'. If the truth expressed in 4CC is necessary, then any mathematical proof that doesn't prove it necessarily doesn't prove it. Why? Mathematical proofs logically entail their conclusions. Kempe's 1879 proof of 4CC does not logical entail its conclusion – 4CC. Since logical entailment is the sort of thing that the mathematicians in 1890 would have considered to be necessary, any mathematical proof that doesn't logical entail its conclusion necessarily doesn't do so. Hence, for the mathematicians in 1890, it is necessarily the case that Kempe's 1879 proof does not logically entail 4CC, which makes PROPcolor necessarily false, since PROPcolor is about Kempe proving 4CC with his actual 1879 proof. The mathematicians in 1890, then, would have thought that PROPcolor is necessarily false.

Can the Conventionalist Humean provide us with an account of the global modal error that the mathematicians in 1879 made when they mistakenly thought that PROPcolor was contingently true? I'll argue that Conventionalist Humean cannot provide us with an account of any error associated with the modality of PROPcolor due to the separation of modality from truth (via the arbitrary choice of which truths and falsehoods are labeled 'necessary') within her theory. First, though, I need to highlight a possible tension between Sider's account of conventions, his Conventionalist Humean account of having an arbitrary choice of which truths (and, I'll add, falsehoods) are labeled 'necessary', and his claim that the logical and mathematical truths are part of the fundamental structure of reality (this will play a crucial role in my argument). According to Sider, the decision to label certain truths (and falsehoods) as 'necessary' is arbitrary. Since the decision is arbitrary, it's conventional. Remember that for Sider, "… 'conventional' seems most apt when the arbitrary choice is made more or less

consciously, when alternative choices stare us in the face, and when those choices accomplish *exactly* the same semantic goal; it seems less apt when the choice has been made implicitly and collectively, over time, when no one thinks much about the alternatives, and when the alternatives accomplish slightly different semantic goals" (Sider, 2011, p. 56). So, for there to be an convention concerning which truths are labeled 'necessary' there needs to be alternative choices 'that stare us in the face' that accomplish the exact same semantic goal.

What exactly is our semantic goal with labeling mathematical truths (and falsehoods) as necessary? To answer this question, we need to keep in mind the two criteria for labeling a proposition as 'necessary' that Sider provides: (i) the proposition is true (and I'll add false), and (ii) of a certain sort. Now, according to Sider, certain mathematical and logical truths (and falsehoods) are part of the fundamental structure of reality (they cut nature at the joints).[74] There is, then, a *correct* logic and there is a *correct* mathematics. It is tempting to think that our semantic goal with labeling the logical and mathematical truths (and falsehoods) as 'necessary' is to track those sorts of truths (and falsehoods). If our semantic goal with 'necessary' is to track the logical and mathematical truths (and falsehoods) that are products of the correct logic and the correct mathematics, then there are no alternative choices that 'stare us in the face' when it

[74] It's important to note that Sider does not really take a stand on the actual, or "correct", fundamental logical and mathematical structure of reality (i.e. he does not argue for one side or the other) in *Writing the Book of the World* – that is not his project. It could be classical, intuitionist, or some other kind. Nevertheless, the fact that there is a question about which is the "correct" fundamental logical and mathematical structure of reality makes that debate a substantive metaphysical debate. According to Sider, "certain debates over the 'correct' logic are genuine [i.e. substantive]; they are as substantive as ontological debates" (Sider, 2011, p. 8). And the same goes for the debate over which is the "correct" mathematical system. These debates are substantive, according to Sider, to the extent that the debate is cast in perfectly joint-carving terms (Sider, 2011, pp. 47-8).

comes to which truths (and falsehoods) that are labeled 'necessary'. The only truths (and falsehoods) that can be labeled 'necessary' with that semantic goal are the truths (and falsehoods) that are products of the correct logic and the correct mathematics.[75] Hence, if our semantic goal with the label 'necessary' is to track the truths (and falsehoods) that are products of the correct logic and the correct mathematics, then labeling certain truths as 'necessary' is not conventional insofar as there are no alternative choices to choose from. A further problem with having the semantic goal of the label 'necessary' to be to track the logical and mathematical truths (and falsehoods) that result from the correct logic and the correct mathematics is that those truths (and falsehoods) cut nature at the joints. If the purpose of 'necessary' is to track those truths (and falsehoods) and this is all there is to necessity, then modal terms do cut nature at the joints. Hence, it cannot be the case that our semantic goal with the label 'necessary' is to track the truths (and falsehoods) that result from the correct logic and the correct mathematics. To avoid this tension, then, it must be the case that our semantic goal with the label 'necessary' is more general. As argued above, it seems that our use of the label 'necessary' is closely related to our interest. If we weren't interested in mathematics, then we wouldn't label mathematical truths as 'necessary'. So our semantic goal with the label 'necessary' is to highlight those truths (and falsehoods) that play an important role in our interests.

We are now in a position to see that Conventionalist Humeanism is incompatible with global modal error. Let's suppose for *reductio* that the mathematicians in 1879 were

[75] This in itself seems odd. There are certainly mathematical systems that we would never consider to be correct (in the sense that they accurately model the mathematical structure of reality). Nevertheless, their axioms do necessarily entail certain truths. The truths that those axioms entail would be consider necessary within their respective mathematical systems. Think of Kripke's quss operation. Within that mathematical system, the proposition that $68 \oplus 57 = 5$ is necessarily true given the axiom for quss.

making a mistake when they thought that PROPcolor was contingently true when it was actually necessarily false. If the mathematicians in 1879 made a mistake in labeling PROPcolor as 'contingent' (a global modal error), then PROPcolor is actually labeled 'necessary' in 1879 despite what the mathematicians think at that time. How could that be? The only response that appears to be available to Conventionalist Humean is that in the Kempe scenario it is the case that the mathematicians in 1879 were mistaken about the truth of PROPcolor – Kempe's actual 1879 proof of 4CC does not prove 4CC (at least it doesn't prove 4CC in the mathematical system that we think is "correct"). If mathematical truths are labeled 'necessary' and Kempe's actual 1879 proof of 4CC does not prove 4CC, then PROPcolor cannot be true. In other words, the fact that Kempe's actual 1879 proof of 4CC does not prove 4CC logically entails (necessarily) that PROPcolor is necessarily false. This response won't work. The problem with this explanation is that it relies on us tracking the truths (and falsehoods) that are products of the *correct* logic and the *correct* mathematics with the label 'necessary'. The only way for PROPcolor to have the label 'necessary' without the mathematicians applying that label to it is for the fundamental structure of the world to be modal. How else would it be labeled as 'necessary' without the mathematicians in 1879 labeling it as so? But this contradicts the Conventionalist Humean's claim that the fundamental structure of the world is non-modal. Hence, Conventionalist Humeanism is incompatible with global modal error.

4.5 Two Responses and Replies to those Responses

In this section I will consider two responses to my claim that dependent accounts of the source of necessity are incompatible with global modal error. I will explain each

response using the generic dependent principle of the source of necessity given in Section 4.2. I'm doing this because the Projectivist Humean Deflationist, the Projectivist Humean, the Conventionalist, the Neo-conventionalist, or the Conventionalist Humean could use these responses. Recall, that the generic dependent principle of the source of necessity is:

> **Generic Dependent Account (GDA):** Humans are the source of the necessity that makes necessary truths necessarily by way of human factor X.

I will reply to those responses in a similar fashion. The first response that I will consider is based on focusing on classes of truths instead of individual truths. The second response that I will consider is based on using idealized versions of ourselves as the source of the necessity that makes necessary truths necessarily true.

4.5.1 Classes of Truths are the Subjects of Analysis[76]

RESPONSE: In all the arguments that supposedly show that various dependent accounts of the source of necessity are incompatible with global modal error (with the possible exception of the arguments used against the Humean accounts of the source of necessity) you are focusing on the modal status of the truth expressed by a single proposition – PROPcolor. This makes it seem as though we determine the modal status of every truth expressed by a proposition individually via human factor X. Your arguments show that this cannot be the case; however, this is not the way in which dependent accounts of the source of necessity work. Rather than determining the modal status of the truths expressed by propositions individually via human factor X, we determine the modal

[76] This response is developed from a response that Richard Teaque presented against my arguments in "Neo-conventionalism and Global Modal Error," which is a paper that I presented at the 2018 American Philosophical Association's Central Division Meeting in Chicago on February 22nd, 2018.

status of the truths expressed in whole classes of propositions via human factor X. In the Kempe scenario, we first adopted a set of mathematical principles and then determined via human factor X that the class of all mathematical truths that follow from those mathematical principles are necessarily true. Now, we will not know all of the mathematical truths that follow from the mathematical principles that we have adopted when we determine that that class of all mathematical truths are necessarily true, nor will we know all of consequences that follow from those mathematical truths – such as PROPcolor. Nevertheless, we have determined that all of the mathematical truths are necessarily true via human factor X. We therefore have a basis of comparison.

We can now show that dependent accounts of the source of necessity are compatible with global modal error. The mathematicians in 1879 adopted a set of mathematical principles and determined via human factor X that all of the truths that follow from those mathematical principles are necessarily true. When Kempe introduced his procedure for proving 4CC (which is not very complicated, but hard to apply thoroughly), the mathematicians were not fully aware of all the consequences that followed from that procedure. They did, however, think that Kempe's actual 1879 proof of 4CC proved 4CC. So they would have thought that PROPcolor was contingently true. Now, in 1890 Heawood discovered a consequence of Kempe's procedure that was not known in 1879 – Heawood came up with a map that Kempe's procedure failed to work on. The mathematicians in 1890, then, knew there was a flaw in Kempe's actual 1879 proof of 4CC (via Heawood's counterexample) and would have thought that PROPcolor was necessarily false (there is no possible world where Kempe uses his actual 1879 proof of 4CC to prove 4CC). Further, the mathematicians in 1890 would have thought that the

mathematicians in 1879 were making a mistake when they thought that PROPcolor was contingently true. They would be justified in thinking this because PROPcolor was actually necessarily false in 1879, given the class of mathematical proposition that follow from the mathematical principles that they had adopted were determined to be necessary via human factor X, even though the mathematicians in 1879 *thought* it was contingently true. The mathematicians in 1879 were mistaken about the modal status of PROPcolor because they weren't fully aware of the consequences of the mathematical principles that they adopted in 1879. Hence, dependent accounts of the source of necessity are compatible with epistemic phenomenon of global modal error.

REPLIES: There are three good replies to this response. The replies require careful consideration of the factors that are prominent in the Kempe scenario as given in the response. The first factor is the adoption of a set of mathematical principles. The second factor is the wide acceptance of Kempe's actual 1879 proof of 4CC by the mathematicians in 1879. The first two replies show that using this tactic to account for global modal error makes whichever Dependent Account of the source of necessity that is being modified an incomplete account. The last reply shows that this response does not cohere with Dependent Accounts of the source of necessity.

For the first reply, I'll show that the response gives us an incomplete account of the source of necessity and is in fact circular. The circularity of the response will become evident once we uncover what is required for the response to work. The acceptance of Kempe's proof is evidence that the mathematician's in 1879 at the very least *thought* that a certain set of mathematical principles proves 4CC. Now, there certainly are inconsistent mathematical principles that prove 4CC. Our question, then, becomes which

set of principles was adopted by the mathematicians in 1879? Did they adopt the mathematical principles that make PROPcolor necessarily false, or did they adopt an inconsistent set of mathematical principles that makes PROPcolor contingently true? For the response to work, it must be the case that the mathematicians adopted the set of mathematical principles that make PROPcolor necessarily false. If they had adopted the inconsistent set of mathematical principles, PROPcolor would have been contingently true in 1879 and there would have be no global modal error.

If it must be the case that the mathematicians adopted the set of mathematical principles that make PROPcolor necessarily false, which is required for the response to be cogent, then we have another necessary truth that needs to be accounted for:

> **PROPnoChoice:** If there was a global modal error, then the mathematicians in 1879 had to choose the mathematical principles that make PROPcolor necessarily false.

What is the source of PROPnoChoice's necessity? The source of PROPnoChoice's necessity does not follow from the mathematical principles that the mathematicians adopted in 1879, since those principles would not entail that they had to be chosen in 1879 if there was a global modal error. So, if a dependent account of the source of the necessity that makes necessary truths necessarily true is correct, then the source of PROPnoChoice's necessity must be human factor X. I will, however, show that human factor X is not the source of PROPnoChoice's necessity.

Let's begin by evaluating what would happen if PROPnoChoice was determined to be contingently true via human factor X. If it were only contingently true via human factor X, then it would be possible for the mathematicians in 1879 to choose some other mathematical principles that do not make PROPcolor necessarily false, yet there was still

a global modal error. If they were to choose the mathematical principles that do not make PROPcolor necessarily false in 1879, that would mean that PROPcolor is either necessarily or contingently true, or contingently false in 1879.

On the one hand, if PROPcolor is necessarily or contingently true via the mathematical principles that were adopted in 1879, then Kempe proved 4CC using his actual 1879 proof. If Kempe proved 4CC using his actual 1879 proof, then the mathematical principles that were adopted in 1879 were inconsistent. In 1890, then, the mathematicians adopted a different set of mathematical principles after Heawood introduced his counterexample. If this were the case, then there would be no global modal error since they were working with different sets of mathematical principles. Hence, if PROPcolor is either contingently or necessarily true in 1879, then the Dependent Account of the source of necessity is incompatible with the phenomenon of global modal error.

On the other hand, if PROPcolor is contingently false via the mathematical principles that were adopted in 1879, then Kempe could have proved 4CC using his actual 1879 proof. But if Kempe could have proved 4CC using his actual 1879 proof, then the mathematical principles that were adopted in 1879 must be inconsistent (since Kempe's actual 1879 proof does not prove 4CC in any consistent set of mathematical principles). In 1890, then, the mathematicians adopted a different set of mathematical principles after Heawood introduced his counterexample. If this were the case, then there was no global modal error. Hence, if PROPcolor is contingently false, then the Dependent Account of the source of necessity incompatible with the phenomenon of global modal error.

Therefore, it cannot be the case that PROPnoChoice is determined to be contingently true via human factor X to the extent that if PROPnoChoice is contingently true, then the Dependent Account of the source of necessity is incompatible with global modal error (which is counter to the claim made in the response). Yet, the reason that PROPnoChoice cannot be determined to be contingently true via human factor X has nothing to do with human factor X. If there were no such thing as global modal error, then there would be no problem with PROPnoChoice being contingently true. What makes it the case that PROPnoChoice cannot be determined to be contingently true via human factor X is that if that were possible, then the Dependent Account of the source of necessity would be incompatible with the phenomenon of global modal error. In other words, if the Dependent Account of the source of necessity is compatible with the phenomenon of global modal error, then PROPnoChocie is necessarily true. Hence, the source of PROPnoChoice's necessity is the global modal error that occurred in 1879 – the mathematicians mistakenly thinking that PROPcolor was contingently true when it was in fact necessarily false – and not human factor X. Hence, any Dependent Account of the source of necessity that is compatible with global modal error on the grounds given in the response is an incomplete account of the source of necessity.

In addition, PROPnoChoice's necessity being rooted in the in the instance of global modal error in 1879 leads to the problem with circularity. The only way for there to be a global modal error in 1879, according to the dependent account of necessity, is for it to necessarily be the case that PROPcolor is false in 1879. But the only reason that PROPcolor is necessarily false in 1879 is because PROPnoChoice is necessarily true. The reason why PROPnoChoice is necessarily true is that there was a global modal error

in 1879. But there was a global modal error in 1879 because PROPcolor was necessarily false in 1879. But PROPcolor is necessarily false only because PROPnoChoice is necessarily true. *Ad infinitum*. Therefore, we have an instance of circular reasoning. Ergo, PROPnoChocie must be necessarily true if the response is cogent; yet, the source of its necessity is not located in human factor X, which is contra to the Dependent Account of necessity. The source of PROPnoChoice's necessity must be located in the instance of the global modal error; yet, if it is, then the response is circular.

The second reply is Quinean in nature. According to the account of global modal error given in the response, we choose a set of mathematical principles and from this set of mathematical principles, certain mathematical truths follow or are entailed by those mathematical principles. These mathematical truths that follow or are entailed by the mathematical principles are, as a class, determined to be necessary via human factor X (even if we don't know them). Now, those mathematical truths *necessarily* follow from the mathematical principles that were adopted. For example, given the principles of classical mathematics, it *necessarily* follows that the proposition that 2 + 2 = 4 is true. What is the source of that necessity? It cannot be human factor X. The proposition that 2 + 2 = 4 necessarily follows from the principles of classical mathematics whether we decide to recognize that necessity via human factor X or not. In other words, given the adoption of the principles of classical mathematics, it is necessarily the case that the proposition that the proposition 2 + 2 = 4 follows from those principles. In addition, the source of the necessity of the proposition that 2 + 2 = 4 are the principles of classical mathematics, since that proposition necessarily follows from the principles of classical mathematics. More generally, then, the necessary truths that follow from mathematical

principles necessarily follow from those mathematical principles whether we decide to recognize that necessity via human factor X or not. The source of the necessity of the truths that necessarily follow from the mathematical principles are the mathematical principles, not human factor X. Hence, there are necessary truths (e.g. the necessary truth that 2 + 2 = 4 necessarily follows from the principles of classical mathematics) whose necessity is not dependent on human factor X. Therefore, saying that we adopt a set of mathematical principles and then determine via human factor X that the class of mathematical truths that follow from those mathematical principles are necessary is incorrect. We do not determine that those mathematical truths *necessarily* follow from the mathematical principles. We also do not determine the *necessity* of the truths that necessarily follow from the mathematical principles via human factor X – the source of those truths' necessity are the mathematical principles. Hence, the Dependent Account of the source of necessity that tries to account for global modal error in this way is an incomplete account of the source of necessity to the extent that there are necessities whose source is not human factor X.

For the last reply, I'll show that the response undercuts the significance of the acceptance of Kempe's actual 1879 proof. What the response fails to take into account is the effect that Kempe's actual 1879 proof of 4CC has on the mathematical principles that were adopted in 1879 and the commitments of the Dependent Account of the source of necessity. The response is taking for granted that the original principles that the mathematicians adopted in 1879 are not themselves being revised; however, there is no reason to think that the original principles are not being revised given new evidence. Given what the mathematicians take to be as new evidence 1890 – Heawood's

counterexample to Kempe's actual 1879 proof of 4CC – they would have revised the original principles that they had adopted in 1879. They did, after all, think that Kempe had proven 4CC with his actual 1879 proof in 1879, which entails a certain set of mathematical principles (inconsistent, but still principles), and they thought that Heawood had shown an error with Kempe's actual 1879 proof, which entails that they needed to revise their original principles.

