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Non-Naturalism and Naturalism in Mathematics, Morality, and Epistemology

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Acknowledgements

Introduction

Consider the following propositions:

> Scientific Proposition: The universe is expanding at an increasing rate.

> Mathematical Proposition: There are infinitely many prime numbers.

> Epistemic Proposition: Belief in the principle of induction is justified.

> Moral Proposition: Murdering an innocent person for fun is wrong.

> Aesthetic Proposition: The Isle of Skye is beautiful.

> Theistic Proposition: Churches are sacred.

There are senses in which all of these propositions are true. For example, when we say "Churches are sacred", what we might mean is that churches are places in which people have what they describe as spiritual experiences, more so than in most places. If taken as such, the proposition "Churches are sacred" is almost certainly true. Conversely, one might take "Churches are sacred" to be asserting something much more. Instead of just stating facts about humans and their responses to certain environments, "Churches are sacred" could state something further that cannot be entirely expressed by facts about humans and their environments. It might be stating that churches have this transcendent property called "sacredness" that is not just a function of causal tendencies in humans. On this latter reading of "Churches are sacred", we might then think it is false. Like the proposition "Churches are sacred", the rest of the propositions have different possible readings. Does "The Isle of Skye is beautiful" state something about human psychology and how they tend to behave? Or, does it

assert that the Isle of Skye is beautiful in a deeper sense? This paper is fundamentally concerned with these types of propositions and in what senses we can say that they are true.

We can ask two fundamental questions with respect to these propositions:

(1) How do we find out whether they are true?

(2) Do these propositions merely assert that humans have certain causal tendencies?

Question (1) constitutes an epistemological question about how we come to know these propositions and question (2) constitutes a metaphysical question as to what these propositions say about the nature of reality.

Let's consider the first question. All the scientific propositions are those that are investigatable by science. Put this way, it is uninteresting to claim that "The universe is expanding at an increasing rate" is a scientific proposition. But consider this question: which of the other propositions are investigatable by science? Might it be that epistemic propositions are actually investigatable by science? Or that moral propositions are investigatable by natural science? What about mathematical propositions? This boundary of whether a proposition is investigatable by science is the boundary between the proposition as a *natural* or *non-natural* proposition. Since this distinction concerns how we can know certain facts, the natural/non-natural distinction is purely an epistemological distinction.

The second question concerns whether these propositions merely assert that humans have certain causal tendencies. For instance, on one reading, when asserting that churches are sacred, we may just be asserting that humans hold certain behavioral attitudes towards churches, in which case "Churches are sacred" merely asserts that humans have certain causal tendencies. Alternatively, on another reading, "Churches are sacred" may be asserting that churches have a transcendent property called "sacredness", meaning that "Churches are sacred" does not merely

assert that humans tend to behave in certain ways around churches. Do epistemic or moral propositions merely assert that humans have certain causal tendencies, for example a tendency to make inferences in accord with the principle of induction? Do mathematical propositions merely assert that humans have certain causal tendencies? This boundary of whether a proposition merely asserts a causal tendency in human animals is the boundary between a *response-dependent* or *response-independent* proposition. Since this distinction concerns what types of claims are being made about the nature of reality, the response-dependent/response-independent distinction is a purely metaphysical distinction.

The terms *natural* and *response-dependent* are significant notions that will discriminate between the views I shall evaluate in this paper. So, in an effort to be clear, I shall define them here and will be running with these definitions throughout the paper. Additionally, I will talk about propositions and properties interchangeably. For instance, when I talk about the property of sacredness, this is synonymous with talking about propositions of the form "X is sacred". Now let us define what it is for a fact to be natural. The definition is as follows:

> **Definition of Natural Facts**: For a fact to be *natural* is for it to be investigatable by natural science.

> **Definition of Natural Properties**: For property P to be *natural* is for it to be discoverable by natural science that some event or entity has property P.

Let's look at a few examples. "The Earth revolves around the Sun" is a *natural* fact because it is investigatable by natural science. The property of having electric charge is a *natural* property because it is discoverable by natural science that some event or entity has the property of having electric charge, entities like electrons and protons. *Non-natural* facts and properties would be the opposite. "There are infinitely many prime numbers" is one candidate for a fact that

is not investigatable by natural science, meaning it would be a *non-natural* fact. Likewise, primeness might be a *non-natural* property if it is not discoverable by natural science that some event or entity has the property of primeness.

One might wonder why I stop at the natural sciences (physics, biology, etc.) and do not include the social sciences (psychology, economics, sociology, etc.), where I could have defined a broader term "empirical science" to capture both the natural sciences and the social sciences. On the other hand, some may not want to consider sociology or other social sciences as empirical science, or may not want to group the natural sciences and the social sciences together in such a way as it might be misleading. This may be because of the lack of predictive power or excessive normative judgments in the social sciences. I will not comment on the status of social sciences as such. But, in order to be complete in my investigations, I will also define a broader notion of natural as the following:

> **Definition of Natural* Facts**: For a fact to be *natural** is for it to be investigatable by empirical science.

> **Definition of Natural* Properties**: For property P to be *natural** is for it to be discoverable by empirical science that some event or entity has property P.

As it turns out, the distinction between *natural* and *natural** will have no bearing on the arguments in this paper. Whether or not you want to consider social sciences as natural inquiry, I will claim that the arguments in this paper still stand. But, from now on, I will use the term *natural*, the one that only takes into account natural sciences but not social sciences. If my arguments work with natural science, then they will work when considering empirical science more broadly too. I will make it clear why this is the case later.

There are still controversial fields when talking about what counts as natural science. As the obvious case, mathematics presents a very difficult case as to whether mathematical claims are investigatable by natural science. Mathematics is certainly heavily utilized in almost all natural sciences, but this fact does not necessarily mean that the natural sciences investigate mathematical claims. The question of whether mathematics is empirical or not is lingering in the background here. If mathematics were primarily *a priori*, then it is very likely mathematical claims are not investigatable by natural science, but this claim itself is contentious. I will argue in later parts of this paper that mathematical claims are investigatable by natural science, meaning that mathematics should be considered part of the natural sciences; I will claim that mathematical facts are indeed natural facts.

There is the further question of what it is for a proposition to be investigatable by natural science even when we know what natural science is. Roughly speaking, for a proposition to be investigatable by natural science is for scientists to be able to perform some set of experiments, with "experiments" taken very broadly, in order to figure out whether it is true or not. This view of what it means to be "investigatable by natural science" runs into the problem of Quinean or epistemological holism, which is the view that rejects that there are unique experimental verification criteria for any given proposition. As a result, if epistemological holism is true, it becomes much more difficult to say what exactly is investigatable by natural science. This point will be involved with the question of whether mathematical facts can be considered natural. I will eventually argue that epistemological holism means that both mathematical facts and epistemic facts are natural facts; they are investigatable by natural science.

As for the response-dependent/response-independent distinction, I will define it as follows:

Definition of Response-Dependent Facts: For a fact to be *response-dependent* is for it to merely assert causal tendencies in humans, like human feelings, attitudes, and other behavioral tendencies.

Definition of Response-Dependent Properties: For property P to be *response-dependent* is for it to merely be a function of human feelings, attitudes, and other behavioral tendencies.

Paradigm response-dependent facts involve facts about human taste or sexual attraction. Paradigm response-dependent properties will be things like tasting good and looking sexually attractive. On the opposite end, it is fairly uncontroversial to claim that 1+1=2 is a response-independent fact. 1+1=2 does not assert any causal tendency in humans, but rather asserts an abstract relation between mathematical entities. Likewise, the mathematical property of primeness is taken to be a response-independent property since it is not a function of human feelings, attitudes, and other behavioral tendencies.

Many take philosophical propositions to be response-independent propositions. Response-dependent propositions should be left to the sciences. This sort of view is expressed by Bertrand Russell:

> [A philosophical proposition] must not deal specially with things on the surface of the earth, or with the solar system, or with any other portion of space and time. … A philosophical proposition must be applicable to everything that exists or may exist. (Russell 1917, 110)

Russell seems to be claiming that philosophical propositions do not deal with particular physical facts, where physical facts are particular facts about spatio-temporal entities. Since response-dependent facts are physical facts, Russell is also claiming that philosophical propositions must be response-independent. I take Sehon to be expressing a similar kind of thought when it comes to epistemology and morality:

> [Q]uestions about what justifies a particular proposition are not physical questions. I would also assume that questions about whether a given action is moral or immoral are likewise not questions within the realm of physical science. (Sehon 2016, 126)

Converting Sehon's statement to my terminology, he takes epistemic propositions and moral propositions as non-physical propositions and consequently response-independent propositions. These propositions do not merely assert causal tendencies in human animals. Some would disagree though. Some would claim that moral propositions are response-dependent propositions, which means they are no longer philosophical propositions, but are rather propositions of empirical science. Questions about whether a proposition is response-dependent are questions involving what the proposition is *about*. Physics and biology are about causal interactions between physical and biological entities, respectively. Propositions about taste (gustatory propositions) are about causal tendencies in humans with respect to consumption. Is epistemology merely about causal tendencies in humans? Is morality merely about causal tendencies in humans?

Given the two distinctions I have drawn, there are four possible views that one could hold regarding mathematical, moral, and epistemic propositions, respectively:

(1) These propositions are *non-natural* and *response-independent*. They are not investigatable by natural science and do not merely assert causal tendencies in humans.

(2) These propositions are *non-natural* and *response-dependent*. They are not investigatable by natural science and merely assert causal tendencies in humans.

(3) These propositions are *natural* and *response-independent*. They are investigatable by natural science and do not merely assert causal tendencies in humans.

(4) These propositions are *natural* and *response-dependent*. They are investigatable by natural science and merely assert causal tendencies in humans.

At the outset, view (2) is untenable for any proposition. If these propositions are response-dependent, then they merely assert causal tendencies in humans. But, causal tendencies in humans are investigatable by natural science, making these propositions natural by definition. Thus, there are only three views one could entertain with respect to these propositions:

Non-Naturalism: Mathematical, moral, and epistemic facts are *non-natural* and *response-independent*.

Vindicatory Naturalism: Mathematical, moral, and epistemic facts are *natural* and *response-independent*.

Eliminative Naturalism: Mathematical, moral, and epistemic facts are *natural* and *response-dependent*.

Of course, there are many possible combinations one could entertain. For instance, one could be a non-naturalist about mathematics but an eliminative naturalist about morality. The task of this paper is to determine whether we should be non-naturalists, vindicatory naturalists, or eliminative naturalists about mathematics, morality, and epistemology.

A good illustration of the difference between non-naturalism and vindicatory naturalism is mathematics. The non-naturalist and vindicatory naturalist agree that mathematics is not merely about causal tendencies in humans. Mathematics is about abstract mathematical objects. But, the non-naturalist thinks that we can know mathematical facts without natural science, whereas the vindicatory naturalist will claim that mathematical propositions are confirmed through natural science. In this way, mathematical propositions are investigatable by natural science, i.e. natural, for the vindicatory naturalist, but they are not investigatable by natural

science for the non-naturalist. For the non-naturalist, we come to know mathematical facts through some other means that will be largely *a priori*.

A good illustration of the difference between all three views is epistemology. The eliminative naturalist thinks epistemic propositions are merely about causal tendencies in humans, maybe stating psychological facts about how humans typically come to believe things. The non-naturalist and vindicatory naturalist would disagree. Epistemology is really about justification and evidential relations, regardless of particular causal tendencies in humans. Still, the non-naturalist disagrees with the vindicatory naturalist. The vindicatory naturalist believes that we come to know epistemic propositions through natural science, whereas the non-naturalist thinks we can know epistemic propositions without natural science.[1] The non-naturalist thinks we can come to know epistemic propositions in a largely *a priori* manner.

I will argue that we should be vindicatory naturalists with respect to mathematics and epistemology, but eliminative naturalists with respect to morality. This is a fundamentally Quinean view, which will become apparent when I present more of the details, but it will depart from some of Quine's view in certain important respects (e.g. I will argue for the existence of intentional states). These departures from Quine, I claim, make this Quinean view more plausible. If I am wrong that we should be eliminative naturalists with respect to morality, the second-best option is to become vindicatory naturalists with respect to morality, in my view. If vindicatory naturalism is not a viable option at all, then we should become non-naturalists with respect to mathematics, morality, and epistemology.

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[1] The vindicatory naturalist will also claim that we can come to know claims through common-sense theory, where common-sense theory consists of our everyday beliefs and terminology. The vindicatory naturalist will claim that we come to know epistemic principles through experience, not *a priori*. This is where the vindicatory naturalist disagrees with the non-naturalist. It will become more clear how common-sense theory relates to vindicatory naturalism in Part III.

One might wonder: why should we care? What does it matter if we are vindicatory naturalists instead of non-naturalists or eliminative naturalists? The reason is that we presumably care whether we are *realists* about such things. It is a substantial claim to say that moral facts merely assert causal tendencies in certain humans, in which case there will be no universal facts about what we ought to do morally. We can define a general realist position with respect to X-type claims (e.g. mathematical claims) as follows: (1) X-type of claims can be true or false, (2) there are some X-type of claims that are objectively true, (3) these objective facts are mind-independent, and (4) humans know at least some of these objective facts. It is clear that if propositions are response-dependent, we cannot be realists about them. These propositions would not be mind-independent. They would be entirely dependent on the behavioral tendencies of humans. This means that both non-naturalism and vindicatory naturalism are realist views, but eliminative naturalism is an anti-realist view.