So, how do we account for the effect that Kempe's actual 1879 proof had on the mathematical principles that were adopted by the mathematicians in 1879? There are two, slightly different, replies. The first reply is that the mathematicians made implicit revisions to the original principles after the wide acceptance of Heawood's demonstration of the error in Kempe's actual 1879 proof in 1890.[77] Call this "the Implicit Revision Account." Let me explain how this account works. The mathematicians in before 1879 adopted a certain set of mathematical principles. They then read Kempe's actual proof of 4CC and accepted it. Since there was wide acceptance of Kempe's actual 1879 proof of 4CC, the mathematicians made implicit revisions to the original mathematical principles that had adopted before 1879. Why would they make implicit revisions to the mathematical principles that they had adopted? To avoid inconsistency. They made adjustments to those mathematical principles to bring them in line with Kempe's actual 1879 proof of 4CC that they had accepted – to bring them in line with their interests. They thought Kempe had proven 4CC with his actual 1879 proof, so the implicit revisions that they made were in line with their interests. This revision produced a new

[77] I would like to thank Peter Hanks for suggesting this reply and helping me articulate the last reply. Any confusion in them is solely mine.

set of truths (and falsehoods), which are closely aligned with their interests, that the mathematicians would have determined to be necessarily true (and false) via human factor X. Since they implicitly revised their original mathematical principles, PROPcolor would be contingently true (this must be the case, because they thought that Kempe's 1879 proof proved 4CC). In 1890, after Heawood's discovery of the flaw in Kempe's 1879 proof, the interests of the mathematicians changed, and they implicitly revised their mathematical principles to avoid inconsistency once again. In 1890, then, the mathematicians had a new set of truths (and falsehoods) that they determined to be necessarily true via human factor X. In 1890, then, PROPcolor would have been necessarily false. The mathematicians in 1879 were not making a mistake when they thought PROPcolor was contingently true – the mathematical principles that they were using changed and they correctly determined its modal status based on their interests.

The second reply is that the mathematicians reinterpreted (as opposed to revised) the original principles that they had adopted in 1879 after their wide acceptance of Kempe's actual proof of 4CC.[78] Let's call this "the Reinterpretation Account." Let me explain how this account is supposed to work. The mathematicians in 1879 were working with a set of mathematical principles that they had previously adopted. They did not know all of the consequences of these principles, so they would not have known what propositions that they entail. Nevertheless, they would have thought that the propositions that these mathematical principles entail are necessarily true via human factor X (since we are supposing that some Dependent Account of the source of necessity is correct).

[78] One example of interpreting mathematical principle is interpreting '+' as either plus or quss. We get different mathematical truth depending on which interpretation of '+' that we adopt.

Now, in 1879 the mathematicians thought that Kempe had proven 4CC with his actual 1879 proof. The mathematicians in 1879 then interpreted their mathematical principles in such a way that 4CC came out true (via Kempe's actual 1879 proof of 4CC). Since all the propositions entailed by the set of mathematical principle are necessarily true via human factor X, 4CC would have been necessarily true via human factor X. This is in accordance with the general claim made by those who champion dependent accounts of the source of necessity – there is something about us that determines the modal status of propositions – so those theorist can avoid the problem that I raised earlier with the given response. Now, since 4CC is necessarily true because of Kempe's actual 1879 proof, PROPcolor would have been contingently true and the mathematicians in 1879 would have thought as much. In 1890, Heawood convinced the mathematicians that there was something wrong with Kempe's actual 1879 proof of 4CC. In other words, Heawood convinced them that some other interpretation of the mathematical principles was the one that they should adopt, which they did. Since the mathematicians in 1890 reinterpreted the mathematical principles, they would have had a different set of propositions entailed by those mathematical principles. They would have thought the propositions entailed by that interpretation of the mathematical principles were necessary via human factor X. Hence, the mathematicians would not have known if 4CC was true or false, given the new interpretation of the mathematical principles, but they would have known that PROPcolor was necessarily false. Were the mathematicians in 1879 then mistaken about the modal status of PROPcolor? No – under their interpretation of the mathematical principles, the propositions entailed by those mathematical principles would have been

necessary (via human factor X) and the truth of 4CC (via Kempe's actual 1879 proof of 4CC) would have entailed that PROPcolor was contingently true.

Now, is either the Implicit Revision Account or the Reinterpretation Account of the events that happen in the late eighteen hundreds more compelling than the account given in the response (that the mathematicians adopted a set of mathematical principles that made PROPcolor false and that Heawood showed in 1890 that Kempe's proof did not follow from the adopted principles)? I think that they are both more compelling if we keep in mind the motivation behind Dependent Accounts of the source of necessity. The motivation behind the Dependent Accounts of the source of necessity is to counter claims that there is a natural distinction that determines which truths are necessary and which truths are contingent. The whole point of Dependent Accounts of the source of necessity, then, is to locate that necessity in some human factor X. Now, if it turns out that just by adopting some mathematical principles a whole slew of truths become necessary, then it appears that human factor X is not doing much work. It certainly may be the case that we decided via human factor X to make the mathematical principles necessarily true (as is contended in the response), but the fact that certain other truths necessarily follow from the necessary mathematical principles has nothing to do with human factor X. We have no choice in whether those truths necessarily follow from the necessary mathematical principles that we have adopted. If we have no choice in the matter, then the necessity of those truths following from the necessary mathematical principles we have adopted is not located in human factor X. Now, this is not the case for both the Implicit Revision Account and the Reinterpretation Account. On the Implicit Revision Account, we make implicit revisions to the mathematical principles that we have adopted to bring them in

line with the truths (or falsehoods) that we have determined to be necessarily true (or false) via human factor X. On the Reinterpretation Account, we reinterpret the mathematical principles that we have adopted to bring them in line with the truths (or falsehoods) that we have determined to be necessarily true (or false) via human factor X. Hence, both the Implicit Revision Account and the Reinterpretation Account are more in line with the motivation behind Dependent Accounts of the source of necessity. If this is correct, then Dependent Accounts of the source of necessity are incompatible with global modal error.

4.5.2 The Idealizers

RESPONSE: The reason why dependent accounts of the source of necessity are not compatible with the phenomenon of global modal error is that there is no basis for comparison between the different times in those theories. As argued above, having a basis for comparison is essential for our concept of error. Dependent accounts of the source of necessity do not provide us with a basis for comparison insofar as in those accounts we are responsible for determining the modal status of every proposition (or set of propositions) at all times. If we determine the modal status of every proposition (or set of propositions) at all times, we can never be wrong about any of their modal statuses. There is, however, a way to modify these dependent accounts of necessity so that they do provide us with a basis for comparison. All that we need to do is to claim that the modal status of every proposition is determined by idealized versions of ourselves – let's call these idealized versions of ourselves "Idealizers." The Idealizers have none of our flaws or limitations. They know which mathematical system is the "correct" one (if there is one), they know absolutely everything that is entailed by the mathematical system they

have adopted, they can do calculations that we could never do, and they have a clear understanding of their intentions. As we will see, these modified accounts will provide us with a basis of comparison.

Instead of reconstructing every dependent account of the source of necessity discussed thus far, we'll focus on the Generic Dependent Account of the source of necessity (GDA). Let's begin, then, by modifying the GDA in such a way that the source of the necessity that makes necessary truths necessarily true are the Idealizers. Recall that GDA is:

> **Generic Dependent Account (GDA):** Humans are the source of the necessity that makes necessary truths necessarily by way of human factor X.

Recall that "human factor X" is filled in using either the criterion in one of the dependent accounts of the source of necessity or some other human capacity. The idealized version of GDA will be:

> **Idealized Generic Dependent Account (IGDA):** The Idealizers are the source of the necessity that makes necessary truths necessarily by way of idealized human factor X.

By changing GDP in this way, the source of the necessity that makes necessary truths necessarily true is no longer us – mere average humans. The Idealizers are the source of the necessity that makes necessary truths necessarily true. Nevertheless, IGDA is in the same spirit as GDA (i.e. the idealized versions of the dependent accounts of the source of necessity are in the same spirit as the non-idealized versions of those accounts). There is no natural distinction between the truths that are contingent and the truths that are necessary.

Let's consider again the Kempe scenario under the lens of IGDA. Recall the four-color conjecture:

> **Four-color Conjecture (4CC):** Any map on a plane or the surface of a sphere can be colored in such a way that no two countries that share a boundary will have the same color.

And the proposition about Kempe's proof:

> **PROPcolor**: Kempe proved 4CC using his actual 1879 proof.

The mathematicians in 1879 *thought* that 4CC was necessarily true after the wide acceptance of Kempe's actual 1879 proof. In other words, the mathematicians in 1879 *thought* that the Idealizers had made 4CC necessarily true via idealized human factor X. The mathematicians in 1879 would have *thought*, then, that PROPcolor was contingently true – i.e. they would have *thought* that the Idealizesr had made PROPcolor contingently true via idealized human factor X. Later, in 1890, Heawood showed that Kempe's proof of 4CC was flawed. Consequently, the mathematicians in 1890 would have *thought* that PROPcolor was necessarily false – i.e. they would have *thought* that the Idealizers had made PROPcolor necessarily false via idealized human factor X. They would have thought this because they would have believed that it is impossible for Kempe to use his actual 1879 proof of 4CC to prove 4CC (and they must have believed that this was in line with how the Idealizers divvied up the contingent and necessary truths and falsehoods). Now, the mathematicians in 1890 would not have *known* whether 4CC is necessarily true or necessarily false (there was no alternative proof or disproof); nevertheless, they knew Kempe didn't prove it with his actual 1879 proof.

Is IGDA compatible with the epistemic phenomenon of global modal error? It is because it provides us with a basis of comparison. The mathematicians in 1890 would

have thought that the mathematicians in 1879 were mistaken about the truth of PROPcolor, which in turn made them mistaken about PROPcolor's modal profile. The mathematicians in 1890 would have thought that the mathematicians in 1879 mistakenly thought that the Idealizers had drawn a distinction between the necessary and contingent truths and falsehoods that the Idealizers had not drawn. The mathematicians in 1879 mistakenly thought that the Idealizers had drew a distinction between the necessary truths and the contingent truths in which PROPcolor was among the contingent truths and falsehoods. Now, it certainly could be the case that the mathematicians in 1879 are correct and the mathematicians in 1890 are making a mistake to the extent that the mathematicians in 1879 thoughts on how the Idealizers determined which truths (and falsehoods) are necessary and which truths (and falsehoods) are contingent is correct. It is also possible that the both the mathematicians in 1879 and the mathematicians in 1890 were mistaken about the distinction the Idealizers made. Nevertheless, there is a basis of comparison; therefore, IGDA is compatible with global modal error. Consequently, any idealized dependent account of the source of necessity is compatible with global modal error.

REPLY: There are two related problems with this response. First, by appealing to idealized versions of ourselves – the Idealizers – as the source of the necessity that makes necessary truths necessarily true, IGDA faces the structural objection that I raised against the conventionalist theories of the source of necessity – the Incompleteness Objection. Now, according to IDGA, the Idealizers are responsible for dividing up truths (and falsehoods) into contingent truths (and falsehoods) and necessary truths (and falsehoods). Let's consider the modal status of the following proposition:

> **PROPideal**: The Idealizers are responsible for determining which truths (and falsehoods) are necessary and which truths and falsehoods are contingent.

Is PROPideal necessarily true or contingently true? To ease the dialectic, I am going to be talking about possible worlds in what follows. If the Idealizers made PROPideal contingently true, then there is a possible world, call it "w*", where it is false. If PROPideal is false at w*, then the Idealizers are not responsible for determining which truths (and falsehoods) are necessarily true and which truths (and falsehoods) are necessarily false at w*. If the idealizers are not responsible for determining which truths (and falsehoods) are necessary and which are contingent at w*, then there is a natural distinction between the possible worlds and the impossible worlds at w*. It won't do to say that we, the non-idealizers, are responsible for dividing up the worlds into the possible worlds and the impossible worlds at w* insofar as if that were the case, then there would be a problem with global modal error at w*. So, it must be the case that there is a natural distinction between the possible worlds and the impossible worlds at w*. Now, given an S5 model, every possible world can "see" every other possible world – so w* can see the actual world. If there is a natural distinction between the possible worlds and the impossible worlds at w*, then there is a natural distinction between the possible worlds and the impossible worlds at the actual world. If there is a natural distinction between the possible worlds and the impossible worlds at the actual world, then the Idealizers are not responsible for determining which truths (and falsehoods) are necessary and which are contingent. So, it must be the case that PROPideal is necessarily true. Are the Idealizers the source of the necessity of PROPideal being necessarily true? They are not the source of that necessity insofar as idealized human factor X plays no

role in determining that necessity. The source of the necessity of PROPideal being necessarily true must be the way the world – and if it were actually true, the world would be such that the Idealizers are responsible for determining which truths (and falsehoods) are necessary and which truths (and falsehoods) are contingent. So there is clearly a problem with IGDA – it is at best incomplete, but most likely inconsistent.

The second problem, which is related to the first, is that the notion of 'idealized versions of ourselves' is modal. The Idealizers are creatures that *can* know which mathematical system is the "correct" mathematical (if there is one), they *can* know absolutely everything that is entailed by the mathematical system they have adopted, they *can* do calculations that we could never do, and it *possible* for them to have a clear understanding of their intentions. The properties of the Idealizers are modal – things they can do that we cannot do. In other words, the Idealizers have modal natures. The problem with IGDA is that it is claiming the source of the necessity that makes necessary truths necessarily true are these beings with modal natures. Hence, IGDA is appealing to modal notions in its account of the source of necessity. Therefore, there are modal notions – the Idealizers – being used to describe the source of the necessity that makes necessary truths necessarily true. What, then, is the source of those modalities that are being appealed to? This is a question that IGDA is not equipped to answer – after all, it needs to appeal to those modalities to provide us with an account of the source of necessity. Ergo, IGDA is at best an incomplete account of the source of necessity.

4.6 Conclusion

What I hope has emerged in this chapter is that (i) all of the dependent accounts of the source of necessity that I have evaluated in the dissertation are incompatible with the

epistemic phenomenon of global modal error, and, more importantly, (ii) *any* Dependent Account of the source of necessity is incompatible with the epistemic phenomenon of global modal error. The arguments in this chapter demonstrate the incompatibility between the various existent Dependent Accounts of the source of necessity and global modal error are all slightly different from one another; nevertheless, a clear pattern has emerged. If human factor X determines the modal status of proposition *P* at time t_1 to be modality M_1 and at a later time, time t_2, human factor X determines the modal status of proposition *P* to be modality M_2, then we cannot say that we made a mistake at time t_1. We cannot say that we made a mistake at time t_1 insofar as if we did make a mistake at time t_1, then the actual modality of proposition *P* at time t_1 was modality M_2. If proposition *P*'s modality at time t_1 is M_2, then proposition *P*'s modality was not determined by human factor X at time t_1. If proposition *P*'s modality was not determined by human factor X at time t_1, then human factor X is not the source of proposition *P*'s modality at t_1 and the Dependent Account of the source of necessity is not cogent. Hence, the Dependent Account of the source of necessity is not compatible with global modal error.

It is important to note that Nondependent Accounts of the source of necessity are compatible with the phenomenon of global modal error. Recall, those theorists (Modal Realists, etc.) claim that the source of the necessity that makes necessary truths necessarily true is in no way dependent on us. There is, then, a clear distinction between the subjective aspect of modal theorizing, epistemic modality, and the objective aspect of modal theorizing, metaphysical modality, for those theorists. So, when we discover that some proposition has a different modal status than we *thought* it had, these theorists can

account for this error. The mathematicians in 1879 *thought* that PROPcolor was false at some possible world; however, it was *actually* false at every possible world in 1879. In 1890, the mathematicians *discovered*, thanks to Heawood, that PROPcolor was *actually* false at every possible world. In 1890, then, the mathematicians knew that they had been mistaken in *thinking* that PROPcolor was contingently true in 1879. Hence, the theorist with a nondependent answer to SNQ can account for the phenomenon of global modal error because she has a basis of comparison – metaphysical modality. In the next chapter I will critique nondependent accounts of the source of the necessity that make necessary truths necessarily true.

Chapter 5: A Critique of Nondependent Accounts of the Source of Necessity

5.0 Introduction

There are broadly speaking two different types of viable Reductive Accounts of the source of necessity: (i) Dependent Accounts that claim we humans are in one way or other the source of the necessity that makes the necessary truths necessarily true, and (ii) Nondependent Accounts in which the source of the necessity that makes the necessary truths necessarily true in no way grounded in contingent beings (most notably – humans).[79] In the last four chapters I have presented arguments that show Dependent Accounts of the source of the necessity are problematic. First, I have argued that existent Dependent Accounts of the source of necessity that employ conventions – Conventionalism, Neo-conventionalism, and Conventionalist Humeanism – are all incomplete accounts of the source of necessity. For each of those accounts, there are certain truths that must be necessarily true if that account is correct; however, the source of the necessity of those necessary truths cannot be accounted for using that account. Second, I argued in Chapter 4 that Dependent Accounts of the source of necessity are incompatible with the genuine epistemic phenomenon of global modal error. Dependent Accounts are incompatible with global modal error to the extent that they do not provide us with a basis of comparison, which is crucial for accounting for that type of error. Dependent Accounts do not provide us with a basis of comparison insofar as we

[79] Keeping in mind that a Reductive Account of the source of necessity is an account that does not utilize modal notions to explain the source of necessity and the problem with mixed reductive accounts discussed in the introduction.

determine the modal status of every proposition. If we determine the modal status of every proposition, how can we be mistaken about which truths are necessarily true when we determine which truths are necessarily true?

Stepping back from these arguments, there is something that is unintuitive about humans being the source of the necessity that makes the necessary truths necessarily true. One of the main problems with Conventionalism is the claim that certain truths, the analytic truths, are true by convention. For Conventionalists, the proposition that all bachelors are single males is true because the predicate concept 'single male' is contained in (or defines) the subject concept 'bachelor'. Yet, as explained in Chapter 1 and Chapter 2, the proposition that all bachelors are single males is not true because of some convention, but rather because all of the bachelors are in fact single males. Quine is correct in claiming, "considered in isolation from all doctrine, including logic, a definition is incapable of grounding the most trivial statement …" (Quine, 1976, p. 79). Now, if truth is not grounded in conventions, why think that a certain mode of truth – necessity – is grounded in conventions? It is certainly true that we *think* certain truths are necessary and we *think* other truths are contingent. But this only accounts for the epistemic modal status of those truths. There is, however, another mode of truth that we must consider.

For many propositions (if not all propositions), if that proposition is true, it is either contingently true or necessarily true *independent of whether we think* it is contingently true or necessarily true. For example, the proposition that black crows live in North America is true. Intuitively, the source of the truth of that proposition is

independent of us – its truth is grounded in the way the world is.[80] We *think* that that proposition is contingently true. Nevertheless, the truth of that proposition has a modal status that is independent of what we *think* its modal status is. The truth of that proposition is grounded in the way the world is – black crows do live in North America – and the modal status of that truth is also grounded in the way the world is. Suppose that Spinoza's account of Necessitism correctly describes the world we live in.[81] If that were the case, then the proposition that crows live in North America would be necessarily true despite the fact that we *think* it is contingently true. Now, of course most philosophers don't think Necessitism is correct, but showing that it is incorrect via an argument that doesn't rely solely on an appeal to a knee-jerk reaction (e.g. "my intuition tells me that it is incorrect") is a daunting task (one in which I will not pursue in this work).[82]

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[80] The grounding of truth is a contentious topic that I will not delve into in this dissertation (considering the various accounts of grounding and the arguments against ground would be a dissertation in itself). I am merely appealing to intuitions here and do not expect this to be a convincing argument against Dependent Accounts of the source of necessity. My arguments against those accounts can be found in the early chapters of this dissertation.

[81] Spinoza, in *The Ethics*, clearly states his version of necessitism in Proposition 29 and Proposition 33. Spinoza writes, "Proposition 29. Nothing in nature is contingent, but all things are from the necessity of the divine nature determined to exist and to act in a definite way" (Spinoza, 1992, p. 51). Spinoza then contends, "Proposition 33. Things could not have been produced by God in any other way or in any other order than is the case" (Spinoza, 1992, p. 54).

[82] If Necessitism is in fact incorrect, is the proposition that Necessitism is a correct account of the way the world is (call this proposition "N-PROP") contingently false or necessarily false? Those who champion Dependent Accounts of the source of necessity that rely on conventions would have a hard time answering this question using their own theories (it's another example of a truth whose modality cannot be accounted for using a dependent theory that relies on conventions). Let's consider Neo-conventionalism for an example. Suppose that N-PROP is only contingently false and S5 is the correct model for modeling modality. Then N-PROP would be true at some possible world w*. Since the correct model is S5, every possible world can "see" every other possible world (importantly, the actual world $w^{@}$ can "see" w* and w* can "see" $w^{@}$). If N-PROP is true a w*, then there is no other way things could have been. If there is no other way things could have been, then every world that w* can "see" is exactly like w*. Since w* can "see" $w^{@}$, $w^{@}$ is exactly like w*. Furthermore, every world that $w^{@}$ can "see" is exactly like w*. So (i) N-PROP is true at $w^{@}$ since $w^{@}$ is exactly like w*, which contradicts the claim that N-PROP is false in $w^{@}$, and (ii) N-PROP is necessarily true at $w^{@}$. For the Neo-conventionalist, then, it must be the case that N-PROP is necessarily false. What is the source of its necessity? It cannot be ground in some convention that we have adopted (in the case of Neo-conventionalism, latching on to some complementary subset pair of the set of worlds W based on our interests) to the extent that we have no choice in whether it is necessarily true or not – it must be necessarily true if Neo-conventionalism is correct. I will not rehearse the possible

Nevertheless, this example does show that that proposition has a modal status that is independent of us. The same holds true for necessary truths. Consider Goldbach's conjecture. Many philosophers think that the proposition that either every integer greater than 2 can be expressed as the sum of two prime numbers or not every integer greater than 2 can be expressed as the sum of two prime numbers expresses a necessary truth (due to the popularity of Classical Logic and its Law of Excluded Middle). However, for the Intuitionist Logician, that proposition does not express a necessary truth. It could express a necessary truth for the Intuitionist Logician if we had a proof (or disproof) of Goldbach's conjecture; however, we may never have a proof of Goldbach's conjecture and if that were the case, the proposition would not be necessarily true. The necessity of that proposition is not dependent on us; rather, it is dependent on which logic is the correct logic, if there is one that is correct.[83]

In this chapter I am going to critically evaluate the other type of reductive accounts of the source of necessity – nondependent accounts of the source of necessity. I will be considering two of the most prominent nondependent accounts of the source of necessity – David Lewis' Modal Realism and Kit Fine's Essentialism. I begin by briefly reviewing Lewis' Modal Realist account of the source of necessity and highlighting some notable problems with that account that are in the literature. I then consider Fine's

response (S5 is the wrong model) and reply to that response here, but it would be similar in kind to the discussion in Chapter 2.

[83] What if both Classical Logic and Intuitionistic Logic are correct (i.e. logical pluralism is correct)? In that case the proposition would be Classically necessarily true and Intuitionistically indeterminate (until we have a proof or disproof of Goldbach's conjecture if one can be found). Nevertheless, its modal statuses still do not depend on us but rather on the logics – in that way in can be Classically necessarily true and not Intuitionistically necessarily true if we never find a proof or disproof of Goldbach's conjecture.

Essentialist account of the source of necessity. I will raise some objections to the Essentialist account.

5.1 Lewis' Modal Realism

Let's begin by reviewing the Modal Realist answer to the question of the source of the necessity that was briefly discussed in Chapter 2. What is the source of the necessity that makes the necessary truths necessarily true? According to a Modal Realist, the necessary truths are necessarily true because they are true at every possible world. So, the source of the necessity that makes the necessary truths necessarily true are the possible worlds. Everyone who accepts possible world semantics will accept this answer to the source of necessity question. This, however, is not a reductive account of the source of necessity since we are appealing to the modal notion 'possible worlds' in our account of the source of necessity. To make this a reductive answer to the source of necessity question we must explain what these 'possible worlds' are without using modal notions. In this section I will discuss Lewis' account of worlds and some additional problems with his account that weren't discussed in Chapter 2.

5.1.1 Lewis' Concrete Worlds

Lewis, in *On the Plurality of Worlds*, begins his account of the metaphysics of modality with a familiar place – the actual world. He explains that our world, the actual world, includes many, many things as well as relationships between those things. There is no thing that is so far from us not to be a part of this world. There are, however, other ways that our world could have been. For instance, you could be watching a thrilling game of badminton instead of reading this dissertation. In addition, there are certain things that could never be different. It could never be the case that if you pick up one apple with

your left hand and pick up another apple with your right hand you are holding three apples in your hands. According to Lewis, the other ways the actual world could have been are worlds themselves that are just as real as our world. Lewis explains:

> There are countless other worlds, other very inclusive things. Our world consists of us and all our surroundings, however remote in time and space; just as it is one big thing having lesser things as parts, so likewise do other worlds have lesser otherworldly things as parts. … [The worlds] are isolated: there are no spatiotemporal relations at all between things that belong to different worlds. Nor does anything that happens at one world cause anything to happen at another. Nor do they overlap; they have no parts in common, with the exception, perhaps, of immanent universals exercising their characteristic privilege of repeated occurrence. (Lewis, 1986, p. 2).

For Lewis, objects in these other worlds exist in the same way as objects exist in our world. These worlds concretely exist just as our world concretely exists.[84] What sets our world apart from these other worlds is that it is the world out of all of the worlds that exist in which we reside. The designation of 'actual world' is not naming a property that our world has – concrete existence – that distinguishes it from the other worlds (our world is no different than any of the other worlds); rather, it is only an indexical expression that is context sensitive (Lewis, 1986, pp. 92-3).[85] These worlds are not worlds that we can travel to – they are connected neither spatiotemporally nor causally with our world (Lewis, 1986, pp. 80-1). Nevertheless, these worlds are just as real as our world. According to Lewis, "if I am right, other-worldly things exist *simpliciter* [i.e.

[84] Lewis is very dubious of the term 'concrete'. He writes, "… I am reluctant to that [possible worlds and individuals are concrete, not abstract] outright. Not because I hold the opposite view; but because it is not at all clear to me what philosophers mean when they speak of 'concrete' and 'abstract' in this connection" (Lewis, 1986, p. 81). After a lengthy discussion of those terms, he capitulates that "[under all of the ways of understanding the distinction between 'concrete' and 'abstract'] it seems that indeed I should say that worlds as I take them to be are concrete; and so are many of their parts, but perhaps not all. But it also seems that to say that is to say something very ambiguous indeed. It's just by luck that all its disambiguations make it true" (Lewis, 1986, p. 86) Since all of the disambiguations make it true, I will say that these worlds concretely exist.

[85] Note that Lewis is not an Actualist – someone who thinks that the only things that exist are the things in the actual world. Lewis clearly thinks there are possibillia - for him, the worlds that exist in logical space.

without qualifying 'exist' to only things that exist in our world], though often it is very sensible to ignore them and quantify restrictedly over our worldmates" (Lewis, 1986, p. 3). All of the worlds, including our world, exist in logical space. Lewis' positive argument for the existence of these worlds is an indispensability argument: he explains that the existence of the worlds is fruitful for our metaphysical theorizing on modality, closeness (in counterfactual theorizing about causation), content, and properties.

Since the other worlds are not spatiotemporally or causally connected to our world, Lewis proposes a reconceptualization of our notions of modality. For the Modal Realists, there is no sense in which individuals in our world – those exact individuals – could be any different than the way they actually are. According to Lewis, when we say that an individual in our world could have done something different than she actually did, what we are saying is one of that individual's counterparts in this world or another world did something different than the individual in our world.[86] Lewis gives us the following example:

[86] Lewis does claim that individuals can have counterparts in the very world in which they exist. This comes out in his analysis of Haecceitism. According to Lewis, "if two worlds differ in what they represent *de re* concerning some individual, but do not differ qualitatively in any way, I shall call that a *haecceitistic difference*. *Haecceitism*, as I propose to use the word, is the doctrine that there are at least some cases of haecceitistic difference between worlds. *Anti-haecceitism* is the doctrine that there are none" (Lewis, 1986, p. 221). Lewis is strictly speaking an Anti-haecceitist, but he does think that there are some scenarios where there appears to be a haecceitistic difference that needs to be accounted for – e.g. Lewis might have had a twin and in that world he could have been the first born or he could have been the second born (there would be no qualitative difference in the way that world is). According to Lewis, these twins in this world are his counterparts. Lewis explains, "they are two possibilities within a single world. The world in question contains twin counterparts of me, under a counterpart relation determined by intrinsic and extrinsic qualitative similarities (especially, match of origin). Each twin is a possible way for a person to be, and in fact is a possible way for me to be. I might have been one, or I might have been the other. There are two distinct possibilities for me. But they involve only one possibility for the world: it might have been the world inhabited by two such twins" (Lewis, 1986, p. 231). I find this odd. It seems like there are two possibilities for our world in this scenario: (i) Lewis in our world is qualitatively similar to the first born twin via 'match of origin', and (ii) Lewis in our world is qualitatively similar to the second born twin via 'match of origin'. Why think that there are two possibilities for our world? According to Lewis, worlds are composed of different relations between objects. Let's suppose that egg^{L} and sperm^{L} are the origin of Lewis for simplicity. For (i) to be the case, the relation between the objects has to be that egg^{L} and sperm^{L}

> As quantification over possible worlds is commonly restricted by accessibility relations, so quantification over possible individuals is commonly restricted by counterpart relations. In both cases, the restrictive relations usually involve similarity. … Oxford might be noted more for the manufacture of locomotives than of motor cars, or might have been a famous centre for the study of paraconsistent hermeneutics, iff some other-worldly counterpart of our Oxford, under some suitable counterpart relation, enjoys these distinctions. (Lewis, 1986, p. 8).

There are restrictions on how the counterparts are related to one another (some of which we will discuss later), but for our purposes now it is enough to note that our counterparts are numerically distinct from us and that there is some similarity relation between the counterparts. This similarity relation is a qualitative similarity relation.

The last thing that I will discuss in this brief synopsis of Lewis' Modal Realism is the principle of recombination and our epistemic access to these worlds. According to Lewis, the principle of recombination is "roughly speaking, the principle … that anything can coexist with anything else, at least provided they occupy distinct spatiotemporal positions. Likewise, anything can fail to coexist with anything else" (Lewis, 1986, p. 88). Now, there are no cross-world identities for Lewis, so there are no objects that are composed of parts that exist in different worlds. Lewis goes on to add the following proviso: "size and shape permitting" (Lewis, 1986, p. 89). The individuals that are part of a world must be able to co-exist in a world without violating the spatiotemporal structure of that world. Note, this principle is not a principle for creating worlds.[87] Rather, this principle of recombination allows us to model the various ways things could

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were ahead of/created before the egg and the sperm that created the twin. For (ii) to be the case, the relation between the objects has to be that egg^{L} and sperm^{L} were behind/created after the egg and the sperm that created the twin. And for all I know, the account of human could be way more complicated than this (e.g. involving relations between multiple objects). So it appears to me that we have worlds in this example. Nevertheless, Lewis does think that individuals can have counterparts in the same world.

[87] According to Lewis, "the worlds are not of our owning making. … We make languages and concepts and descriptions and imaginary representations that apply to worlds. We make stipulations that select some worlds rather than others for our attention. Some of us even make assertions to the effect that other worlds exist. But none of these things we make are the worlds themselves" (Lewis, 1986, p. 3).

have been – model the other concretely existing worlds. The principle of recombination will even guide us in our informal modal thinking. Lewis explains, "we get enough of a link between imagination and possibility, but not too much, if we regard imaginative experiments as a way of reasoning informally from the principle of recombination" (Lewis, 1986, p. 90). For example, imagining the possibility of a pig with wings is in line with the principle of recombination insofar as this being can exist in a world with a distinct spatiotemporal location, its properties are not cross-world properties, and that being fits within some possible (coherent) structure of spacetime. There are, however, some drawbacks with the principle of recombination that Lewis acknowledges. First, it is possible for there to be alien natural properties (properties that are not of this world) and alien individuals with those properties who live in alien worlds that cannot be accounted for by simply recombining the properties and or individuals of our world. Hence, there are some possible beings and possible states of affairs that cannot be accounted for using the principle of recombination (Lewis, 1986, p. 92). Nevertheless, Lewis claims, "although recombination will not generate alien worlds out of the parts of this world, it nevertheless applies to alien worlds [most notably that if there are some alien worlds, there are many alien worlds]" (Lewis, 1986, p. 92). Second, there is no world where there is nothing (no objects, no properties, etc.), which means that it is impossible for there to be nothing. Let me explain. In Lewis' theory, to say that it is possible that there is nothing, we must suppose there is something that contains nothing – a world. But to have a world there needs to be something (worlds are not empty – a world must contain something). So, if there is a world, then there is something not nothing. So it is impossible for there to be nothing. Lewis does not think that this is problem – he thinks

it could be used to show why there is something rather than nothing (Lewis, 1986, pp. 73-4).

5.1.2 Objections to Modal Realism

There have been a number of objections to Lewis' Modal Realism (some of which I discussed in Chapter 2). In fact, there are far too many objections and replies (mostly from Lewis) to exhaustively review here. However, I will discuss a couple of objections (and Lewis' replies to those objections when available) to important aspects of Lewis' account. I begin with Saul Kripke's objection to Lewis' Counterpart Theory. I then consider Peter Hanks' objection to using Lewis' Modal Realism as an account of the source of necessity.

The first objection that we will consider is an objection to Lewis' Counterpart Theory, which is essential for Modal Realism. To begin, it is worth reiterating what purpose possible worlds serve in our modal semantic theories. Possible worlds allow us to take propositions that contain intensional terms such as 'possible', 'contingent', 'could', 'necessary', 'must', etc. and evaluate those propositions via models (that contain possible worlds and the accessibility relation between those worlds) in a manner that roughly mimics an extensional logic. Let's consider a Quinean example.[88] The proposition that all creatures with hearts have kidneys is extensionally true since all the creatures in our world with hearts have kidneys. The proposition that necessarily all creatures with hearts have kidneys is false because there is some possible world where there are creatures that are in the extension of 'creatures with hearts' but not in the

[88] Quine, in *Philosophy of Logic: Second Edition*, uses 'cordate', 'creature with a heart', 'renate', 'creature with kidneys' to show the failure of substitutivity of 'cordate' with 'renate' in modal contexts.

extension of 'creatures with kidneys' at that world. Under Lewis' account of Modal Realism with his Counterpart Theory[89], the proposition that necessarily all creatures with hearts have kidneys is false because there are counterparts of creatures that exist in our world in other worlds (or, possibly the creatures in that world don't have counterparts in our world, which means they are alien creatures) that exist in some spatially temporally isolated world that have hearts but do not have kidneys. Hence, the proposition that all creatures with hearts have kidneys is false at that world, which makes the proposition that necessarily all creatures with hearts have kidneys is false at our world.

Kripke, in *Naming and Necessity*, raises concerns with Lewis' use of counterparts and qualitative similarity to identify counterparts in different worlds. He has us consider the aftermath of the 1968 presidential election and the sentence "Humphrey might have won the election (if only he had done such and such)." It is certainly plausible that Humphrey might have won the 1968 election if he had done things differently. For the Modal Realist this means there is a world where a counterpart of our Humphrey did those things and won the election. Kripke contends, "probably, however, Humphrey could not care less whether someone *else*, no matter how much resembling him, would have been victorious in another possible world" (Kripke, 1980, fn p. 45). Kripke is pointing out the unintuitive consequence of the Modal Realist's account of counterparts. For the Modal Realist, there is no sense in which our Humphrey – that very individual – could have won the election. To say that Humphrey could have won the election is really to say that Humphrey has a counterpart in some world and that counterpart won the 1968

[89] According to Lewis, "as possibility amounts to existential quantification over the worlds, with restricting modifiers inside the quantifiers, so necessity amounts to universal quantification" (Lewis, 1986, p. 7).

presidential election in that world. But, as Kripke contends, our Humphrey most likely doesn't care what happened to some numerically distinct individual that inhabits some other world. Humphrey cares about what would have happened to him – that very individual that exists in this world – if he had done things differently. This, however, is just part of the problem with counterpart theory that Kripke is pointing out in that part of *Naming and Necessity*. Before we address the other, more serious, problem, I will briefly discuss Lewis' response to this initial worry.

Lewis responds to this worry (Kripke's observation that Humphrey could care less about what happens to some other individual) by claiming that this problem applies to the ersatzer's theory just as much as to Modal Realism. Lewis explains,

> Counterpart theory does say (and ersatzism does not) that someone else – the victorious counterpart – enters into the story of how it is that another world represents Humphrey as winning, and thereby enters into the story of how it is that Humphrey might have won. Insofar as the intuitive complaint is that someone else gets into the act, the point is rightly taken. But I do not see why that is any objection, any more than it would be an objection against ersatzism that some abstract whatnot gets into the act. (Lewis, 1986, p. 196).

The fact that Humphrey has a surrogate – whether an "abstract whatnot" or concrete counterparts – that won the presidential election doing such and such in some (possible) world makes the sentence "Humphrey might have won the election (if only he had done such and such)" true. Without that "abstract whatnot" or counterpart, the sentence would have been false. Lewis goes on to say the fact that it is also true to say of Humphrey's surrogate – whether an "abstract whatnot" or concrete counterpart – that that surrogate could have won the election takes nothing away from the truth of saying our Humphrey could have one the 1968 presidential election. That "abstract whatnot" or counterpart of Humphrey's makes both claims true (Lewis, 1986, p. 196).

The other, more substantive, point that Kripke is making in *Naming and Necessity* is against the use of qualitative similarity or resemblance for the relation between the counterparts. Kripke, at the end of the passage quoted above, contends, "the important issues, however, are common to the two views [transworld identification and Counterpart Theory]: the supposition that other possible worlds are like other dimensions of a more inclusive universe, that they can be given only by purely qualitative descriptions, and that therefore either the identity or the counterpart relation must be established in terms of qualitative resemblance" (Kripke, 1980, fn p. 45). Kripke thinks that the Modal Realists and the theorists who champion transworld identification have reversed the order of analysis. For both the Modal Realists and tranworld identification theorists, we identify individuals via a qualitative similarity relation between individuals that exist in different worlds. In other words, we take worlds with individuals and home in on some property to identify the various counterparts in those worlds (Kripke, 1980, p. 53).[90] According to Kripke,

> So we do not begin with worlds (which are supposed somehow to be real, and whose qualities, but not whose objects, are perceptible to us), and then ask about criteria of transworld identification; on the contrary, we begin with the objects, which we have, and

[90] One of Kripke's main arguments in *Naming and Necessity* is that most names are not descriptions (the exception being those names associated with rigidified descriptions). Names, for Kripke, are rigid designators (e.g. the name 'Aristotle' picks out Aristotle in all possible worlds). Many descriptions are not rigid and will not pick out the same individual in all possible worlds (e.g. the description 'the teacher of Alexander the Great' will not pick out Aristotle in a world where he exists, but did not teach Alexander the Great). Now, according to Lewis, "given the inconstancy of counterpart relations, we may have to say that a name is quasi-rigid under some counterpart relations but not others" (Lewis, 1986, p. 256). Lewis thinks the inconsistency in counterparts can explain the inconsistency in our modal predictions (e.g. How we might answer the following question: Could water been composed of XYZ or must it be the case that water is compose H_2O? According to Lewis, we sometimes think the former and other time think the latter). Yet, if the name is not rigid, then how are we determining there is a counterpart relation between the two otherworldly objects under consideration? Furthermore, the inconsistency seems better explained by Kripke's distinction between epistemic modality and metaphysical modality. We might sometimes *think* that it is possible for water to be composed of XYZ and other times *think* it is impossible for water to be composed of XYZ, but it is always *metaphysically* impossible for water to composed of XYZ.