This discussion is also important with respect to epistemology and how we know these propositions. The non-naturalist and vindicatory naturalist are both realists, but they disagree about how we can come to know certain propositions. The vindicatory naturalist believes we come to know propositions through theories about the world, whereas the non-naturalist might think we can come to know them through intuition. At base, the vindicatory naturalist is an empiricist and the non-naturalist is not. Of these two views, I believe that vindicatory naturalism is the better one.

As for how I will argue for these claims, the paper will break up as follows. In Part I, I will argue against non-naturalism for mathematics, morality, and epistemology. In Part II, I will argue against eliminative naturalism for epistemology. In Part III, I will argue for vindicatory

naturalism for mathematics and epistemology, but against vindicatory naturalism for morality. Lastly, I will end with some concluding remarks.

For Part I, I will make an epistemological argument against non-naturalism in general. In his book *Ethics: Inventing Right and Wrong*, J.L. Mackie challenges anyone who holds that moral propositions are true in any objective sense. In it, he writes:

> If there were objective values, then they would be entities or qualities or relations of a very strange sort, utterly different from anything else in the universe. Correspondingly, if we were aware of them, it would have to be by some special faculty of moral perception or intuition, utterly different from our ordinary ways of knowing anything else. (Mackie 1977, 38)

While Mackie means for this argument from queerness to target *any* moral realist, it very neatly frames the troubles for non-naturalism. First, if moral properties are not merely about causal tendencies in humans, but instead about some peculiar oughtness, this makes them very strange properties. They are strange in the sense that they are unlike anything else in the universe, as Mackie suggests. Second, if these properties are non-natural, we would come to know these moral properties in very different ways than most other things. Natural science will not help us in investigating moral claims. These two statements gesture at two challenges to non-naturalism: a metaphysical challenge and an epistemological challenge. In Part I, I will present an epistemological challenge that questions our ability to know non-natural mathematical, moral, and epistemic facts.

When defenders of non-natural moral facts are given this challenge, a common strategy of defense is a partner-in-crime approach, which is mentioned by Mackie (Mackie 1977, 39). These defenders argue that if this epistemological challenge works against non-natural moral facts, it also works against non-natural mathematical and epistemic facts. And, since we will not

give up non-natural mathematical and epistemic facts, we should not give up non-natural moral facts. Since I reject non-naturalism outright, this partner-in-crime approach will no longer be as attractive. The epistemological challenge in Part I, I claim, works equally for non-natural mathematical, epistemic, and moral facts.

In order to make the discussion even broader, I will also consider what it would look like to believe in non-natural aesthetic properties or a non-natural property of sacredness that a theist might believe in. The point of the comparison between non-naturalistic accounts of mathematics, morality, epistemology, aesthetics, and transcendent sacredness is to show that they all are subject to the epistemological challenge, and to emphasize that it is mysterious how we would come to know non-natural properties. The similarity between these properties is often what causes many philosophers to regard them as equal in status. For example, Quine regarded moral and aesthetic properties as "on an equal footing", where moral values merely represent our "private satisfactions" (Quine 1978, 40-41). This is to say that moral propositions just assert causal tendencies in humans; they are response-dependent propositions. Or, Kim claims that "naturalized epistemology makes no more, and no less, sense than naturalized ethics" (Kim 1988, 400). Clearly, philosophers have made use of these comparisons in the past to make their point. So the point of comparison between all of these types of propositions and properties is to take a holistic view of non-naturalism.

If my analysis in Part I is sound, then non-naturalism is an unattractive view epistemologically. This is probably what leads many to become naturalists. When they become naturalists, they often become eliminative naturalists. They claim that epistemic and moral propositions, for instance, are best construed as response-dependent propositions. Part II argues against eliminative naturalism for epistemology in particular. I will first present the eliminative

naturalist's views for epistemology and morality, noting how much of a conceptual divide there is between the eliminative naturalist's views of these subjects and the traditional views of these subjects. I will then argue that the eliminative naturalist's views about epistemology in particular either lead to global nihilism, the view that there are no objective facts whatsoever, or lead back to vindicatory naturalism, which claims that epistemic facts are response-independent.

Once these negative arguments are laid out, Part III will present and argue for vindicatory naturalism for mathematics and epistemology. I will then address some other worries with such a view, like the worry that we might have to be skeptical about intentional states. Although the vindicatory naturalist can save response-independent mathematical and epistemic facts, I will argue that we cannot save response-independent moral facts in the same way. Finally, I will address some worries about vindicatory naturalism in general.

In my concluding remarks, I will summarize and consider some broader points, ending with implications for philosophy in general if my arguments are correct.

Part I: Against Non-Naturalism

I.1 The Epistemological Challenge

Consider again the following propositions:

> Scientific Proposition: The universe is expanding at an increasing rate.

> Mathematical Proposition: There are infinitely many prime numbers.

> Epistemic Proposition: Belief in the principle of induction is justified.

> Moral Proposition: Murdering an innocent person for fun is wrong.

> Aesthetic Proposition: The Isle of Skye is beautiful.

> Theistic Proposition: Churches are sacred.

How is it that we would come to know these propositions? In the case of the proposition "The universe is expanding at an increasing rate", how we come to know this proposition is through observations of natural entities in the universe. Although, this point is more complicated than it seems if epistemological holism is true. If epistemological holism is true, then we do not directly observe that the universe is expanding at an increasing rate. Rather, this proposition would be one part of a scientific theory and the scientific theory as a whole is confirmed. This point will become more clear in the discussion of vindicatory naturalism. With these complications aside, it seems relatively straightforward how we know whether the universe is expanding at an increasing rate. There is no deep mystery here. What about the other propositions?

If these propositions are non-natural, this means that we cannot investigate these claims through natural science (by definition). A consequence of these propositions being non-natural is that the properties (e.g. moral wrongness) must be *causally inert*. The reason is fairly simple: if these properties were causally efficacious, then they would be discoverable by natural science, and hence natural. For example, the property of having electric charge is a causally efficacious property that electrons have. Since the property of having electric charge is causally efficacious, we understand electric charge through natural science. In more abstract terms, if a property is causally efficacious, then it is natural. Take the contrapositive and we get the following: if a property is non-natural, then it is causally inert. Thus, the non-naturalist must consider mathematical, moral, and epistemic properties to be causally inert. This presents an epistemological issue. If mathematical, moral, and epistemic properties are causally inert, then how could we possibly know about them? Since we cannot turn to natural science, how is it that we come to know mathematical, moral, and epistemic facts?

In his book *Taking Morality Seriously*, Enoch presents this epistemological challenge. To illustrate how the challenge is supposed to work, he lays out the following example that originated with Hartry Field to illustrate why the challenge is potent:

> Suppose that Josh has many beliefs about a distant village in Nepal. And suppose that very often his beliefs about the village are true. Indeed, a very high proportion of his beliefs about this village are true, and he believes many of the truths about this village. In other words, there is a striking correlation between Josh's beliefs about the village and the truths about the village. Such a striking correlation calls for an explanation. And in such a case there is no mystery about how such an explanation would go - we would probably look for a causal route from the Nepalese village to Josh [...]. The reason we are so confident that there is such an explanation is precisely that the striking correlation is so striking - absent some such explanation, the correlation would be just too miraculous to believe. (Enoch 2011, 158)

A similar dilemma can be applied to the types of propositions that we are concerned with. For the non-naturalist, there is a striking correlation between our beliefs and these supposed truths. For instance, the non-naturalist believes that we have mostly true beliefs about mathematical, moral, and epistemic propositions, but there is no causal contact between us and these properties. This is a striking correlation that requires an explanation. How can the non-naturalist explain this correlation between our beliefs and these truths? If we are left with this striking correlation and no explanation for it, it would rightly be considered miraculous and unbelievable (Enoch 2011, 159). This line of thought about mathematical knowledge is explicitly expressed by Field about mathematics:

> [The challenge is to] explain how our beliefs about these remote [mathematical] entities can so well reflect the facts about them. [...] [I]*f it appears in principle impossible to explain this*, then that tends to *undermine* the belief in mathematical entities, *despite* whatever reason we might have for believing in them. (Field 1989, 26)

A similar line of thought about normative claims in general is expressed by Street:

> [T]he realist must hold that an astonishing coincidence took place - claiming as a matter of sheer luck, [causal] pressures affected our evaluative attitudes in such a way that they just happened to land on or near the true normative views among all the conceptually possible ones. (Street 2008, 208-209)

The same can be expressed about aesthetics and sacredness. If the properties of beauty and sacredness are causally inert or transcendent, how is it that we have arrived at the correct beliefs about what is beautiful and what is sacred? What are the chances that we arrived at the correct beliefs by pure chance? This challenge as Field and Street present it can be thought of in terms of probability. There is an infinite range of possible mathematical, moral, epistemic, and

aesthetic beliefs that humans could have. How is it, without any causal contact with the properties and entities themselves, and without the help of natural science, that we just happened to arrive at the infinitesimally many beliefs that are true? Such a coincidence seems impossible. An explicit argument that formalizes and expands on Enoch's epistemological challenge is as follows:

<u>The Epistemological Challenge</u>

1. There is a striking correlation between our beliefs and the true mathematical, moral, and epistemic propositions according to the non-naturalist, and such a striking correlation calls for an explanation. [Striking Correlation Thesis]
2. If there is no plausible mechanism that explains the striking correlation, then there is no explanation of the striking correlation. [Explanatory and Plausible Mechanism Requirement]
3. There is no plausible mechanism that explains the striking correlation. [No Mechanism Thesis]
4. There is no explanation for the striking correlation. [2, 3]
5. If there is a striking correlation between our beliefs and the true mathematical, moral, and epistemic propositions, and we have no explanation for this striking correlation, then this lack of explanation for the striking correlation counts significantly against non-naturalism. [Conservative Conclusion]
6. The lack of explanation for the striking correlation counts significantly against non-naturalism. [1, 4, 5]

<u>Striking Correlation Thesis</u>

Starting with the first premise, The Striking Correlation Thesis is quite palatable. If the correlation between Josh's beliefs and the Nepalese village is striking in Enoch's example, then it should not be any different for the propositions in question. To put it in terms of theistic propositions, if the property of sacredness is entirely transcendent and causally inert *and* we also happen to have mostly correct beliefs about what is sacred and what is not, this would be miraculous and would require an explanation. In the same vein, it seems miraculous that we

would have mostly correct mathematical, moral, and epistemic beliefs if these propositions were about causally inert properties. Given that natural science cannot help us and causal contact with these properties is not possible, there seems to be a need for an explanation here. What is an alternative way that we come to know these propositions? This is the question that would ideally be answered by the non-naturalist.

<p style="text-align: center">Explanatory and Plausible Mechanism Requirement</p>

The Explanatory and Plausible Mechanism Requirement is quite broad. All that it calls for is a plausible mechanism that brings us to correct beliefs about certain propositions. For example, the mechanism by which I know that there is a table in front of me involves various perceptual systems and the causal contact with the properties of the table. Unfortunately, since the non-naturalist admits that their properties are causally inert, human perceptual processes that allow for causal knowledge will not help. Therefore, some other mechanism must explain how we obtain mostly correct beliefs.

A vital part of the Explanatory and Plausible Mechanism Requirement is Joshua Schechter's distinction between an *operational* question and an *etiological* question. Schechter presents operational and etiological questions as they pertain to *deductive inference*:

> **The Operational Question**: How does our cognitive mechanism for deductive inference work such that it is reliable? (Schechter 2010, 444)

> **The Etiological Question**: How is it that we have a cognitive mechanism for deductive inference that is reliable? (Schechter 2010, 444)

Converting the talk of deductive inference to the topics that we are concerned with, the operational question simply asks how it is that the cognitive mechanism for obtaining moral beliefs, for instance, is so successful. The etiological question asks how it is that humans attained

this cognitive mechanism. We can broaden this discussion to include mechanisms other than just

cognitive mechanisms. For instance, if evolution has endowed us with correct beliefs about X, in

some sense this evolutionary mechanism is not purely cognitive, insofar as evolution itself is not

a process in a human brain. Or, suppose that God merely implants in our brains correct beliefs.

This would likely not be considered a cognitive mechanism. So, let us just look for *any*

mechanism that helps explain the striking correlation. As for our discussion, we are concerned

with more than just deductive inference. The explanatory and plausibility challenges are as such:

> **The Explanatory Challenge**: What mechanism explains how
> humans obtain mathematical, moral, and epistemic beliefs that are
> largely true?

> **The Plausibility Challenge**: Is it plausible that humans have this
> mechanism?

I will argue that there is no mechanism such that this it satisfies both the explanatory and

the plausibility challenges for beliefs about non-natural mathematical, moral, epistemic,

aesthetic, and theistic propositions. For these beliefs, mechanisms that satisfy the Explanatory

Challenge do not satisfy the Plausibility Challenge and mechanisms that satisfy the Plausibility

Challenge do not satisfy the Explanatory Challenge.

Sufficiently answering both of these challenges is vital to solving the epistemological

challenge, as evidenced by the following example. Take the theistic propositions about

sacredness again. How could we possibly know what is sacred and what is not if the property of

sacredness cannot causally influence anything in the world? The theist might posit the following

mechanism: God implanted in our brains the correct beliefs about sacredness. In terms of the

Explanatory and Plausibility Challenges, this God mechanism succeeds in satisfying the

Explanatory Challenge but fails in satisfying the Plausibility Challenge. The mechanism of God

implanting correct beliefs in our brains solves the Explanatory Challenge because God would be quite a reliable mechanism for attaining true beliefs, given that He is omniscient and omnipotent. Said differently, if God existed and wanted humans to have correct beliefs about sacredness, then God implanting correct beliefs in our brains explains why we have correct beliefs about sacredness, even though the property of sacredness is causally inert.