> can identify, in the actual world. We can then ask whether certain things might have been true of the objects" (Kripke, 1980, p. 53).

We start out with the very individuals in our world, e.g. Humphrey, and then ask what would have happened to some such individual if things were different. To do this analysis, we do not need to discover what is the case at some inaccessible world. As Kripke famously said, "'possible worlds' are stipulated, not discovered by powerful telescopes" (Kripke, 1980, p. 44). The gist of the problem, as I understand it, is that Kripke introduced possible worlds as a useful tool for modeling quantified modal logic and the use of possible worlds has led to "… philosophical pseudo-problems and misleading pictures" (Kripke, 1980, p. 48). Lewis' counter to this assertion is that positing the existence of possible worlds is fruitful for our metaphysical theorizing and we should accept their existence if the cost is not too high (Lewis, 1986, pp. 3-4).

Peter Hanks, in "A Dilemma About Necessity," raises another concern with using Lewis' concrete worlds as an explanation about the source of the necessity that makes necessary truths necessarily true. Hanks begins by drawing a distinction between two different projects: (i) providing a linguistic analysis of the term 'necessity', and (ii) providing an explanation of the source of necessity. The task of providing a linguistic analysis of 'necessary' is focused on explaining the meaning of that term when it is used in sentences like "Necessarily 3 is a prime number". The task of explaining the source of the necessity that makes necessary truths necessarily true is metaphysical – finding a non-modal ground for necessity. In other words, the project of explaining the source of necessity has nothing to do with the meaning of the term 'necessary'. Now, according to Hanks, "Lewis is less explicit about the fact that he is analyzing the meaning of the modal expressions, but there are good reasons for reading him this way" (Hanks, 2008, p.

144). The evidence that Hanks uses comes from Lewis' thoughts on how we are to analyze claims that contain modal terms. For instance, Lewis thinks that we should treat 'necessary' as a type of universal quantifier that quantifies over all concretely exiting worlds that is restricted by relation constraints on the frame (Lewis, 1986, p. 19 - 20). Hence, Lewis' project is the project of determining the meaning of 'necessary' and not the project of finding the source of necessity. Can we somehow use the semantic project to solve the metaphysical problem? Hanks argues that we cannot. Hanks explains:

> The problem of the source of necessity is the problem of finding a metaphysical reduction of necessity. As we have seen, this problem cannot be solved by giving a semantic reduction of the word "necessary". Suppose we hold, following Lewis, that "necessary" means "true in all possible worlds". In that case the problem of the source of necessity becomes the problem of explaining what makes certain truths true in all possible worlds. It is no help to have it repeated that they are true in all possible worlds. (Hanks, 2008, p. 145).

In other words, if we use Lewis' framework for explaining the meaning of our modal terms, like 'necessary', to try to explain the source of necessity, then we end up with essentially the same question in different clothing. We wanted to know what is the source of the necessity that makes necessary truths necessarily true. If we use Lewis' concretely existing possible worlds, the answer is that the source of those truths' necessity are the concretely existing worlds. But why are those truths (e.g. 2 + 2 = 4) and not other truths (e.g. the truth that black crows live in North America) true at all of the possible worlds? What is the source of that phenomenon? This is a question that Lewis' account is unable to address. The Modal Realist cannot say that those truths that are true at every concretely existing world are true at those worlds because they are necessary, since to do so would be circular. The Modal Realist could say that it is a brute fact that those truths are true at every concretely existing world, but this is not much of an improvement on saying that it is a brute fact that some truths are necessary, and others are not. In fact, if ontological parsimony is a theoretical virtue, then saying that it is a brute fact that certain truths are true at all of the concretely existing worlds is less virtuous than saying it is a brute fact that certain truths are necessary (no need to posit an

immense logical universe chock-full of concretely existing worlds if this route is taken). Hence, if Lewis' theory is taken as an account of the semantics of 'necessary', then we do not get an account of the source of necessity. If Lewis' theory is used as an account for the source of necessity, then it does not solve the puzzlement over the source of necessity.

5.2 Fine's Essentialism

Kit Fine's account of Essentialism, discussed in length in his article "Essence and Modality: The Second Philosophical Perspectives Lecture," is not motivated by the question of the source of the necessity that makes necessary truths necessarily true *per se*. His main motivation for that article, as well as his other work on essence, is primarily concerned with providing a foundation for essential properties. Fine's work does, however, have direct implications for the source of the necessity question, which he clearly explains. I begin by presenting Fine's argument against the traditional modal grounding of essence and his alternative account – Essentialism. I then explain how, according to Fine, essential properties are the source of the necessity of the mathematical, logical, and metaphysical necessary truths. Next, I explain why Fine's Essentialism, or any other Essentialist account, cannot be an account of the source of the necessity of *all* necessary truths. Finally, I consider other objections to Essentialism and raise additional problems with using that account as an account of the source of necessity.

5.2.1 Fine on Essence and the Source of Necessity

According to Fine, essences play a crucial role in our metaphysical theorizing. We use essences to characterize the subjects under consideration and to pick out the properties that we are discussing – Fine calls this the "external role" of essences (Fine, 1994, p. 1). In addition, Fine explains, "it [the concept of essences] plays not only an external role, in

helping to characterize the subject, but also an internal role, in helping constitute it" (Fine, 1994, p.1). For example, suppose that we are trying to discover the correct criterion for personal identity. In order to do this, we must first determine what property an entity must have to be a person. The kind of property that we are interested in is the property that makes that thing that thing (e.g. the property that make a person a person). After we have determined what property makes a person a person, we then theorize about the conditions that must be met for a person at time t_2 to be numerically identical to a person at time t_1 (which will include that essential property).

There are two different ways to characterize essences. Many, if not most, contemporary metaphysicians characterize essence in terms of modality (call these accounts "modal accounts"), which is the first characterization that we will discuss. Fine explains, "at its very simplest, it takes an object to have a property essentially just in case it is necessary that the object has the property" (Fine, 1994, p. 3). This characterization can be understood as a reductive account of essence – essences are grounded in a fundamental modal framework. There are two variants of the modal account (Fine, 1994, p. 4). Both variants of the modal account of essence draw a distinction between accidental and essential properties. The first variant of the modal account is based on identity.

> **Accidental Property (defined on identity)**: A property *p* of an object *o* is an accidental property iff *o* has *p* but could lose *p* and still be *o*.
>
> **Essential Property (defined on identity)**: A property *p* of an object *o* is an essential property iff *o* has *p* and cannot lose *p* and remain *o*.

The other variant of the modal account is based on existence.

Accidental Property (defined on existence): A property *p* of an object *o* is an accidental property iff *o* could lose *p* and still exist.

Essential Property (defined on existence): A property *p* of an object *o* is an essential property iff *o* must have *p* to exist.

Both of these variants of the modal characterization clearly ground essence in a modal framework.[91] For example, let's consider a molecule of water and two of its properties. The molecule of water has a location. Is this an accidental or essential property of the molecule of water? If the molecule of water were to be transported to another location, it would still be that molecule of water (alternatively, the molecule of water would still exist). Intuitively, this seems to be correct. So, the property of location is an accidental property of the molecule of water. The molecule of water also has a certain chemical composition (i.e. it is composed of two hydrogen atoms and one oxygen atom). Is that property accidental of essential to the molecule of water? If the molecule of water were to lose one of its hydrogen atoms (i.e. it is no longer composed of two hydrogen molecules and one oxygen atom), then resulting object would not be that molecule of water to the extent that it is no longer a water molecule (alternatively, the molecule of water would no longer exist). For those who champion essential properties, this counterfactual is correct. So, the property of having that chemical composition is essential to that molecule of water.

[91] For Lewis, we might have the following criterion: property *p* is an essential proper of object *o* iff every counterpart of *o* has *p*. However, when discussing the inconsistence of *de re* modality, Lewis claims, "the exact meaning of 'counterpart' or 'similar' is neither constant nor determinate. …Two things may be counterparts in one context, but not in another; or it may be indeterminate whether two things are counterparts" (Lewis, 1986, p. 254). Now, that might make any notion of essential property problematic for Lewis.

Fine's objection to modal accounts centers on arguing that the criteria given above are too coarse grained to ground essence. In other words, a modal framework is not fine grained enough to pick out essences of objects. Fine explains, "my objection to the modal accounts will be to the sufficiency of the proposed criterion, not to its necessity. I accept that if an object essentially has a certain property then if is necessary that it has the property (or has the property if it exists); but I reject the converse" (Fine, 1994, p. 4). Fine's method is to provide a number of counterexamples:

1. **Socrates and Singleton Socrates:** To begin, Fine has us consider Socrates and his singleton. It is necessary that Socrates is a member of his singleton if Socrates exists. Likewise, it is necessary that Socrates exist if his singleton exists, since he is the only member of that singleton. Hence, (i) Socrates is essential to his singleton, and (ii) Socrates' singleton is essential to Socrates. Fine claims that (ii) is incorrect. Fine contends, "it is no part of the essence of Socrates to belong to the singleton" (Fine, 1994, pp. 4-5).
2. **Socrates and the Eiffel Tower:** Socrates and the Eiffel Tower are two distinct objects. So, it is necessarily the case that they are not the same objects. If that is the case, then according to the modal accounts, it is part of the essence of Socrates that he is distinct from the Eiffel Tower. Fine notes that this too doesn't seem to be correct – a distinct object should not be part of the essence of Socrates (Fine, 1994, p. 5).
3. **Socrates and Mathematical Truths:** All of the mathematical truths are necessarily true. Ergo, any world in which Socrates exists the mathematical truths are true. Under the modal account, then, the mathematical truths are part of Socrates' essence. Fine contends, "but it is no part of Socrates' essence that there be infinitely many prime numbers or that the abstract world of numbers, sets, or what have you, be just as it is" (Fine, 1994, p. 5).
4. **Socrates and Existence:** It is clear that any world in which Socrates exists is a world in which he exists. If that is the case, then it is an essential property of

> Socrates that he exists. But this is to say that Socrates essential exists, which Fine claims is incorrect (Fine, 1994, p. 6).

Fine's diagnosis of the problem with modal accounts is that metaphysical necessity is not fine grained enough to take into account the various sources of necessity.[92] This is clearly evident in 3 above. The necessary mathematical truths have nothing to do with Socrates essence, yet since they must be true in all worlds in which Socrates exists, they become part of the essence of Socrates under the modal accounts. According to Fine, "each object, or selection of objects, makes its own contribution to the totality of necessary truths, and one can hardly expect to determine from the totality itself what the different contributions were" (Fine, 1994, p. 9). Therefore, modality is not a good ground for essence.

Since both versions of the modal characterization of essence are faulty, the correct characterization of essence, according to Fine, is based on the model of definition (the only other characterization).[93] This alternative characterization of essence is based on a rather old theory of definitions – let's call it "The Theory of Real Definitions." It is often thought by modern philosophers that definitions are exclusively linguistic items – definitions are the things that we use to define the terms in a language. For example, the

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[92] Fabrice Correia, in "(Finean) Essence and (Priorean) Modality," devises a non-standard modal logic that is sufficiently fine grained to be the basis of essences. The non-standard modal logic involves having two possibility operators (one for global possibility and one for local possibility) and two necessity operators (one for global necessity and one for local necessity) (Correia, 2007, pp. 63 – 84). Fine, in "Response to Fabrice Correia," claims, "… it was not my intention to argue against an account of essence in terms of any modal notions whatever" (Fine, 2007, p. 85). I find this odd since the whole motivation for using real definitions in "Essence and Modality" was that the modal accounts don't work.

[93] Fine considers whether there might be alternative modal formulations: "But might there not be some other, perhaps quite different, version of the modal criterion which is not subject to these difficulties? Although it is hard to be definitive on such a matter, I think it can plausibly be made out that no such alternative account is to [be] found. For it seems to be possible to agree on all of the modal facts and yet disagree on the essentialist facts. But if any modal criterion of essence were correct, such a situation would be impossible" (Fine, 1994, p. 8).

term ‘bachelor’ (the definiendum) is defined (at least partially) as ‘single male’ (the definiens). Those philosophers who believe that definitions are exclusively linguistic items would think that you are guilty of a category mistake if you take an object as the definiendum of a definition. Suppose that you have a molecule of water – call it “A”. If you were to say that the true proposition that A is H_2O defines what A is, you are taking ‘A’, which refers to an object, as your definiendum and you would be accused of making a category mistake. But this hasn’t always been the case. For instance, consider Aristotle’s account of essence and definition. For Aristotle, the essence of an object is a property that makes that object what it is. Furthermore, according to Aristotle, “… each primary and self-subsistent thing is one and the same as its essence” (Aristotle, 1941, 1032a5). Now, if the thing and its essence are one and the same thing, then the object can be defined in terms of its essence. This is not, however, a linguistic definition (defining words by specifying its meaning); rather, we are defining objects by specifying their essences. Aristotle explains:

> … [T]here is an essence only of those things whose formula is a definition. But we have a definition not where we have a word and a formula identical in meaning … but where there is a formula of something primary; and primary things are those which do not imply the predication of one element in them of another element. Nothing, then, which is not a species of a genus will have an essence – only species will have it, for these are thought to imply not merely that the subject participates in the attribute and had has is an affection, or has it by accident…. (Aristotle, 1941, 1030a6)

For Aristotle, the essence of an object defines what it is to be that object. In other words, essences are real definitions of objects.

Fine’s account of real definition differs from Aristotle’s account. Aristotle focuses on the essence of a species defined in terms of its genus and differentia (e.g. man is a rational being) and is not completely worked out (at least we don’t have all of it).

Fine, in "Ontological Dependence," explains, "just as we can think of a collection of sentences as providing a nominal definition of a term, so we can think of a collection of propositions as providing a real definition of an object; and just as we can distinguish, in a nominal definition, between the term defined and the terms by which it is defined, so we can distinguish, in a real definition, between the object defined and the objects by which it is defined" (Fine, 1995, p. 275). Fine contends that the essence of an object is the collection of true propositions that correspond with the essential properties of that object (Fine, 1995, p. 275). For example, consider the proposition that Saul Kripke is the product of the fertilization of a specific egg from Dorothy Kripke by a specific sperm from Myer Kripke. Let's suppose for the sake of simplicity that the only essential property of humans is their origin. If that were the case, then Fine would count that proposition as a real definition of Saul Kripke. First, the proposition is true in virtue of Saul Kripke's identity – to be Saul Kripke is to be the product of the fertilization of that particular egg by that particular sperm. It is also clear which object is the definiendum – Saul Kripke – and which objects are part of the definiens – a particular egg from Dorothy Kripke and a particular sperm from Myer Kripke. Now, it might be the case that those objects in the definiens have essential properties of their own, in which case there would be true propositions of those objects that correspond to their essential properties.

Fine does acknowledge that there are two assumptions that he is making in his Essentialist account. The first assumption that Fine is making is that both propositions and properties contain objects as their constituents. Fine is taking this assumption as given and does not put forth any claims about the actual composition of propositions and properties. The second assumption that Fine is making is that the type of essence that

matters for Essentialism is constitutive essence (as opposed to consequential essence). Fine's initial distinction between constitutive essence and consequential essence is fairly straightforward. A constitutive essence is composed of a property (and/or a proposition that expresses that object has that property) that is not dependent on, nor a logical consequence of, other essential properties (Fine, 1995, p. 276). For example, the property of being composed of two hydrogen atoms and one oxygen atom is the constitutive essence of a molecule of water. A consequential essence is dependent on, or a logical consequence of, other constitutive essential properties (and/or a proposition that is the logical consequence of a set of propositions about constitutive properties) (Fine, 1995, p. 276). Consider once again the molecule of water. The property of having some chemical composition is part of the consequential essence of that molecule of water to the extent that having that essential property is a logical consequence of the constitutive essence of that molecule of water (having two hydrogen atoms and one oxygen atom). Furthermore, the conjunction of (i) the constitutive essence of water being composed of two hydrogen atoms and one oxygen atom, and (ii) the property the molecule of water being self-identical, is also part of the consequential essence of that molecule of water. It is clear that the consequential essence will not give us the real definition of the molecule of water insofar as it will contain essential properties that hold of all objects generally (as well as other general properties that hold of everything). The metaphysician, then, is primarily concerned with the constitutive essences of objects – the type of essence that will constitute the real definition of those objects.

There is a problem, however, with the distinction between constitutive essence and consequential essence as given. Fine explains that the problem we are facing is that

of distinguishing between the constitutive essences and consequential essences. Fine questions, "for how and where are we to draw the line between what is basic to the essence and what is derived" (Fine, 1995, p. 277)? In other words, how do we distinguish between the constitutive essence and consequentialist essence of any object? This seems to be only an epistemological problem to the extent that Fine is concern with our knowledge of the different essences (as opposed to a problem with the way the world is). However, as Jonathan Livingstone-Banks, in "In Defense of Modal Essentialism," explains, "in order to maintain an intelligible characterization of the constitutive conception of essence, we need a metaphysical definition of what a 'more basic' part of an object's essence is" (Livingstone-Banks, 2017, p. 823). Fine's straightforward solution to this potential problem is to introduce a new way of distinguishing between those propositions that are part of the constitutive essence of an object and those propositions that are part of consequentialist essence of that object (that depend on other objects) – logical closure via generalization. Fine explains, "… when an object enters thorough logical closure, it can be 'generalized away'" (Fine, 1995, p. 277). We can loosely think of 'generalized away' as 'follows from a more general proposition'.[94] An example will clarify Fine's solution. For simplicity's sake, suppose that the general essence of a molecule of water can be expressed by the following two propositions: (i) the proposition that the molecule of water is composed of two hydrogen atoms and one oxygen atom, and (ii) the proposition that the molecule of water is self-identical. Since

[94] More specifically, according to Fine, "without serious loss in generality, we may take the constitutive essence of the object x to be given by a single proposition P; and we may take its consequential essence to be given by a collections of propositions C. Suppose that y is not a constituent of P. Since any proposition Q(y) of C is a logical consequence of P, so is ∀vQ(v) and hence y can be generalized out" (Fine, 1995, p. 278).

every object is self-identical, the proposition that the molecule of water is self-identical can be generalized away, which makes it part of the consequential essence of the molecule of water. The proposition that the molecule of water is composed of two hydrogen atoms and one oxygen atom cannot be generalized away. The proposition that all objects are composed of two hydrogen atoms and one oxygen atom is false. So, the proposition that the molecule of water is composed of two hydrogen atoms and one oxygen atom is part of the constitutive essence of the molecule of water.[95]

Fine contends that his Essentialism can be used to explain the source of the necessity of the metaphysical necessary truths (as opposed to the necessary truths being the source of essences). According to Fine, "For each class of objects, be they concepts or individuals or entities of some other kind, will give rise to its own domain of necessary truths, the truths which flow from the nature of the objects in question. The metaphysically necessary truths can then be identified with the proposition which are true in virtue of the nature of all objects whatever" (Fine, 1994, p. 9). For example, the source of the necessity of the metaphysical necessary truth expressed in the proposition that water is H_2O is based in the constitutive essence of water. In other words, that proposition is necessarily true because water has the constitutive essence that it does – namely, essentially being composed of two hydrogen atoms and one oxygen atom. Moreover, Fine claims, "… the necessities of a given discipline, such as mathematics or

[95] Gideon Rosen, in "Real Definition," raises a number of problems with Fine's reliance on constitutive essence. One of the problems, according to Rosen, is that Fine's use of constitutive essences block definitional expansion. Rosen has us consider the following two definitions of 'square': (i) the proposition that to be a square is to be an equilateral rectangle, and (ii) the proposition that to be a square is to be a right quadrilateral. According to Rosen, we get a third definition from (i) and (ii): (iii) the proposition that to be a square is to be an equilateral right quadrilateral (Rosen, 2015, p. 197). Rosen claims, "but it is highly unlikely that the constitutive essence of *square* contains both [(i) and (ii)], since that would render the constitutive essence implausibly redundant" (Rosen, 2015, p. 197).

physics, can be taken to be those propositions which are true in virtue of the characteristic concepts and objects of the discipline" (Fine, 1994, p. 10). Consider the necessary truth that 2 + 3 = 5. The source of the necessity of this necessary truth can be found in the characteristic concepts (or, for the Platonist, objects) '2', '3', '5', '+', and '='. So, the source of the necessity of the mathematical, logical, and metaphysical truths is to be found in the essential properties (i.e. the real definitions) of the concepts and objects of mathematic, logic, and metaphysics. Importantly, Fine claims, in "Essence and Modality", that not all concepts of necessity can be understood in a similar manner. He does not say why this is the case in that article. I will discuss why Fine makes this qualification in the next section.

5.2.2 Infinite Regress and Incompleteness Objections to Essentialism

In this section I will raise two objections to Fine's Essentialist account of the source of necessity. In the first argument I consider a proposition about the nature of properties. I will show that the foundation of the Essentialist account of the source of necessity is in fact based in an infinite hierarchy of higher-order essential properties. I will argue that while this chain of infinite higher order properties is not vicious, it nevertheless is unintuitive. The second, and more important, argument that I will present shows that any viable Essentialist account of the source of necessity is an incomplete account when, as is usually the case, it is paired with Actualism.

The first problem with Fine's Essentialist account of the source of necessity is based on considering the source of the necessity of the necessarily true proposition that the essential properties characterize objects and other properties in ways that remain constant. For example, the property of *being a prime number* characterizes a number that

is only evenly divisible by 1 and itself. The property of *being a prime number* remains constant for all Natural Numbers. It does not change for the really large numbers. If a large number N is only evenly divisible by 1 and itself, then N is a prime number. If a large number M is evenly divisible by 1, itself, and other numbers less than M, then M is not a prime number. Let's call the proposition that the essential properties characterize objects and other properties in ways that remain constant "PROP-character".

> **PROP-character**: The essential properties characterize objects and other properties in ways that remain constant.

PROP-character must be necessarily true, if Essentialism is correct. It is crucial for both constitutive essences and consequential essences that the essential properties characterize objects and other properties in ways that remain constant.

Let's consider a few examples to see why PROP-character must be true for the Essentialists.[96] First consider the property *is human*. Suppose that it is possible for the way that the property *is human* characterizes objects to vary by world. If the way that *is human* characterizes objects were to vary in such a way that in some possible world w* it included the feature of, say, having gills, then Fine (or anyone else) would not have the property *is human* in w* insofar as they do not exemplify that property in w*. The property of *is human* could not, then, be part of the constitutive essence of Fine (or anyone else) to the extent that it would not be an essential property (if it were an essential property, then the way it characterizes objects would not vary from world to world). Yet, for the Essentialist *is human* is an essential property and is part of the constitutive essence

[96] I am going to frame these examples using modal notions. The sole purpose of these examples is to show that it is impossible for properties to characterize objects and properties in a way that is not constant and I don't think that any Essentialist will disagree. These examples are unintuitive, but I think the unintuitiveness of these examples is a good indicator that PROP-character must be necessarily true.

of humans. Now consider the property *is identical to itself*. Suppose that it is possible for the way that the property *is identical to itself* characterizes objects and properties were to vary in such a way that in some possible world w* it was exemplified in w* only by numbers and not by objects, which also exist in the world. If that were case, then *is identical to itself* would not be a consequential property to the extent that it only applies to numbers (i.e. it doesn't apply generally). Yet, for the Essentialist *is identical to itself* is an essential property of all objects and properties, which makes it part of the consequential essence of every object and property. From both of these examples it is evident that PROP-character must be necessarily true for the Essentialist. Now, you might find these examples to be unintelligible – what does it mean for a property to characterize objects or properties differently from world to world? But if that it is the case, that should be further evidence that, intuitively, PROP-character must be necessarily true.

We have established, then, that PROP-character is necessarily true. What is the source of PROP-character's necessity? For the Essentialists, the source of the necessity of all metaphysical necessary truths (about objects and properties) are the essential properties of the objects and concepts of metaphysics. So, there are two possibilities for the source of PROP-character's necessity. First, it could be the source of its own necessity. That is clearly problematic since it circular (and a tight circle at that) and, for the Essentialist, all other necessities are dependent on it being true. Second, the source of its necessity could be a third-order property of that second-order property (PROP-character is a proposition about a property of properties). But of course, this third-order property is a property itself, so the proposition the essential third-order properties

characterize other properties in ways that remain constant must be necessarily true (if not, we have the same problem at a higher level). But that proposition is about a necessary fourth-order property, so the proposition that the essential third-order properties characterize objects and other properties in ways that remain constant must also be necessary true. And so on *ad infinitum*. Now, this regress need not be vicious – we are, after all, talking about the metaphysical structure of the world and the lattice of hierarchical essential properties could just exist. There is, however, something unintuitive that follows from this lattice of hierarchical essential properties – unintuitive in the same sense that Lewis' concretely existing possible worlds are unintuitive, which we discussed earlier. In order for me to have the essential property of being human, this lattice of hierarchical essential properties must be in place. But why does my own constitutive essential property of being human depend on that structure? It seems that my being human should only be dependent on me being the object that I am. Further, my consequential essential property of being identical to myself also depends on the lattice of hierarchical essential properties. Yet, my property of being identical to myself seems to only depend on the ontology of objects and properties and not some lattice of hierarchical essential properties. None of this proves that Essentialism is incorrect. Nevertheless, the commitment to all of these higher order essential properties to ground the more familiar essential properties might draw an incredulous stare.

The second, and more important, objection to Essentialism is that it's an incomplete account. To develop this objection, we will first need to examine Fine's ontology. According to Fine, the only objects that exist are the actual objects – there are no abstract (or concrete) possible worlds and no abstract possible beings (or extra-

worldly counterparts).[97] Fine is an Actualist in the strictest sense. This seems appropriate given his Essentialist account of the source of metaphysical, logical, and mathematical necessity, where the essences of the concepts and objects are the sources of the necessity of the necessary mathematical, logical, and metaphysical truths. The problem with Actualism is accounting for possibilia (i.e. possible objects) and our discourse about possibilia. Fine, in "The Problem of Possibilia," claims that there are four accounts of possibilia and our discourse about possibilia: (1) Extreme Actualism: possibilia do not exist and our discourse about possibilia is unintelligible, (2) Non-Factual Actualism: possibilia do not exist and our discourse about them is intelligible, but non-factual, (3) Fine's Actualism: possibilia do not exist, yet our discourse about them is factual, but reducible to discourse about actual objects, and (4) Possibilism: possibilia exist and our discourse about them is non-reducible (Fine, 2005b, p. 214). Fine claims, "… (4), especially in its more extreme forms, offends against what Russell has called our 'robust sense of reality', (1) offends against our even more robust sense of what is intelligible, while (2) offends against our somewhat less robust sense of what is factual" (Fine, 2005c, p. 215).[98] To understand Fine's account of modal discourse about possibilia, we must consider how our discourse about them is factual by way of being

[97] Fine, in the introduction to *Modality and Tense: Philosophical Papers*, contends, "it is important to appreciate that the proposed analysis is not a form of proxy reduction (what Lewis [1986], ch. 3 calls 'ersatzism'). There are no objects that do duty for the possible objects. … In talking of possible objects – of possible people, say, or possible facts – one is talking of actual objects – of actual people or actual facts – but under the rubric of what is possible" (Fine, 2005a, p. 13).

[98] This is not Fine's argument against those positions. According to Fine, "I shall not be concerned to argue directly against any of the other options. However, any argument for the viability of (3) is indirectly an argument against their plausibility" (Fine, 2005b, p. 215). The rest of "The Problem of Possibilia" is concerned with making (3) plausible. I will not recount his argument here because it is not essential for our discussion of the source of necessity. We'll just assume that Fine is successful in showing (3) to be plausible.

reducible to talk of actual objects. Key to understanding Fine's Actualism is recognizing that he is using 'actual' here in a very specific way – as an operator that relativizes the objects in the domain of discourse to individual worlds.

Before going on to discuss Fine's treatment of possible object discourse, it is worth recalling that according to Fine, there are no possible objects or possible worlds (Fine, 2005a, p.13). To account for discourses about possible objects, Fine argues that we must reduce those discourses to discourses about actual objects instead of possible objects. Fine, in "Plantinga on the Reduction of Possibilist Discourse," provides us with the following translation of 'some possible individual As':

> There is an (actual) world such that possibly there is an (actual) individual for which necessarily if the world exists (is actual) then the individual As:
> $(\exists w \Diamond \exists x \Box(\mathrm{E}w \supset \mathrm{A}(x)))$ (Fine, 2005b, p. 211).

Note that '(actual)' here is a taken to be an Actualist quantifier that ranges exclusively over the objects in the domain of that world (it does not range over all possible object like in a constant domain model). For example, consider the proposition that Saul Kripke's biological son is an astronaut. Since Saul Kripke's biological son doesn't exist in the actual world, for this proposition to be true it must be the case that there is a world w* (considered as actual) such that possibly there is an individual (Saul Kripke's biological son is in the domain of w*) for which necessarily if w* exists (is considered actual), then Saul Kripke's biological son is an astronaut. Notice that (i) we are appealing to a world, w*, in this rendering of the proposition and using its domain that contains Saul Kripke's biological son, and (ii) we are using the modal notions of 'possible' and 'necessary'. Fine goes on to explain, "a similar account can be given of possible worlds, but with reference to individuals replaced throughout by references to worlds" (Fine, 2005b, p.

211).[99] There are two things to note about Fine's account of possibilist discourse. First, Fine is using worlds in his account. According to Fine, this is perfectly acceptable for an Acutalist to the extent that:

> … his objection is not to worlds as such, but to possible worlds; just as his objection is not to persons as such, but to possible persons. It is in his capacity as world-reducer, not actualist, that he will eliminate reference to the actual world; just as it is in his capacity as person-reducer that he might eliminate the reference to actual persons. (Fine, 2005b, p. 212)

This passage highlights Fine's position that our discourses about possible objects and possible worlds are completely dependent on how we use our language. Second, in both the possible individual rendering and the possible worlds rendering of our possibilist discourses, Fine is appealing to modal notions 'possible' and 'necessary' to explain possible beings and possible worlds, which is not surprising since modal discourse is just another way of talking about actuals (Fine, 2005b, p. 213). This makes a fully reductive account of the source of necessity using Fine's Essentialism and Actualism impossible.

Can we avoid this problem by using one of the other four accounts of possibilia and our discourse about possibilia mentioned above? Option (4), Possibilism, is ruled out for any Actualist since according to that account, possibilia exist and our discourse about possibilia is not reducible to discourse about actual objects. Moreover, with Possibilism we don't have to appeal to modal notions to explain possibilia – for instance, Lewis' Realist account of possible worlds doesn't require appealing to modal notions to talk

[99] Fine, in "The Problem of Possibilia," address a shortcoming of this account. The shortcoming is quantifying over sets of possible individuals. Fine solution is to rely on second-order quantification over sets of possible individuals. Fine explains, "… since our non-proxy reduction of possibilist discourse extends straightforwardly to infinitary quantifier 'there are possible objects x_1, x_2, … ,' we are thereby able to account for higher-order quantification over sets of possible individuals, sets of such sets, and so on throughout the cumulative hierarchy" (Fine, 2005c, p. 227). Note that Fine is still relying on modal notions in this solution.

about possible objects or possible worlds. Such accounts, however, come with a heavy ontological price. Any fully reductive account of the source of necessity that involves possibilia is going to have as many objects as Lewis has in his Modal Realism, which, as Fine correctly states, offends our notions of what objects exist. Another problem that faces all robust realist accounts is how we have epistemic access to the concrete worlds that exist – how do we know that there is no concretely existing world where water is composed of XYZ?

Option (2), Non-factual Actualism, is also problematic. For the Non-factual Actualists, there are no possibilia and our discourse about possibilia is intelligible, but non-factual. There isn't, then, a fact of the matter that supports our theorizing about the possibility that Saul Kripke has a son who is an astronaut; however, the claim that Saul Kripke has a son is intelligible. Sider's Humean accounts of the source of necessity are non-factual to the extent that the fundamental structure of the world is non-modal. In Chapter 3, I raised a number of problems with Sider's Humean accounts. Another non-factual account of possibilia that is worth considering is Modal Fictionalism. According to the Modal Fictionalist, there are no facts of the matter about possibilia and our discourse about possible objects and possible worlds should be understood as useful fictions. Now, there are some concerns about what a fact is and why there can't be any facts about what might have been (or might not have been) the case. But more pressing is a problem raised by Bob Hale in his article "Modal Fictionalism: A Simple Dilemma." A general version of Hale's dilemma begins with the idea that the fiction is based on a more robust modal theory – such as Lewis' Modal Realism. Let's call whatever theory the fiction is based on "RMT." The analysis of any modal claim would then be in the form

of a conditional – 'If we suppose RMT, then the modal claim … is (true or false)'. Now, the theorist will think that whatever robust modal theory she uses is in fact false, which would make it non-factual. The modal discourse, however, will be intelligible. Hale's dilemma is: is RMT contingently false or necessarily false? On the first horn of the dilemma, if RMT is contingently false, it might have been true. If that is the case, then 'If we suppose RMT, then at some possible world RMT is true' is true (Hale, 1995, p. 65). According to Hale, "since what the antecedent hypothesizes is [RMT's] truth at the actual world @, this conditional is an immediate consequence of 'If [RMT] were true at @, then [RMT] would be true at @ … and hence its consequence 'According to [RMT], there is a possible world at which [RMT] is true' – would be true, even if [RMT] were impossible" (Hale, 1995, p. 65). It appears then, that the Modal Fictionalist cannot adequately capture the contingency of RMT since her account of its contingency also works when RMT is necessarily false. On the other horn of the dilemma, if RMT is necessarily false, it could never be true. However, the Modal Fictionalist's conditional 'If we suppose RMT, then the modal claim … is (true or false)' will be vacuously true, which is problematic insofar as conditionals like 'If we suppose RMT, then the proposition that necessarily there are round squares is true' will be true, which is clearly false according RMT (Hale, 1995, p. 65). Hence, the non-factual Actualist treatment of possibilia is problematic.

Option (1), Extreme Actualism, states that there are no possibilia and our discourse about possibilia is unintelligible. For this view to be correct, all of our discourses about possible objects must be unintelligible. Yet, most of discourses about possible objects are perfectly intelligible. The sentence 'It is possible that Saul Kripke's

biological son is an astronaut' is perfectly intelligible. We know many of the conditions that need to be meet for that sentence to be true – the son must be a genetic descendant of Saul Kripke (an essential property of any biological son of Saul Kripke), the son must be an astronaut (an accidental property of the possible biological son that we are considering), etc. Since this sentence is perfectly intelligible, there is at least one sentence about a possible object that is intelligible, which makes the Extreme Actualist's claim that such sentences are unintelligible false.

It appears then that Fine's Actualism is the only Actualist account that is tenable. Is it possible to reformulate his version of Actualism so that it does not appeal to primitive modal notions? As far as I can tell there are no reformulations that will not appeal to primitive modal notions. The reason why I think this is the case is that any reformulation of Fine's Actualism must make our modal discourse about possibilia intelligible and, importantly, factual. Since we are talking about possible object (and most likely possible worlds to the extent that possible worlds semantics is the most fruitful model of modality conceived of thus far) we are going to need to appeal to modal qualities of those non-existent possible beings. For example, when theorizing about the possibility that Saul Kripke's biological son is an astronaut, we are considering something that is possible for a possible being, and this possibility is not rooted in any property had by any individual that exists in the actual world. This isn't surprising – the Actualists are not concerned with providing a reductive account of the source of necessity; rather, their theories are about (i) what objects exist and what objects don't exist, and (ii) how to accommodate our theorizing about possible objects in a theory that claims only actual objects exist.

It appears, then, that Fine's Essentialist account of the source of necessity is an incomplete Reductive Account of the source of necessity (which is something that he acknowledges in "Essence and Modality" but doesn't explain) due to his Actualist account of possible objects. There are certain metaphysical necessities of the possibilia (which, according to Fine, are factual) that are not accounted for in Fine's Essentialism. For an example, let's consider Saul Kripke's possible biological son again. It is certainly metaphysically possible that Saul Kripke could have had a biological son and if there are necessary properties (which is something that the Essentialist claims), then clearly Saul Kripke's biological son is necessarily human. Now, it is certainly conceptually necessary that that possible being has the necessary property of being human under Fine's Actualism; but that account appeals to primitive modal notions. If we are not to appeal to primitive modal notions, then we must rely on the essential properties of the objects in the actual world. Since Saul Kripke's possible son does not exist in the actual world, that possible being has no essential properties; hence, nothing is metaphysically necessarily true of that being under the Essentialist account of the source of metaphysical necessity (since metaphysical necessities like this one are, according to the Essentialist, grounded in the essences of the objects that exist in the actual world).[100] This points to a general, and as far as I can tell insurmountable, problem facing any account of the source of metaphysical necessity that tries to ground the metaphysical necessities of possible

[100] According to Fine, "if I am right, then the difference between possible and actual objects is not correctly regarded as a difference in kind. It is a difference in what one might call ontological status, of which it is for the object to be. This not to dispute that possible objects are somehow lacking in substantiality. But the lack of substantiality resides in what it is for there to be such objects rather than in the objects themselves" (Fine, 2005a, p. 14). In addition, Fine explains, "to say that some possible object is a certain way is to say that possibly some object is that way" (Fine, 2005a, p. 12). Note the primitive notion of modality at play here.

objects in the objects that exist in (or the features of) the actual world without (i) appealing to primitive notions of necessity, and (ii) without appealing to concretely existing worlds (Lewis' Modal Realism). How, exactly, do the objects in (or features of) the actual world ground the metaphysical necessities of objects that do not exist in the actual world?

Could we use general principles to account for the necessary properties of individuals that don't exist in the actual world? (Note that possible individuals do not have essential properties since they do not exist in the actual world, so we cannot use essences). We know that all biological offspring of humans in the actual world are necessarily human since they have the essential property of being human. Since we know this, we can create a general principle: All of the biological offspring of humans in the actual world are necessarily human beings. Now, as stated, this principle will not entail that Saul Kripke's son is necessarily human since it only ranges over the objects that exist in the actual world (the only things in the domain of discourse for the Actualist). For the general principle to work in the Saul Kripke case, the principle must not appeal to objects that exist in the actual world, which means that we cannot appeal to the essences of the human beings that exist in the actual world as the source of the principle's necessity to the extent that we cannot relativizing the domain of the principle to individuals to the actual world and account for Saul Kripke's son necessarily being human. So, the modified general principle would have to be: All of the biological offspring of humans are necessarily human beings. According to this principle, any being whatsoever that is the biological offspring of humans is necessarily a human being. We can now account for Saul Kripke's son having the necessary property of being

human, since it is necessarily the case that he is a human being since he is the biological offspring of Saul Kripke.