Unfortunately, this mechanism fails the Plausibility Challenge in that we would have to grant the existence of God and that God implants these beliefs in our brains in the first place.[2] As a result, the mechanism of God implanting correct beliefs in our brains solves the Explanatory Challenge at the cost of failing the Plausibility Challenge. Even though the Explanatory Challenge was solved, the God mechanism does not succeed.

There may be a lingering concern that the Explanatory and Plausible Mechanism Requirement begs the question against causally inert properties. By requiring that a mechanism explains the striking correlation, we might be subtly sneaking in a requirement of causal efficacy. By requiring that a mechanism explain the striking correlation, we are forcing the explanation into the mold of a *causal* explanation, which is problematic if we are talking about causally inert properties. Yet, this requirement is still reasonable and does not beg the question. Specifically, we arrive at certain beliefs through causal interactions[3]; beliefs are causal entities. Consequently, since the striking correlation involves our *beliefs*, it is reasonable to require a mechanism that explains why we causally arrive at *correct beliefs*. This mechanism does not need to directly involve the causally inert properties themselves, but nonetheless, humans obtain beliefs through

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[2] I am just assuming that this account is implausible. I would have to give more arguments that would go far off topic in order to argue that this is the case.

[3] Some may deny this claim. One might claim that thinking about beliefs in terms of causes is simply the wrong approach. Under this view, beliefs would not be causal entities, strictly speaking. This is an interesting way out of my line of argument against non-naturalism. I will not assess the plausibility of this view though. My target is the non-naturalist who accepts that beliefs are indeed causal entities.

causal interactions. Even innate beliefs are arrived at through causal interactions, like the causal interactions of evolutionary history. We *need* a mechanism of some sort in order to explain how we physically arrive at the correct beliefs. Otherwise, without a mechanism, there is no reason to think that our beliefs would be causally influenced in such a way as to arrive at what is true.

To put this objection another way, the non-naturalist may claim that I am confusing justification with causality. The non-naturalist might say that when we are talking about how we know about non-natural properties, like mathematical and moral properties, it is a mistake to talk about causal interactions. We know about these properties through reasons and justifications, not through causal interactions. Of course, there will be causal interactions that underlie these reasoning processes, but one will never find a satisfactory answer as to how we come to know these things just by looking at causes, according to the non-naturalist. By forcing the non-naturalist to give a causal mechanism, we are forcing the explanation into a non-justificatory mold. In order to give an explanation of the striking correlation, we must talk about reasons, not causes, claims the non-naturalist.

This is a potent objection and I agree with the non-naturalist on this point to a certain extent. When we are discussing the truth of mathematical propositions, for instance, this is not a discussion *about* causes. Whether 1+1=2 is not *about* any particular arrangement of physical objects or causal relations between physical objects. This does not mean that causes are completely irrelevant to mathematics since causes are necessary for us to even have a discussion of mathematics. Sehon provides the following explication of why a mathematical proof is not about causes but why causes might still be relevant:

> One can raise a question about whether an alleged mathematical proof is sound. The question about soundness is not a question about the physical arrangement of bits of ink on paper, and questions of soundness do not reduce to purely physical facts about

ink. But that's not to say that the position of ink is utterly irrelevant. Had Kurt Gödel's famous 1931 paper had some extra ink marks in certain places (e.g., adding an extra negation), it would no longer have expressed a sound argument. (Sehon 2016, 134-135)

Does this really provide an objection to the Explanatory and Plausible Mechanism Requirement? It does not for the following reason: although these facts (e.g. mathematical facts) may not be *about* causes, there still remains the question of how humans have a mechanism such that they can reason about things that they do not come into causal contact with. To reiterate, it is one thing to say that mathematical facts are not about causes, but are about abstract mathematical objects, which is a *metaphysical* point. It is quite another thing to say that humans have a cognitive mechanism that allows them to reason accurately about these abstract mathematical objects, which is an *epistemological* point. These are two distinct claims. The vindicatory naturalist can coherently agree that mathematical facts are not about causes, but also require that there is a mechanism such that it is plausible that human animals can reason accurately about these abstract mathematical objects.

Conservative Conclusion

The Conservative Conclusion is what it sounds like. It does not assert that non-naturalism is implausible. Instead, the lack of an explanation of this striking correlation just counts significantly against such a view. Field suggested a stronger conclusion. For Field, if these epistemological challenges cannot be met, then we should not be non-naturalists, *no matter what other evidence that we have*. I do not claim this much. With that said, this epistemological challenge will differentiate non-naturalism from vindicatory naturalism. It is the reason that we should be vindicatory naturalists rather than non-naturalists, I claim. So while the Conservative

Conclusion is conservative in what it aims to show, I claim that it is enough to sway us towards vindicatory naturalism, but that argument has yet to come.

<div align="center">No Mechanism Thesis</div>

If the Explanatory and Plausible Mechanism Requirement is a sound requirement, then it would be ideal for the non-naturalist to posit some mechanism that meets this requirement. I will spend some time in Part I discussing possible ways to deny this premise, or possible mechanisms that can fulfill the Explanatory and Plausible Mechanism Requirement. Given the success of mathematics, we will discuss the method of proof and self-evidence as a possible mechanism for obtaining correct beliefs. Another possible mechanism is that evolution has endowed humans with correct beliefs about such things. I will first evaluate the method of proof in Section 2. Then, I will shortly evaluate evolution as a mechanism in Section 3. Then, in Section 3, I will evaluate intuition as a mechanism to know truths about causally inert objects from the angle of intuition acquisition.

<div align="center">**I.2 The Method of Proof and Self-Evidence**</div>

One method by which we claim to know mathematical truths is through proof and self-evidence. For the non-naturalist, we do not get to mathematical truths by coming into causal contact with mathematical entities or properties. Rather, we take incremental steps from certain axioms and deduce theorems from these axioms. In any given proof, one might claim that the axioms are taken to be true by self-evidence and the theorems are deduced logically from the axioms using clearly defined rules. A mathematical non-naturalist, as a result, might hold that proofs are a possible mechanism to explain the striking correlation between our beliefs and mathematical truths. Let us first look at whether this method of proof and self-evidence is available to moral and epistemic non-naturalism.

One might initially think that such proofs are not possible for morality and epistemology. Consequently, we have no analogous way of knowing about causally inert moral and epistemic properties. However, is this really true? Clarke-Doane challenges this very point:

> In the sense in which mathematicians "prove" mathematical theorems, we could equally "prove" moral theorems. What is called "proof" of a given mathematical proposition, p, is really just a *deduction* (or deduction-sketch) of p from the relevant axioms. [...] Moral propositions are open to analogous "proof". We could deem a set of moral propositions "axioms", and then show that the relevant propositions deductively follow from them. (Clarke-Doane 2014, 239)

Furthermore, to say that mathematics simply starts from basic axioms that are intuitive and builds from there is also an oversimplification. Instead, just like in morality and epistemology, we start from certain theorems that seem intuitive and try to find general axioms that systematize all of them (Clarke-Doane 2014, 240). This is the general method of *reflective equilibrium*, originating from Rawls (Rawls 1971). This method is an iterative process in which one tries to create a balance between different intuitions and principles. The question then remains: in what ways are we allowed to use the reflective equilibrium for mathematics, but not for morality or epistemology?