Ultimately, this response won't work for the Essentialist. Saul Kripke's son necessarily being a human has nothing to do with him having an essential property – he doesn't exist and therefore has no properties. It is the necessity of the modified general principle that supposedly makes it the case that Saul Kripke's son has the necessary property of being human. Now, according to the Essentialist, the sources of the necessities of every necessary truth are essences. The essence of our modified general principle is a characteristic concept for a general class of beings – humans (since, as explained in the previous paragraph, the source of the modified principle's necessity cannot be the humans that exist in the actual world). In other words, the essence of the modified principle is a *conceptual* truth *about the offspring of humans*. Hence, if the essence of our modified general principle is a characteristic concept for a general class of beings, then it is a conceptual truth that the biological offspring of humans are necessarily human. This is problematic for the Essentialist's account of the source of the necessity for Saul Kripke's son being necessarily human. Recall, that according to Fine, "for each class of objects, be they concepts or individuals or entities of some other kind, will give rise to its own domain of necessary truths, the truths which flow from the nature of the objects in question" (Fine, 1994, p. 9). Saul Kripke's son is not an individual or entity that exists in the actual world, so there are no truths that flow from his nature as an object. Saul Kripke's son, then, must be a concept that has truths that flow from its nature. Yet, if Saul Kripke's son is a concept, then Saul Kripke's son exists as a concept in the actual world. For Fine, concepts are types of objects, so Saul Kripke's son, a

possibilium, exists in the actual world, which is not in accordance with the Actualist claim that the only objects that exist are the actual objects. Furthermore, if it were the case that Saul Kripke's son is a concept, then the modified general principle would not apply to him. The modified general principle applies to the general class of entities that are human. The concept of Saul Kripke's son is not human and the concept of Saul Kripke's son is not the biological offspring of human beings. What, then, is the source of the necessity of Saul Kripke's son necessarily being human? The answer would be that in any possible world where Saul Kripke's son exists, he is human. This, once again, is to appeal to primitive notions of modality when talking about possible beings, which is just what Fine does in his Actualist account of possible beings. Hence, we are left once again with an incomplete reductive account of the source of necessity.[101]

5.3 Conclusion

In this chapter I have critically evaluated two nondependent accounts of the source of the necessity that make necessary truths necessarily true. I began by critiquing Lewis' Modal Realist Account. According to Lewis, the necessary truths are necessarily true because those truths are true at every concretely existing world. There are a number of objections to Lewis' Modal Realism; however, what is important for this project is whether it can be used as an account of the source of necessity. Hanks convincingly argues that if it is used as an account of the source of necessity, then new questions arise: Why are the truths

[101] Note that we have been exclusively discussing a possible being that is related to an actual being. It seems plausible that there could be possible objects that also have merely possible essential properties. If there were such possible objects and merely possible essential properties, then we could not build general necessary principles based on objects and properties that exist in the actual world. Once again, to account for these possible objects and merely possible properties, the Actualist would have to appeal to primitive modal notions.

that are true at all of the concretely existing worlds true at those worlds? Why are some truths that are true only at certain worlds not to true at every world? We cannot answer these questions by appealing to the fact that some truths are true at every possible world and others are not. That answer is tantamount to saying that it is a brute fact that certain truths are true at every possible world and others are not. If it actually is a brute fact, then it is a brute fact that the necessary truths are necessarily true and the contingent truths are contingently true. If it is a brute fact the necessary truths are necessarily true and the contingent truths are contingently true, then Modal Realism is not a reductive account of the source of necessity. Only by answering these questions will we be able to provide a reductive account of the source of the necessity that makes necessary truths necessarily true is. The prospects for answering these questions, however, are not very promising.

Next, I considered Fine's Essentialist account of the source of necessity. According to Fine, the source of necessary truths' necessities is located essences. Fine does not explain essences using modal terms (which is typically done); rather, he appeals to a notion of real definition, which for Fine is the collection of true propositions that correspond with the constitutive essential properties of that object – where the constitutive essential properties of an object are the properties that make that object what it is. It is on the basis of constitutive essences that modalities arise. For example, the proposition that water is H_2O is necessarily true and the source of its necessity can be found in the constitutive essence of water – i.e. the property that makes water water – and that constitutive essence is having two hydrogen atoms and one oxygen atom. I proposed two objections to Fine's Essentialist account of the source of necessity. I first argued that

the foundation of the Essentialist account of the source of necessity is in fact based in an unintuitive, yet non vicious, infinite hierarchy of higher-order essential properties. Now, just because this hierarchy of higher-order essential properties is unintuitive does not mean that reality is not structured that way (just as the unintuitiveness of Lewis' concretely existing possible worlds does not show that they do not exist). The more important objection that I raised is that Fine's Essentialism is an incomplete account of the source of the necessity that makes necessary truths necessarily true. Fine's Essentialism is incomplete due to his commitment to Actualism – the only objects that exist are the objects in the actual world. Fine is unable, therefore, to provide us with an account of modal properties of possible beings since they do not exist in the actual world, which means that they have no essential properties. I then explained that this is a problem for any account of the source of necessity that attempts to locate the source of necessity in the actual world. Any such account will be an incomplete account of the source of necessity.

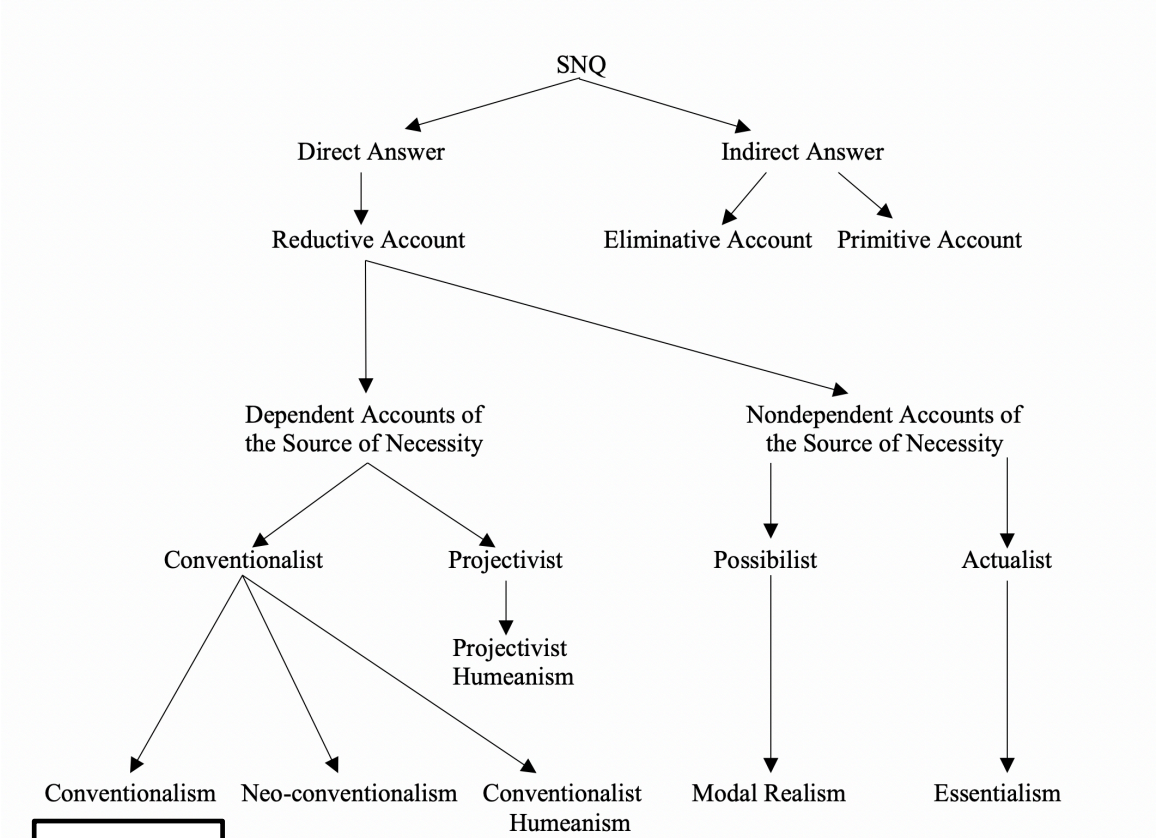
Conclusion

The preeminent question that we have been focusing on in this dissertation is SNQ: What is the source of the necessity that makes necessary truths necessarily true? There are two ways to answer this question – directly and indirectly. A Direct answer to SNQ requires the formulation of a reductive account of the source of the necessity that makes necessary truths necessarily true. Recall that Reductive Accounts of the source of necessity avoid appealing to modal notions (e.g. 'necessary', 'possible', 'contingent', 'must', etc.) in their explanations of the source of necessity. A Reductive Account of the source of necessity is required for a direct answer to SNQ to the extent that utilizing modal notions, for example 'necessary', in the explanation of the source of necessity will result in an incomplete account of the source of the necessity that makes necessary truths necessarily true. In other words, there will be necessities whose necessity is unaccounted for in the proposed theory. If there are necessities whose necessity is unaccounted for in the proposed theory, then SNQ has not been fully answered. We have examined in great detail the two types of reductive accounts of the source of necessity – Dependent Accounts of the source of necessity and Nondependent Accounts of the source of necessity.

There are, however, two indirect answers to SNQ (both discussed in the Introduction). The first indirect answer to SNQ is given by the Eliminativist who says that SNQ is nonsense. For the Eliminativist, there is no such thing as modality. When we claim that some proposition *P* is necessarily true, we are saying something that is literally false insofar as the truths expressed by propositions do not have modal profiles.

If truths expressed by propositions do not have modal profiles, then there is no source of necessity to be found. Hence, SNQ is nonsense. The second indirect answer to SNQ is given by the Primitivist who says that SNQ is unanswerable. For the Primitivist, there can be no reductive theory of modality to the extent that it is simply a brute fact that certain truths are necessarily true and other truths are contingently true. If it is a brute fact that the necessary truths are necessarily true, then there will not be an answer to SNQ insofar as SNQ is asking for the source of the necessity that makes necessary truths necessarily true. To locate the source of the necessity requires a Reductive Account of the source that, according to the Primitivist, will not be forthcoming. Hence, SNQ is unanswerable.

Given these considerations, we end up with the following (Figure I):



1.1 Figure I

As is evident above, there are a number of ways to answer SNQ. Either there is a direct answer to SNQ or there is an indirect answer to SNQ. On the one hand, if there is a direct answer to SNQ, then it is given in a Reductive Account of the source of necessity. Either the Reductive Account is a Dependent Account of the source of necessity or it's a Nondependent Account of the source of necessity. If it is a Dependent Account, then it either locates the source of necessity in our conventions or locates the source of necessity in some other aspect of our subjective natures or psychology – we project necessity. If the Dependent Account locates the source of necessity in conventions, then either (i) our conventions are the source of *both* the truth and necessity of necessary truths (Conventionalism), (ii) our conventions are the source of the necessity, but not truth, of the necessary truths via the non-natural, yet mind independent, distinction between the existent set of abstract words that is divided up into multiple complementary subset pairs that divide up the abstract worlds into possible worlds and impossible worlds one of which we have latched on to via our interests (Neo-conventionalism), or (iii) the fundamental structure of the world is nonmodal; however, by convention we label certain sorts of truths as 'necessary' (Conventionalist Humeanism).[102] If the Dependent Account locates the source of necessity is some aspect of our psychology, then we project necessity onto certain truths (Projectivst Humeanism and Combination Humeanism).[103]

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[102] Note that the Conventionalist Humean, the Projectivist Humean, and the Combination Humean are not Eliminativists. According to Sider, "[for a proposition] to be necessary is to be true and of a certain sort." Hence, there is such a thing as modality, for all versions of Humeanism, but it is not what we thought it was.

[103] I am counting Combination Humeanism as a projective account of the source of necessity given my arguments in Chapter 3. I argued that the ultimate source of necessity on a combination account is rooted in the fact that we are a certain way – we are creatures who conceptualize the world in such a way that enables us to make some truths necessary by convention and to make some truths necessary by projection. Hence, the source of the necessity is a projection of our conceptual natures.

On the other hand, if the account is a Nondependent Account of the source of necessity, then either it is a Possibilist Account – one that claims possible objects, etc. exist (Modal Realism) or it is an Actualist Account according to which the only objects that exist are the objects in the actual world (Essentialism). If the answer to SNQ is an indirect answer, then either it is an Eliminativist Account (modality does not exist) or it is a Primitivist Account (it is a brute fact that certain truths are necessary and other truths are not).

In this dissertation I have shown that Reductive Accounts of the source of necessity are untenable. I have ruled out Dependent Accounts of the source of necessity that rely on conventions with the Incompleteness Objection, which is a structural objection to all accounts that rely on conventions. I have ruled out *all* Dependent Accounts of the source of necessity (accounts that rely on conventions as well as accounts that do not rely on conventions) by arguing that they are incompatible with genuine epistemic phenomenon of global modal error. In addition, I have shown that Nondependent Accounts of the source of necessity are not tenable. Possibilist accounts of the source of necessity – e.g. Modal Realist accounts – are problematic insofar as they replace one tough question – What is the source of the necessity that makes necessary truths necessarily true? – with another equally tough question – Why are those truths true at every concretely existing world? Actualist Accounts that claim the only things that exist are the things that exist in the actual (i.e. our) world are also problematic. Locating the source of necessity in the actual world leaves the Actualist lacking the resources to account for the necessary truths associate with possible beings. In what follows, I will highlight the arguments against Reductive Accounts of the source of necessity presented in this dissertation. I will then argue in favor of a Primitivist Account of the source of

necessity over an Eliminativist Account. Lastly, I will provide some suggestions for future research.

C.1 Ruling Out Dependent Accounts of the Source of Necessity

The three Dependent Accounts of the source of necessity that utilize conventions in their accounts of the source of necessity are all susceptible to my two structural objections: (i) accounts of the source of necessity that utilize conventions are all susceptible the Incompleteness Objection, and (ii) accounts of the source of necessity that utilize conventions are all incompatible with global modal error.

In Chapter 1, we considered the Conventionalist account of the source of necessity. The development of the Incompleteness Objection for Conventionalism involved three sentences that are necessarily true but whose necessity cannot be located in conventions. Most notably, the sentence "all practical linguistic frameworks for our factual knowledge of the world have characterization rules that provide us with guidance (to varying degrees) for applying the predicates of the linguistic frameworks to the objects that we experience," which has to do with Carnap's practical account of linguistic framework choice. I called this sentence "PRACframework". Now, PRACframework must be necessarily true since if it were false, then the linguistic framework for our factual knowledge would not have characterization rules, which would make it an impractical linguistic framework. The source of the necessity of the truth expressed in PRACframework cannot be located in a convention to the extent that PRACframework is not an analytic truth (the only kinds of truths that are necessarily true via linguistic frameworks). In addition, I recounted Quine's objection to Conventionalism in Chapter 1. Quine argued that there must be logical truths to create the conventions for logic,

which means that the laws of logic, which are necessary, must be taken as primitive. Lastly, in Chapter 4, I showed that Conventionalism is incompatible with global modal error. Suppose at time t_1 we think proposition *P* is contingently true. At time t_2, when we think proposition *P* is necessarily true, it cannot be the case that we mistakenly constructed a linguistic framework at time t_1 that makes proposition *P* contingently true to the extent that if we were making a mistake at time t_1, then proposition *P* is necessarily true even though we did not construct a framework that makes it necessarily true at time t_1. In other words, proposition *P*'s necessity is not located in the rules or analytic sentences of the linguistic framework that we constructed at time t_1, which is contra to the Conventionalist's account of the source of necessity. Hence, we did not make a mistake at time t_1, which makes Conventionalism incompatible with global modal error. Therefore, Conventionalism is not a viable account of the source of necessity.

In Chapter 2, we considered the Neo-conventionalist account of the source of necessity. Recall that for the Neo-conventionalist, it is not the case that all of the possible worlds have something that the impossible worlds lack that allows them represent a way the world could be (there is no natural distinction between the possible worlds and the impossible worlds that we are latching onto). Rather, it is through a convention that we decided, based on our interests, to latch onto one of the complementary subset pairs of W, which is the set of all worlds, thereby dividing up the worlds into *the* possible worlds and *the* impossible worlds that we know and love today. There is really nothing special about the possible worlds other than they are the worlds where what we consider to be important truths – mathematical, logical, and metaphysical truths – are true. If we had different interests, we could have decided to divide the worlds differently by latching

onto a different complementary subset pair of W. I used the following proposition in my development of the Incompleteness Objection applied to Neo-conventionalism:

> **NO-NATURAL:** There is no natural distinction (one that cuts nature at the joints) between the possible world and the impossible worlds.

Now, NO-NATURAL must be necessarily true if Neo-conventionalism is the correct theory of the source of necessity. In other words, no matter which complementary subset pair of W that we latch onto based on our interests, NO-NATURAL will be necessarily true in that complementary subset pair. The necessity of NO-NATURAL is not, then, located in our selection of a complementary subset pair of W that divides the worlds up into possible worlds and impossible worlds; rather, the source of its necessity is natural distinction between the worlds in W that can serve as possible worlds (worlds where NO-NATURAL is true) and the worlds in W that must be impossible worlds (worlds where NO-NATRUAL is false). Hence, our convention for choosing a complementary subset pair of W is not the source of the necessity of NO-NATURAL. Ergo, Neo-conventionalism is an incomplete account of the source of necessity. In addition, I raised what I called the "Stroud Argument". In the Stroud Argument, it was shown that even if there are multiple complementary subset pairs of W, we cannot latch onto any complementary subset pair of W where one of the mathematical, logical, or even metaphysical truths (such as the necessity of identity) is either contingently true or necessarily false. To do so would be completely unintelligible to us. Since these are the necessary truths that we are considering, it must be the case that we don't determine which worlds are *the* possible worlds and which worlds are *the* impossible worlds (i.e. the one's that we have chosen); hence, the Neo-conventionalist's claim that we do determine,

by convention, which worlds are *the* possible worlds and which worlds are *the* impossible worlds is incorrect. Lastly, I showed that Neo-conventionalism is incompatible with global modal error in Chapter 4. Suppose at time t_1 we think proposition *P* is contingently true. At time t_2, when we think that proposition *P* is necessarily true, it cannot be the case that we mistakenly latched onto a complementary subset of W, based on interests, at time t_1 that makes proposition *P* contingently true. If we were making a mistake at time t_1, then proposition *P* is necessarily true even though our interests at t_1 are not aligned with us latching onto a complementary subset of W that makes *P* necessarily true. In other words, proposition *P*'s necessity is not located in our latching on to a complementary subset of W based on our interest at time t_1, which is contra to the Neo-conventionalist's account of the source of necessity. Hence, we did not make a mistake latching onto the complementary subset of W that we latched onto at time t_1, which makes Neo-conventionalism incompatible with global modal error. Given these considerations, Neo-conventionalism is not a viable account of the source of necessity.