It seems safe to say that a larger percentage of people who understand moral and epistemic claims disagree about them when compared to mathematical claims. Does this necessarily mean that they are less self-evident? In some ways, we would *expect* there to be more disagreement about moral and epistemic claims. First, moral claims often conflict with self-interest whereas mathematical claims do not.[4] Second, social and cultural influences are much more likely to affect perceptions of moral and epistemic claims because cultures likely have

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[4] This point was raised by Scott Sehon.

norms regarding moral and epistemic claims, thereby introducing many more factors that influence whether one particular person finds a moral or epistemic claims self-evident. Thus, moral and epistemic claims often conflict with what we want and humans are highly impressionable based on their social and cultural environments, which will influence their views on morality and epistemology. Add these two facts together and it seems obvious that ideas about moral and epistemic claims are *expected* to differ. On the other hand, self-interest and social factors are much less likely to influence perceptions of mathematical claims since these statements are not as relevant to everyday life. Therefore, as Clarke-Doane puts it, "unlike moral disagreement, mathematical disagreement cannot be explained away as reflecting [these] distorting influences" (Clarke-Doane 2014, 243).

Besides moral and epistemic claims, we could also construct proof systems for aesthetic claims and theistic claims using logic. For instance, we could utilize the method of reflective equilibrium about aesthetic claims, balancing our different intuitions about what is beautiful while trying to systematize these intuitions with general principles. The same could be said for sacredness. We could employ the method of reflective equilibrium based on our intuitions about what is sacred.

In this sense, *any* domain of propositions can employ the method of reflective equilibrium. We could systematize aesthetics, sets of theistic propositions, epistemology, and morality in the same way that we systematize mathematics. We could use the method of reflective equilibrium in all of these domains of inquiry. But, even if we *can* employ the method of reflective equilibrium, this does not necessarily establish a plausible mechanism that explains the striking correlation. This brings us back to the confusion between justification and causation brought up earlier. Mathematical proofs are justificatory. They do not state the causal

circumstances under which the proof was written. To claim that the method of proof, in this way, provides a mechanism for how humans know about causally inert properties is a mistake.

Put differently, showing that a method of proof *can* be constructed for mathematical, moral, and epistemic claims does not carry much weight since we could do the *exact* same thing for *any set of propositions*. Since merely establishing that a method of proof *could* be employed is not enough to explain the striking correlation, we can go into more detail as to whether an explanation can be formulated. There is the remaining question: how does the method of proof allow us to know about abstract, causally inert entities and properties? This question no longer involves what mathematically justifies the claim 1+1=2, but instead involves how the method of proof itself accurately leads us to the correct conclusion that 1+1=2.

The non-naturalist will insist that the reason why mathematical proofs work is because they give justificatory reasons for believing in the theorems. But, when employing the method of reflective equilibrium, accepting the self-evidence of certain claims is where the rubber hits the road. If our basic intuitive judgments are false, then the whole method of reflective equilibrium is not going to be worth much. For the non-naturalist, we must rely on self-evidence and intuitive plausibility of these claims in order to assert that these proofs are sound. If these basic intuitive judgments are inaccurate, then the reflective equilibrium will never bring us to the correct ones. So, how do we know that our basic intuitive judgments, which form the bedrock of the method of reflective equilibrium, are correct?

One could make the argument that the self-evidence of mathematical, epistemic, and moral claims foists itself upon us because of human reason or intuition. This is the view which I call "intuitionism". Intuitionism can be more accurately defined as follows:

> **Intuitionism**: Humans are directly aware of the truth or falsity of
> some mathematical, moral, and epistemic claims.

This is the view that many non-naturalists hold for mathematics, morality, and epistemology. Of course, for many propositions, we are not simply aware of their truth value. I am not instantly aware of the fact that 78x54=4212. I might be instantly aware of the fact that 1+1=2 though, or that torturing children unnecessarily is morally wrong. Our intuitions constitute the mechanism by which we know mathematical, moral, and epistemic propositions for the intuitionist.

Does this constitute an *adequate* mechanism of how we know about causally inert properties? There is reason to think intuition is not an adequate mechanism. One could say the exact same thing about aesthetics and theistic propositions and it would be just as good of an answer. When an aesthetic non-naturalist is pressed about the epistemological foundations about aesthetic propositions, the aesthetic non-naturalist might again take an intuitionist stance. The defender of non-natural aesthetics might claim that we are directly aware of the truth or falsity of some propositions concerning beauty. This does not provide an explanation, but just re-describes the problem. Yes, we might have strong intuitions about the truth or falsity of some mathematical, moral, epistemic, aesthetic, and theistic propositions, but how do these intuitions happen to be correct? How is it that humans have attained largely correct intuitions about these propositions?

This point will be made more potent with an explicit example. Take an instance where the theist claims that the following principle is self-evident: every place touched by God is sacred. "Sacredness" here denotes a causally inert and transcendent property. Suppose we ask the theist the following: how is it that humans are able to perceive the self-evidence of this axiom about sacredness? Well, says the theist, there are these abilities that humans have called "threason" (theistic reason) and "thintuition" (theistic intuition). Through human threason and

thintuition, the self-evidence of the sacredness axiom foists itself upon us. Even though the property of sacredness is wholly transcendent and causally inert, humans can nonetheless threason about what is sacred. Humans have fundamentally correct thintuitions about what is sacred and can perceive the self-evidence of theistic claims about sacredness.

Despite its charm, it is quite apparent that a mechanism has not been given at all in the case of threason, thintuition, and sacredness. Rather, the problem of how our beliefs correlate with truths about sacredness has merely been pushed back to how human threason and thintuition correlate with truths about sacredness. Specifically, how can human threason and thintuition, presumably cognitive processes, see truths about sacredness when sacredness itself can never causally influence the world? This is simply the Explanatory Challenge as it applies to human threason and thintuition. The theist might have a reply that human threason and thintuition is *not* a cognitive, physical process, but rather a magical ability to perceive the transcendent realm of sacredness. Fair enough; maybe we can directly perceive these properties in this manner, but is it plausible that human beings, living organisms on planet Earth, have this magical ability? Now we run into the Plausibility Challenge. It seems that there is no solving both the Explanatory Challenge and the Plausibility Challenge for human threason and thintuition.

In the case of mathematics, morality, and epistemology, the story is no different with respect to human reason and intuition. The non-naturalist might claim that human reason and intuition show us the self-evidence of mathematical, moral, and epistemic claims. As with the human threason and thintuition case, instead of our beliefs correlating with the supposed truths of mathematics, morality, and epistemology, it is now human reason and intuition that correlates with these supposed truths. Pushing back the correlation will not help. We can ask the question: how is it that human reason and intuition, presumably cognitive and physical processes, can

access truths about mathematical objects, moral properties, and epistemic properties if these objects and properties can never causally influence the world (the Explanatory Challenge)? Instead of positing a cognitive, physical process that can be understood by scientists, it seems that one could posit that human reason can nonetheless straightforwardly perceive these transcendent realms of abstract properties and entities. This intuition mechanism comes at the cost of not being very plausible (the Plausibility Challenge). Unfortunately for the non-naturalist, there is no less magic in this story than in the the case of human threason and thintuition. The intuitionist about mathematics, morality, and epistemology has no better epistemological footing than the theist who believes in human threason and thintuition.

Despite these troubles, non-naturalists usually stick to the claim that we can have intuitive knowledge of such things. Famously, Gödel expresses such a view at least about mathematics in the following:

> But, despite their remoteness from sense-experience, we do have something like a perception of the objects of set theory, as is seen from the fact that the axioms force themselves upon us as being true. I don't see any reason why we should have less confidence in this kind of perception, i.e. in mathematical intuition, than in sense-perception. (Gödel 1984, 483-484)

This is exactly the sort of perception that seems available to the theist to perceive sacredness. We must be careful in characterizing this perception though. Taken a certain way, the assertion that we can perceive these objects is absurd. We obviously do not perceive such things in any regular sense of "perceive", like when we perceive physical objects. With that said, the very fact that non-naturalists cannot more accurately characterize this ability without talk of perception suggests that there is problematic ambiguity in what Intuitionism actually claims. Further, it would be very mysterious if this mathematical perception, for instance, were an

isolated faculty. Why would we have a faculty that is so specific to mathematics? This does not necessarily have to be the case. Parsons proposes an account of mathematical intuition in which this intuition is "not an isolated epistemological concept, to be applied only to pure mathematics", but also is to be applied in other circumstances involving intuitions about types and universals (Parsons 1980, 154-155). Since Intuitionism is the most plausible route for the non-naturalist, I will consider a more in-depth argument against Intuitionism in the next section.

I.3 Intuition Acquisition

Since it would be preferable to provide an explanation as to how and why humans have this special intuition to grasp these truths, some non-naturalists attempt to give explanations of such things. For instance, one might think that some sort of evolutionary story that develops a human capacity to reason might allow for humans to grasp abstract truths about mathematics, epistemology, and morality. In other words, mathematical, epistemological, and moral reasoning evolved in concert with other reasoning capabilities. Parfit entertains this sort of idea in the following:

> It may be true that, just as cheetahs were selected for their speed, and giraffes were selected for their long necks, human beings were selected for their rationality. That may be how we became able to reason validly, and respond to reasons. (Parfit 2011, vol. 2: 494)

A similar thought is expressed by Huemer:

> [W]hy do we have the ability to see stars? After all, our evolutionary ancestors presumably would have done just as well if they only saw things on Earth. Of course, this is a silly question. We can see the stars because we have vision, which is useful for seeing things on Earth, and once you have vision, you wind up seeing whatever is there sending light in your direction, whether it is a useful thing to see or not. Likewise, once you have intelligence, you wind up apprehending the sorts of things that can be known by reason, whether they are useful to know or not. Thus,

> humans are capable of learning to play chess at an incredibly sophisticated level, despite that the environment of Australopithecus contained no chess boards. If some evaluative truths can be known through reason, we would likely know them whether they were useful to know or not. (Huemer 2005, 216)

The claim seems to be this: once humans evolved to be rational, all sorts of propositions were suddenly available for discovery, like mathematical, moral, and epistemic propositions. Accordingly, we can know about mathematical, moral, and epistemic truths despite their abstractness because evolution has endowed humans with the proper cognitive abilities to do so, which we can call "reason".

We run into the same problem as we did when discussing the self-evidence of mathematical, moral, and epistemic claims. While evolution may have given us a general reasoning ability, it is still not clear how this reasoning ability itself can know about causally inert entities and properties. Recall the example of threason (theistic reason) and thintuition (theistic intuition). The theist could claim that humans have evolved the ability to threason about the transcendent and causally inert property of sacredness. We can ask the theist the follow-up question: how does the cognitive process of threasoning, even though it might have evolved, happen to correlate with all of the truths about transcendent sacredness? This relation between threason and transcendent sacredness is no more mysterious than that of the relation between reason and causally inert mathematical, moral, and epistemic properties. So, although evolution might explain how we might have certain cognitive processes, evolution itself cannot explain how these cognitive processes can know about causally inert entities and properties.

To put this counterargument in terms of the Explanatory Challenge and the Plausibility Challenge, the mechanism of a general reasoning capacity fails one of the challenges no matter what we take "general reasoning" to mean. First, if one takes "general reasoning" just to mean an

ability to learn new things, see patterns, and process information, then this general reasoning succeeds in being a plausible mechanism that evolution has given us, but fails to answer the Explanatory Challenge. Specifically, the ability to learn new things, see patterns, and process information does not solve the problem of how these abilities can allow us to arrive at correct beliefs about abstract, causally inert, and transcendent properties. We have simply pushed back the question from "how do our beliefs correlate with truths about causally inert properties?" to "how does our general reasoning ability cause our beliefs to correlate with truths about causally inert properties?". Similarly, the theist pushes back the question from "how do our beliefs correlate with truths about transcendent sacredness?" to "how does our general threasoning ability cause our believes to correlate with truths about transcendent sacredness?". The latter question is just as mysterious as the former.

On the other hand, one might suppose that this general reasoning capability allows humans to directly apprehend truths about mathematical, moral, and epistemic properties. While this account seemingly solves the Explanatory Challenge of how we obtain largely correct beliefs, it fails the Plausibility Challenge. Specifically, how is it that humans obtained a cognitive ability through evolution to magically apprehend truths about abstract, causally inert, and transcendent properties? How does this process *actually work*?

This very problem is taken advantage of by Street in her paper "A Darwinian Dilemma for Realist Theories of Value". At heart, Street argues that, since moral properties are causally inert, the forces of natural selection will be distorting forces on our moral intuitions (Street 2006, 121). The reason is simple: since natural selection is a causal process, and we have no reason to believe that this causal process correlates with moral truths, natural selection very likely distorts our moral intuitions. Street expresses this much in the following analogy:

On this view, allowing our evaluative judgements to be shaped by evolutionary influences is analogous to setting out for Bermuda and letting the course of your boat be determined by the wind and tides: just as the push of the wind and tides on your boat has nothing to do with where you want to go, so the historical push of natural selection on the content of our evaluative judgements has nothing to do with evaluative truth. (Street 2006, 121)

This has been the main idea that I have been pushing this section. Why would we have reason to believe that causal processes have led us to mathematical, epistemic, or moral truths if these properties are causally inert? If Street is right, then our non-naturalistic mathematical, moral, and epistemic intuitions are undermined *provided that they are largely derivative of evolution*. One obvious way to get out of this argument is to deny that evolution has anything to do with our mathematical, moral, and epistemic reasoning processes. This seems like a very plausible way to go. Is evolution really at work when mathematicians discover new theorems? Is it at work when moral philosophers debate a moral principle? It is indeed an empirical question as to how much of our mathematical, moral, and epistemic intuitions are truly derivative from evolution, meaning this claim awaits the investigations of evolutionary biologists.