The last conventionalist account of the source of necessity that we considered was Sider's Conventionalist Humeanism in Chapter 3. For the Conventionalist Humean, the fundamental structure of the world is nonmodal. Modality is determined by us – we label certain sorts of truths as 'necessary'. Recall that Sider contends that there must be an arbitrary selection made between at least two equally good alternative candidates in order for there to be a convention. According to Conventionalist Humean, there are multiple candidates that we could have chosen to label as 'necessary' (that will fulfill our semantic goals for 'necessary') – all that is required is that they are true and of a certain sort (i.e. important to whatever aims the linguistic community has – nothing "metaphysical deep").

This choice between which truths we label as 'necessary' is an arbitrary choice insofar as whichever candidate that we choose will carve nature at the joints equally well (since none of them will carve nature at the joints). In my formulation of the Incompleteness Objection to Conventional Humeanism, two of the propositions I used were:

PROP-Select: If there was a convention, then we selected a candidate.

PROP-Arbitrary: If there was a convention, then we arbitrarily chose one of the candidates.

Both PROP-Select and PROP-Arbitrary must be necessarily true if Conventionalist Humeanism is the correct account of the source of necessity. The problem with this is that if PROP-Select and PROP-Arbitrary must be true, then there are no alternative candidates to label 'necessary' for us to select from. If there are no alternative candidates to label 'necessary' for us to select from, then there was no convention (since for Sider, to have a convention means to make an arbitrary choice between at least two equally good candidates). Hence, Conventionalist Humeanism is, at best, an incomplete account of the source of necessity. I also raised the Stroud Objection against Conventionalist Humeanism. In that argument I showed that we do not have a choice when it comes to which truths that we label 'necessary' to the extent that all alternative candidates are unintelligible and would not allow us to accomplish our semantic goals with 'necessary' (e.g. to build possible worlds to talk about other kinds of modality). Lastly, I showed that Conventionalist Humeanism is incompatible with global modal error in Chapter 4. Suppose at time t_1 we think proposition *P* is contingently true. At time t_2, when we think that proposition *P* is necessarily true, it cannot be the case that we mistakenly labeled proposition *P* as 'contingent' at time t_1. If we were making a mistake at time t_1, then

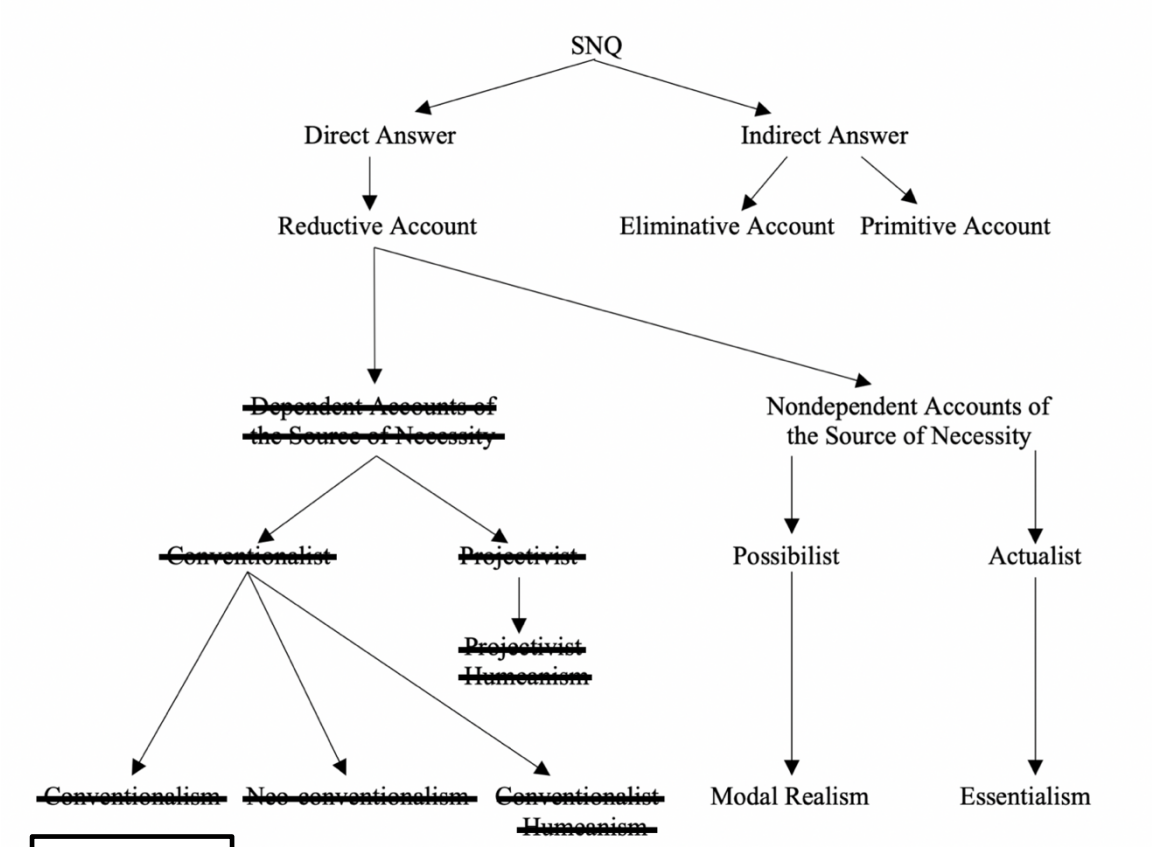
proposition *P* is necessarily true even though we labeled it as 'contingent'. There are two ways in which proposition *P* could be necessarily true at time t_1 if we didn't label it as 'necessary': (i) proposition *P* cuts nature at the joint, or (ii) proposition *P*'s necessity is not arbitrary. Now, Sider does thinks that the fundamental structure of the world is nonmodal, so the fundamental structure of the world cannot be the source of proposition *P*'s necessity at time t_1. So, option (i) is a nonstarter. The other possible account of proposition *P*'s necessity at time t_1 is that there was no arbitrary choice at time t_1 about the modal profile of proposition *P*. This account is problematic for two reasons. First, if true, then Conventionalist Humeanism is an incomplete account of the source of necessity since there is a necessary truth that is not necessary by convention. Second, if there is no arbitrary choice in labeling proposition *P* as 'necessary' because of the way we are, then why did we label it as 'contingent'? Neither of these accounts of the source of proposition *P*'s necessity cohere well with Conventionalist Humeanism. Hence, if Conventionalist Humeanism is the correct account of the source of necessity, then we did not make a mistake labeling proposition *P* as 'necessary' at time t_1, which makes Neo-conventionalism incompatible with global modal error. Therefore, Conventionalist Humeanism is not a viable account of the source of necessity.

Given these arguments, Dependent Accounts of the source of necessity that rely on conventions are unsuitable accounts of the source of necessity. First, conventions cannot provide us with a suitable basis for the source of the necessity for all necessary truths. In addition, Conventionalist accounts of the source of necessity are incompatible with global modal error.

The other type of Dependent Account of the source of necessity that we evaluated, Projective Humeanism, locates the source of the necessity that makes necessary truths necessarily true in our subjective natures. Recall that for the Projectivist Humean, the decision to label certain truths, such as the mathematical, logical, and metaphysical truths, as 'necessary' is not based on an arbitrary choice. Rather, there is something about us that makes it the case that we label certain truths as 'necessary'. I provided two possible accounts of why we label certain truths as 'necessary'. The first account was based on some insights from Stroud. When we think of different ways the world could be, there are certain truths that must be true in those scenarios – such as the mathematical, logical, and certain metaphysical truths. Any scenario where those truths are not true is unintelligible to us. For example, any scenario where the proposition that 2 + 3 = 7 is true is unintelligible. The problem with this account of why we label certain truths as 'necessary' is fleshing out the idea of *intelligibility*. For many, true contradictions are unintelligible. For others, however, true contradictions are intelligible. For instance, many physicists are comfortable with the thought that electrons are both particles and not particles (waves). Moreover, there is disagreement about which propositions are intelligible and which propositions are unintelligible. For some, the Continuum Hypothesis is intelligible. For others, the Continuum Hypothesis is unintelligible. Given these considerations, I formulated an alternative account of why we label certain truths as 'necessary' based on our subjective natures. This account is based on Wittgenstein's 'form of life', which appears to me to be a deflationary tool for explaining why we do certain things. Certain truths play a crucial role in our intellectual lives and these are the truths that we label 'necessary'. The only explanation of why

those truths have the role that they have is that they are paramount for how we understand the world. In other words, because we are the creatures that we are – we have this form of life – those truths are the truths that we will label as 'necessary'. In Chapter 3, I claimed that I thought that this Dependent Account of the source of necessity was the most promising Dependent Account. Nevertheless, it is incompatible with global modal error. Suppose at time t_1 we think proposition *P* is contingently true. The modality of proposition *P* is based on our form of life at time t_1. At time t_2, when we think that proposition *P* is necessarily true and so label it, it cannot be the case that we mistakenly labeled proposition *P* as 'contingent' at time t_1. If we were making a mistake at time t_1, then proposition *P* is necessarily true at time t_1 whether we label it as 'necessary' or not. But how could that be the case if modality is dependent on our form of life? If *P* is necessarily true at time t_1, then we are not the source of its necessity. Hence, if this version of Projectivist Humeanism is correct, then we did not make a mistake at time t_1 when we labeled proposition *P* as 'necessary', which makes the most promising Dependent Account of the source of necessity incompatible with global modal error.

Given these arguments against Dependent Accounts of the source of necessity and the generalizability of the incompatibility of Dependent Accounts of the source of necessity with global modal error (which can be summed up with the following question – If we are the source of the necessity that makes necessary truths necessarily true, how can we be mistaken about which truths are necessary?), we have ruled out one of the possible reductive answers to SNQ. The source of the necessity that makes necessary truths necessarily true is not dependent on us (see Figure II, page 278).



1.2 Figure II

C.2 Ruling Out Nondependent Accounts of the Source of Necessity

The other type of Reductive Account of the source of necessity is Nondependent Accounts, which were discussed in length in Chapter 5. Nondependent Accounts of the source of necessity are either Possibilist Accounts (possible worlds, individuals, properties, etc. all exist) or Actualist Accounts (the only things that exist are the things that exist in the actual world).

The only Reductive Nondependent Account of the source of necessity that is a Possibilist Account is Modal Realism. Recall, the Ersatzers' conceptions of possible worlds, as explained in Chapter 2, all rely on modal notions (e.g. consistency), so they are not Reductive Accounts of the source of necessity. Now, according to Lewis, the

possible worlds are concretely existing (i.e. non-abstract), non-spatiotemporally related, worlds. Necessary truths are necessarily true because they are true at all of the concretely existing worlds (i.e. the semantics of 'necessary' is treated as universal quantification over all concretely existing worlds). A Modal Realist account of the source of necessity could take Lewis' theoretical framework and claim that the source of the necessity that makes necessary truths necessarily true is located in the concretely existing worlds. There have been a number of objections to Lewis' Modal Realism, but Hanks' objection to a Modal Realist account of the source of necessity is most relevant for our purposes. Hanks argues that using concretely existing worlds as an account of the source of necessity leads to a question about why certain truths are true at all of the concretely existing worlds whereas other truths are not true at all (or any) of the concretely existing worlds. The prospects for answering this question don't seem promising. The Modal Realist cannot say that those truths that are true at all the concretely existing worlds are true at those worlds because they are necessary. To do so would be circular. It is unclear what explanation that the Modal Realist could give to explain why the truths that are true at every concretely existing world are true at those worlds. The Modal Realist could say that it is a primitive fact that those truths are true at all of the concretely existing worlds. This response, however, is not very satisfying insofar as we are not getting much of a reductive explanation. A Primitive Account of certain truths being true at every concretely existing world actually seems worse than a Primitive Account of the source of necessity to the extent that a Primitive Account of the source of necessity does not have to rely on a bloated ontology. So, the Modal Realist was supposed to be giving us a reductive account of the source of the necessity that makes necessary truths necessarily

true. The answer we were given – that the concretely existing worlds are the source of necessity – is (i) not much of a reduction, and (ii) leaves us with equally problematic questions. What makes it the case that certain truths are true at every concretely existing world? Why does a world where 2 + 3 = 7 not exist? Why is it impossible for nothing to exist?

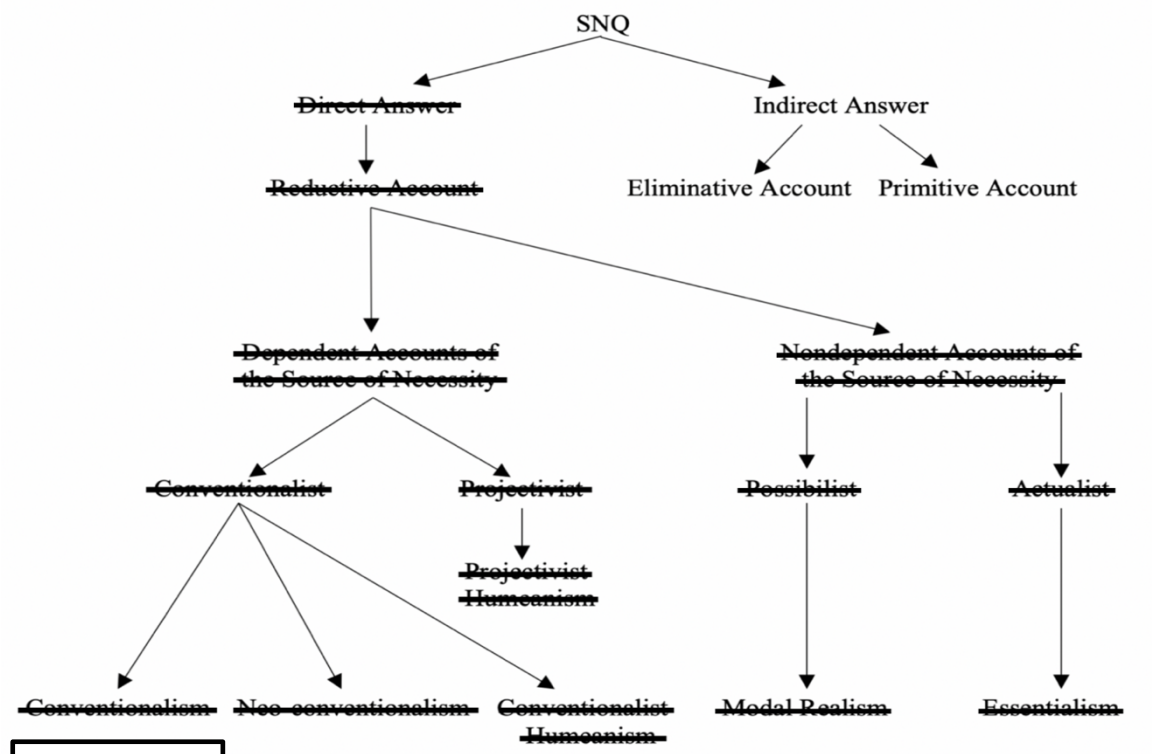
Actualists claim that the only things (objects, properties, etc.) that exist are things that exist in the actual world. The Actualist Account that I considered in Chapter 5 was Fine's Essentialism. Recall that Fine reverses the order of explanation for essential properties. Typically, essences and essential properties are explained in terms of modality. For example, X is an essential property of A because A necessarily has property X. According to Fine, the essence of an object O is the real definition of the object, and the real definition of an object O is nothing other than the true propositions that correspond with the essential properties of O. In other words, essential properties are the properties that an object O has that make it object O and those essential properties give us propositions that give us the real definition of object O. The source of the necessity that makes necessary truths necessarily true "flows from the nature" of the entities (objects, properties, etc.) being considered. In other words, the real definitions of objects, properties, etc. is the source of the necessity that makes certain truths necessarily true. Now, Fine acknowledges that this cannot be a complete account of the source of necessity, but he does not explain why. The major problem with the Essentialist Account of the source of necessity that I highlighted is that it cannot provide us with an account of the necessary or contingent truths that follow from possible beings (i.e. beings that don't exist in the actual world). For example, it is possible that there is some substance that has

all the same properties and uses of H_2O but is composed of XYZ. Let's call that substance "T-water". Since T-water doesn't exist in the actual world, there are no true propositions about T-water. If there are no true proposition about T-water, then there is no real definition of T-water. If there is no real definition of water, then T-water doesn't have any essential properties. If T-water doesn't have any essential properties, then nothing is metaphysically necessarily true of T-water. Yet, clearly XYZ is necessarily not identical to H_2O. There is no way to account for this using the Essentialist Account of the source of necessity. And this is a problem for any account of the source of necessity that tries to locate the source of necessity in the actual world. How, exactly, do the objects in (or features of) the actual world ground the metaphysical necessities of objects that do not exist in the actual world?

Given the arguments against Nondependent Accounts of the source of necessity, it seems to me that any hope of a Reductive Account of the source of necessity will be a Possibilist Account. The Possibilist Account of the source of necessity will be a Modal Realist account. As explained above, the Modal Realist account is problematic. Therefore, a Direct Answer to SNQ via a Reductive Account of the source of necessity will not be forthcoming (see Figure III, page 282).

C.3 Indirect Answers to SNQ

What we are left with, then, are the two indirect answers to SNQ: an Eliminitivist answer and a Primitivist answer. As explained in the Introduction, the Eliminativist claims that (i) there are no possible worlds, and (ii) there are no modal facts. In other words, there is



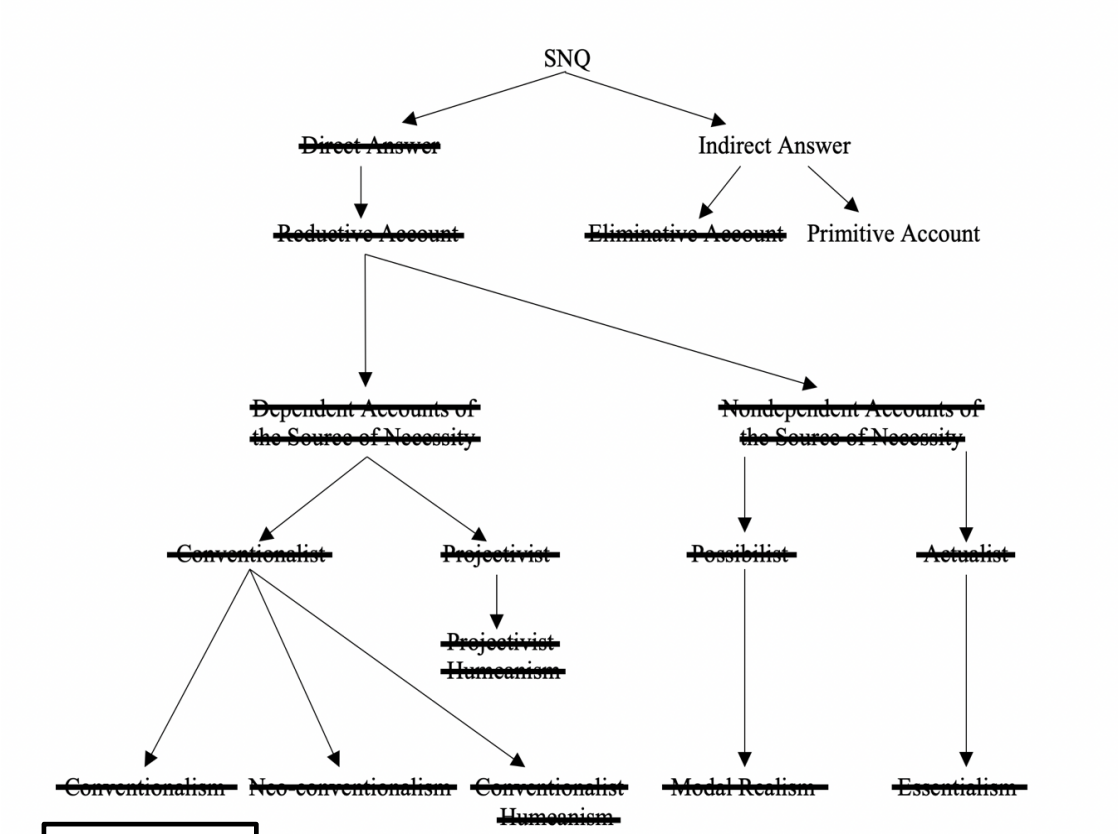
1.3 Figure III

no such thing as modality. The Eliminativist position is highly unintuitive. We clearly use modal notions in our language. If there is no such thing as modality, then we are all making a mistake when we claim something is possible or something is necessary. It seems to me that the Eliminativist will perhaps end up providing us with an error theory that is very much in the spirit of Projectivist Humean (it's important to note that Sider is not an eliminativist – he clearly states that Humeanism – all versions – is a reductive account). We clearly use modal notions all the time even though there is no such thing as modality. The reason why we use modal notions is that we are the creatures that we are. Nevertheless, it seems highly unintuitive to me that we are always making a mistake when we say something is possible or when we say something is necessary. Furthermore, the truths expressed in the proposition that Justin is Justin and the proposition that Justin

resides in North America are different. If there is no modality, then we are left with very little to use to explain why these two true propositions are different. Lastly, as claimed in the Introduction, it seems highly intuitive to me that the proposition that Jane and John Clemens are Samuel Clemens' parents, but not Mark Twain's parents is necessarily false – I have high confidence in the modality of that proposition.

This leaves us with Primitivism. There is no direct answer to SNQ because SNQ is asking us for an account of something that we cannot give. What SNQ demands is an account of the *source* of the necessity that makes necessary truths necessarily true. However, as we have seen, Reductive Accounts of the source of necessity are not tenable. This suggests that modality is not analyzable – it is simple a brute fact that certain truths are necessarily true and other truths are contingently true. Now, the Modal Realist can say that modality is analyzable in terms of concretely existing worlds. This, however, is really not much of an improvement over modality being primitive to the extent that the Modal Realist will need to provide us with an explanation of why certain truths are true at all of the concretely existing worlds in order to provide us with a thorough answer to SNQ.[104] Most likely the account will be that it is a brute fact that certain truths are true at every concretely existing world. The advantage of Primitivism about modality over Modal Realism, then, is ontological parsimony (see Figure IV, page 284).

[104] The Modal Realist will not be able to appeal to modal notions, so it seems to me that they will end up claiming that it is a brute fact that certain truths are true at every possible world. Utilizing Lewis' Recombination Principle will be of no help here since it simply explains the recombination of things into worlds but not why some things (e.g. the proposition that 2 + 2 = 5) can never be combined to a world or why other things (e.g. the proposition that 2 + 2 = 5) are parts of every world.



1.4 Figure IV

C.4 Future Research

One problem that is at the forefront of the epistemology of modality is providing an account of how we have access to modal facts. One of the most prominent types of accounts of the epistemology of modality claims that conceivability is a good guide to what is possible. Now, I have argued that it is a brute fact that certain truths are necessarily true and other truths are contingently true. Given this account of modality, is conceivability a good guide to possibility? My tentative answer is that conceivability is at best a partial guide to what is possible. If conceivability were an exact guide to what is possible, then we would never be mistaken about the modal profile of a proposition. This seems to conflict with global modal error, which suggests that really strong

conceivability accounts of the epistemology of modality might be relying on Dependent Accounts of the source of necessity. Now, if conceivability is only a partial guide to possibility, then how do we know which truths are necessarily true and which truths are contingently true? This is a question that I plan on fully addressing in the future. My tentative answer to this question is that we create linguistic/mental models (something akin to scientific models) that somehow approximately represent the brute modal structure of the world. This leads directly to thinking about ways in which we might have access to brute modal facts. I think that answering the question of how we have access to brute modal facts is paramount for providing an effective response to Eliminativism that does not rely on intuitions.

My tentative answer to the epistemological question above was that we create linguistic/mental models (something akin to scientific models) that somehow represent the brute modal structure of the world. So, how should we understand/analyze those models of modality? Since these are *our* representations of the brute modal structure of the world and there is always the possibility of modal error, it seems to me that the only way to understand/analyze those models of modality is through an account of hyperintensional semantics that does not appeal to possible world semantics. Part of my future research, then, would be to develop a hyperintensional account of the models that we use to model modality. This could give us some insight into the role modal claims should play our theorizing.

Lastly, given all of this, I would also like to consider whether the Primitivist account has any bearing on the question of the ontology of possible worlds. Are possible worlds abstract objects that actually exist if modality is primitive? Are our models of the

brute modal structure of the world models of abstract possible worlds? It seems to me that my arguments against the Essentialist Account of the source of necessity suggest that abstract possible worlds do in fact exist. Their existence is necessary to account for the necessary attributes of possible beings. If abstract possible worlds do exist, what is the most plausible account of what they are? Are they consistent sets of propositions? Are they convenient fictions that we have created to explain the semantics of our modal terms but do not explain the underlying modal phenomenon? Or is the Modal Realist's account of the semantics of our modal terms correct even if her reductive account of the source of necessity is incorrect? Or is a deflationary theory of possible worlds more tenable?

Bibliography

Aristotle. (1941). *Metaphysics*. In Richard McKeon (Ed.) and W. D. Ross (Trans.), *The Basic Works of Aristotle* (pp. 681 – 926). New York: Random House, Inc.

Armstrong, D. M. (1989). *A Combinatorial Theory of Possibility*. New York: Cambridge University Press.

Audi, P. (2012). "Grounding: Toward a Theory of the *In-Virtue-Of* Relation." *Journal of Philosophy*, 109 (pp. 685 – 711).

Ayer, A.J. (1952). *Language, Truth, and Logic 2nd ed.* New York, NY: Dover.

Bealer, G. (2004). "The Origins of Modal Error." *Dialectica, 58(1)*, (pp. 11- 42).

Blackburn, P., de Rijke, M., Venema, Y. (2001). *Modal Logic*. New York: Cambridge University Press.

Blackburn, S. (1993). "Modals and Morals." In his *Essays in Quasi-realism*. Oxford: Oxford University Press.

Cameron, R. P. (2009). "What's Metaphysical About Metaphysical Necessity?" *Philosophy and Phenomenological Research, 79(1)*, (pp. 1 – 16).

Cameron, R. P. (2010a). "On the Source of Necessity." In Bob Hale & Aviv Hoffmann (Eds.), *Modality: Metaphysics, Logic, and Epistemology* (pp. 137 – 152). Oxford: Oxford University Press.

Cameron, R. P. (2010b). "The Grounds of Necessity." *Philosophy Compass, 5(4),* (pp. 348 – 358).

Carnap, R. (1956a). "Empiricism, Semantics, and Ontology." In Rudolf Carnap, *Meaning and Necessity: A Study in Semantics and Modal Logic* (pp. 205 – 221). Chicago: The University of Chicago Press.

Carnap, R. (1956b). *Meaning and Necessity: A Study in Semantics and Modal Logic*. Chicago: The University of Chicago Press.

Carnap, R. (1956c). "Meaning Postulates." In Rudolf Carnap, *Meaning and Necessity: A Study in Semantics and Modal Logic* (pp. 222 – 229). Chicago: The University of Chicago Press.

Carnap, R. (1967). *The Logical Structure of the World / Pseudoproblems in Philosophy*. Trans. Rolf A. George. Berkeley and Los Angeles: University of California Press.

Carnap, R. (2005). "The Elimination of Metaphysics Through Logical Analysis of Language." In Hazard Adams & Leroy Searle (Eds.), *Critical Theory Since Plato* (pp. 980 – 989). Boston: Thomson/Wadsworth Publishing.

Chalmers, D. J. (1996). *The Conscious Mind: In Search of a Fundamental Theory*. Oxford: Oxford University Press.

Chalmers, D. J. (2004). "Epistemic Two-Dimensional Semantics." *Philosophical Studies*, 118, (pp. 153 – 226).

Correia, F. (2007). "(Finean) Essence and (Priorean) Modality." *dialectica, Vol. 61, No. 1*, (63 – 84).

Davies, M. & Humberstone, L. (1980). "Two Notions of Necessity." *Philosophical Studies,* 38, (pp. 1 – 30).

Divers, J. (1999). "A Genuine Realist Theory of Advanced Modalizing." *Mind* Vol. 108 (pp. 217 – 239).

Dummett, M. (1991). *The Logical Basis of Metaphysics: The William James Lectures*. Cambridge, MA: Harvard University Press.

Fine, K. (1994). "Essence and Modality." In J.Thomberlin (Ed.), *Philosophical Perspectives, 8* (pp. 1 – 16).

Fine, K. (1995). "Ontological Dependence." *Proceedings of the Aristotelian Society, New Series, Vol. 95*, (pp. 269 – 290).

Fine, K. (2005a). *Modality and Tense: Philosophical Papers*. Oxford: Clarendon Press.

Fine, K. (2005c). "Plantinga on the Reduction of Possibilist Discourse." In Kit Fine (Ed.), *Modality and Tense: Philosophical Papers* (pp. 214 -231). Oxford: Clarendon Press.

Fine, K. (2005c). "The Problem of Possibilia." In Kit Fine (Ed.), *Modality and Tense: Philosophical Papers* (pp. 214 -231). Oxford: Clarendon Press.

Fine, K. (2007). "Response to Fabrice Correia." *dialectica, Vol. 61, No. 1*, (pp. 85 – 88).

Fine, K. (2010). "Semantic Necessity." In Bob Hale & Aviv Hoffmann (Eds.), *Modality: Metaphysics, Logic, and Epistemology* (pp. 65 – 80). Oxford: Oxford University Press.

Fine, K. (2012). "A Guide to Ground." In Correia and Schnieder (Eds.), *Metaphysical Grounding: Understanding the Structure of Reality* (pp. 37 – 80). Cambridge: Cambridge University Press.

Fitting, M. & Mendelsohn (1998). *First Order Modal Logic*. Dordrecht: Kluwer Academic Publishers.

Forbes, G. (1986). *The Metaphysics of Modality*. Oxford: Oxford University Press.

Fritz, P. (2014). "What is the Correct Logic of Necessity, Actuality, and Apriority?" *The Review of Symbolic Logic* Vol. 7, Num. 3, (pp. 385 – 413).

Hale, B. (1995). "Modal Fictionalism: A Simple Dilemma." *Analysis, Vol. 55, No. 2*, (pp. 63 – 67)

Hale, B. (2002). "The Source of Necessity." In J. Tomberlin (Ed.), *Philosophical Perspectives, 16* (pp. 299 – 319).

Hale, B. (2003). "Knowledge of Possibility and Necessity." *Proceedings of the Aristotelian Society*, 103 (1) (pp. 1 – 20).

Hale, B. (2013). *Necessary Beings: An Essay on Ontology, Modality, and the Relations Between Them*. Oxford: Oxford University Press.

Hanson, W. H. (2006). "Actuality, Necessity, and Logical Truth." *Philosophical Studies*, 130, (pp. 437 – 459).

Hanks, P. W. (2007). "A Dilemma About Necessity." *Erkenntnis, 68, 2008.* (pp. 129 – 148).

Hellman, G. (1989). *Mathematics Without Numbers: Towards a Modal-Structural Interpretation*. Oxford: Oxford University Press.

Hume, D. (1993). *An Enquiry Concerning Human Understanding: Second Edition.* (Ed.) Eric Steinberg. Indianapolis, IN: Hackett Publishing Company, INC.

Jackson, F. (2010). "Possible Worlds and the Necessary *A Posteriori*." In Bob Hale & Aviv Hoffmann (Eds.), *Modality: Metaphysics, Logic, and Epistemology* (pp. 257 – 266). Oxford: Oxford University Press.

Kment, B. (2006). "Counterfactual and the Analysis of Necessity." *Philosophical Perspectives*, 20 (pp. 237 – 302).

Kment, B. (2014). *Modality and Explanatory Reasoning*. Oxford: Oxford University Press.

Kripke, S. (1980). *Naming and Necessity.* Cambridge, MA: Harvard University Press.

Leuenberger, S. (2014). "Grounding and Necessity." *Inquiry*, 57 (pp. 151 -174).

Lewis, D. (1973). *Counterfactuals*. Malden, MA: Blackwell Publishing.

Lewis, D. (1986). *On the Plurality of Worlds.* Malden, MA: Blackwell Publishing.

Livingstone-Banks, J. (2017). "In Defence of Modal Essentialism." *Inquiry 60:8*, (pp. 816 – 838).

Locke, J. (1996). *An Essay Concerning Human Understanding* (K. P. Winkler, Ed.). Indianapolis: Hackett Publishing Company.

Melia, J. (2008). "Ersatz Possible Worlds." In Theodore Sider, John Hawthorne, & Dean Zimmerman (Eds.), *Contemporary Debates in Metaphysics* (pp. 135 – 151). Malden, MA: Blackwell Publishing.

Menzies, P. (1998). "Possibility and Conceivability: A Response-Dependent Account of Their Connections." *European Review of Philosophy,* 3 (pp. 255 – 277).

Nicholas, S. (2006). "Imaginative Blocks and Impossibility: An Essay in Modal Psychology." In Shaun Nicholas (Ed.), *The Architecture of the Imagination* (pp. 237 - 256). Oxford: Oxford University Press.

Nolan, D. (1997). "Three Problems for "Strong" Modal Fictionalism." *Philosophical Studies, Vol. 87, Iss. 3*, (pp. 259 – 275).

Peacocke, C. (1997). "Metaphysical Necessity: Understanding, Truth, and Epistemology." *Mind* 106 (pp. 521 – 574).

Peacocke, C. (1999). *Being Known*. Oxford: Clarendon Press.

Plantinga, A. (2003). *Essays in the Metaphysics of Modality*. Oxford: Oxford University Press.

Putnam, H. (1975). "The Meaning of 'Meaning'." *Minnesota Studies in the Philosophy of Science 7*, (pp. 131 – 193).

Putnam, H. (2008). "Meaning and Reference (1973)." In A.P. Martinich (Ed.), *The Philosophy of Language* (5th ed.) (pp. 306 - 313). New York, NY: Oxford University Press.

Quine, W. V. (1976a). "Carnap and Logical Truth." In Willard B. Quine (Ed.), *The Ways of Paradox, and Other Essays* (pp. 107 – 132), Cambridge: Harvard University Press.

Quine, W.V. (1976b). *The Ways of Paradox, and Other Essays*. Cambridge: Harvard University Press.

Quine, W.V. (1976c). "Truth by Convention." In Willard V. Quine (Ed.), *The Ways of Paradox, and Other Essays* (pp. 77 – 106). Cambridge: Harvard University Press.

Quine, W.V.O. (1976d). "Worlds Away." *Journal of Philosophy*, *73*, (pp. 859 – 863).

Rasmussen, J. (2014). "Continuity as a Guide to Possibility." *Australasian Journal of Philosophy*, 92(3) (pp. 525 – 538).

Restall, G. (1996). "Truthmakers, Entailment, and Necessity." *Australasian Journal of Philosophy*, 74 (pp. 331 – 340).

Rosen, G. (1990). "Modal Fictionalism." *Mind, Vol. 99, No. 396*, (pp. 327 – 354).

Rosen, G. (2010). "Metaphysical Dependence: Grounding and Reduction." In Bob Hale & Aviv Hoffmann (Eds.), *Modality: Metaphysics, Logic, and Epistemology* (pp. 109 – 136). Oxford: Oxford University Press.

Rosen, G. (2015). "Real Definition." *Analytic Philosophy, Vol. 56, No. 3*, (pp. 189 – 209).

Schaffer, J. (2008). "Truth-maker Commitments." *Philosophical Studies*, 141 (pp. 7 -19).

Schaffer, J. (2009). "On What Grounds What." In D. Chalmers, D. Manley, & R. Wasserman (Eds.) *Metametaphysics* (pp. 347 – 383). Oxford: Oxford University Press.

Schaffer, J. (2010). "The Least Discerning and Most Promiscuous Truth-maker." *Philosophical Quarterly*, 60 (pp. 307 – 324).

Schnieder, B. (2006). "Truth-making without Truth-makers." *Synthese*, 152 (pp. 21 – 46).

Sidelle, A. (1989). *Necessity, Essence, and Individuation: A Defense of Conventionalism*. Ithaca: Cornell University Press.

Sider, T. (2003). "Reductive Theories of Modality." In M. Loux & D. Zimmerman (Eds.), *The Oxford Handbook of Metaphysics* (pp. 180 – 208). Oxford: Oxford University Press.

Sider, T. (2012). *Writing the Book of the World*. Oxford: Oxford University Press.

Sipka, T. (2002). "Alfred Bray Kempe's "Proof" of the Four-Color Theorem." *Math Horizons*, Vol. 10, No. 2, (pp. 21 – 23, 26).

Soames, S. (2005). *Reference and Description: The Case Against Two-Dimensionalism*. Princeton: Princeton University Press.

Sorenson, R. (2006). "Meta-conceivability and Thought Experiments." In Shaun Nichlos (Ed.), *The Architecture of the Imagination: New Essays on Pretense, Possibility, and Fiction* (pp. 257 - 272). Oxford: Oxford University Press.

Spinoza, B. (1992). *The Ethics*. In Samuel Shirley (Trans.) and Seymore Feldman (Ed.), *The Ethics: Treatise on the Emendation of the Intellect and Selected Letters* (pp. 31 – 223). Indianapolis: Hackett Publishing Company.

Stalnaker, R. (2012). *Mere Possibilities: Metaphysical Foundations of Modal Semantics*. Princeton: Princeton University Press.

Stroud, B. (2000). "Wittgenstein and Logical Necessity." In Barry Stroud (Ed.), *Meaning, Understanding, and Practice* (pp. 1 – 16). Oxford: Oxford University Press.

Trogdon, K. (2013). "Grounding: Necessary or Contingent?" *Pacific Philosophical Quaterly*, 94 (pp. 465 – 485).

Williamson, T. (2007). "Philosophical Knowledge and Knowledge of Counterfactuals." *Grazer Philosophiche Studien*, 74 (pp. 89 – 123).

Williamson, T. (2013). *Modal Logic as Metaphysics*. Oxford: Oxford University Press.

Wittgenstein, L. (1974). *Tractatus Logico-Philosophicus*. (D. F. Pears and B. F. McGuinness, Trans.). New York: Routledge.

Wittgenstein, L. (2009). *Philosophical Investigations* (P. M. S. Hacker & J. Schulte, Trans.). Malden, MA: Blackwell Publishing. (Original work published 1953).

Wright, C. (2002). "On Knowing What is Necessary: Three Limitations of Peacocke's Account." *Philosophy and Phenomenological Research*, 64(3), (pp. 665 – 662).

Yablo, S. (1993). "Is Conceivability a Guide to Possibility?" *Philosophy and Phenomenology Research,* 53(1), (pp. 1- 42).

Yablo, S. (2006). "No Fools Cold: Notes on Illusions of Possibility." In Garcia-Carpintero & Macia (Eds.), *Two Dimensional Semantics* (pp. 327 -346). Oxford: Oxford University Press.