I claim that the whole evolutionary approach that Street and many others take is insightful, but incomplete. Evolution is but one part of the picture; it is a limiting case of a much broader point. Many of our intuitions are not purely evolutionary. For instance, strong cultural influences can give us intuitions that we might not otherwise have had. In the case that cultural influences determine our intuitions, these evolutionary debunking arguments ("EDAs") no longer apply. If culture influences morality more than evolution, this undermines these EDAs. But, I claim that cultural influences will not bring us to truths about causally inert properties either. How can I make this argument? I can take a Quinean approach to such a question. Quine

was a strong proponent of considering how language acquisition actually happens with toddlers[5]. This would lead to fruitful discoveries involving the relationship between language and reality. We can take a similar approach, not by considering language acquisition, but rather considering *intuition acquisition*. How is it that humans acquire intuitions? When is it that humans acquire intuitions?

It seems plausible to suggest that toddlers probably do not have mathematical, moral, and epistemic intuitions, especially when these toddlers do not have linguistic and syntactic tools at their fingertips. In the case that toddlers do not have these intuitions, they must acquire them somehow. There are seemingly only two ways that toddlers could acquire new intuitions: (1) through some new cognitive capability or (2) through sense experience.

Neither way of developing intuitions seems to suggest that human intuitions would be correct about causally inert properties. First, if humans develop intuitions through some new cognitive capacity, there is no reason to think that this cognitive capacity correlates with truths about abstract properties. Second, if humans develop intuitions through sense experience, there is no reason to think that sense experience would tell us anything about causally inert properties. In neither case do we have reason to think that our intuitions bring us to mathematical, moral, and epistemic knowledge. A formalized version of this argument is as follows:

<div align="center">Intuition Acquisition Argument</div>

1. If humans acquire intuitions about causally inert entities, it is through a new cognitive ability, through new sense experiences, or some combination of the two. [Possible Acquisitions Premise]
2. Humans acquire intuitions about causally inert entities. [Intuition Acquisition Premise]
3. Humans acquire intuitions about causally inert entities through a new cognitive ability, through new sense experiences, or some combination of the two. [1, 2]

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[5] For instance, Quine uses this strategy in *Word and Object*.

4. There is no reason to think that any combination of new cognitive abilities or sense experiences would lead to correct intuitions about causally inert entities. [No Combination Premise]
5. If humans acquire intuitions about causally inert entities through X and there is no reason to think that X would lead to correct intuitions about causally inert entities, then there is no reason to think these intuitions are correct. [Skeptical Conclusion]
6. There is no reason to think that intuitions about causally inert entities are correct. [3, 4, 5]

I want to again contrast this argument with some of the other types of debunking arguments made in the literature. In *The Evolution of Morality*, Joyce accepts that an EDA does not need to hypothesize that moral beliefs are innate in order to work (Joyce 2006, 180). Joyce still maintains that, at the bare minimum, moral concepts are innate and generated by evolution (Joyce 2006, 181). Since we are talking exclusively about non-naturalistic conceptions of mathematics, morality, and epistemology, this is already unnecessarily going too far.[6] We do not need to talk about evolution at all in order to undermine the non-naturalist's intuitions. All that is required is that humans acquire intuitions. Let us evaluate each of these premises in turn.

Possible Acquisitions Premise and Intuition Acquisition Premise

In naturalistic terms, there does not seem to be any way to acquire an intuition other than through some combination of new cognitive abilities or new sense experiences. There is still the lingering possibility that humans are not entirely naturalistic creatures. I have in mind here that humans are some combination of naturalistic entities and supernatural entities, like that of a soul. Or, it is possible that God allows human to acquire intuitions. These are logically possible ways of acquiring intuitions.

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[6] Since Joyce wants to establish skepticism more generally for morality, he is considering more than just non-naturalist views of morality. This may be the reason he is forced to talk about evolution.

I will exclude supernatural vocabulary from the rest of this section. Assuming that supernatural entities, including God, are implausible, these are implausible ways of acquiring intuitions. Once supernatural entities are discounted as possibilities, it is hard to imagine how humans could acquire intuitions in any other way other than through cognitive abilities and sense experience.

Note that I am including very early stages of human development in this discussion. Presumably humans do not have intuitions when they are rudimentary fetuses. Even at this stage, if humans acquire intuitions, it must be through some cognitive capacity, sense experience, or some combination of the two. New cognitive abilities include evolutionary developments. For instance, the development of vision as a sensory apparatus is entirely evolutionary. The development of vision, under my meaning of "cognitive ability", is a new cognitive ability. Therefore, all acquisitions through evolution or culture or anything else will be captured by some combination of cognitive abilities and sense experience. Since I am including very early stages of human development, the Intuition Acquisition Premise must be true, disregarding any supernatural entities.

It is not clear whether the non-naturalist thinks that these intuitions are acquired through exclusively cognitive abilities or not. This is part of the puzzle of Intuitionism. By and large, I take the non-naturalist to be supposing that perceiving mathematical, moral, and epistemic truths is primarily a cognitive ability. While it is required that a human have *some* sense experience to properly utilize this cognitive ability, it is really the cognitive ability that drives us to the truth.

The Possible Acquisitions Premise becomes more potent if we try to hypothesize when humans actually acquire mathematical, moral, and epistemic intuitions. It is clear that even toddlers have innate beliefs, like a belief in induction. Essentially, toddlers are induction

machines. They are overwhelmed with sensory information and must make inductive inferences about past sensory experience for the future. Consider the fact that, before sense experience, toddlers do not know the sensory apparatus that humans primarily use for communication. For instance, it could have been the case that humans decided to communicate primarily through sign language instead of auditory stimuli, in which case toddlers would have to recognize that the main communication method is through physical motions, not through voices. How can they possibly accomplish this? They implicitly make inductive inferences based on sense experience.

At what point do humans acquire these intuitions then? It depends whether we take intuitions to be conscious or unconscious. If intuitions can be unconscious, then toddlers likely have intuitions like that of induction. If intuitions cannot be unconscious, then toddlers certainly cannot acquire intuitions until a certain level of linguistic and syntactic complexity is achieved. For a toddler to have an intuition that 1+1=2, it seems plausible to suggest that the toddler must be able to conceptualize these symbols. It is an interesting question as to whether human can have a conscious intuition that 1+1=2 *without* explicitly representing this intuition in terms of numerals like "1" and "2". But, why would numerals be required to have an intuition about causally inert entities? It is odd for the non-naturalist that we need symbols in order to have these intuitions. This relationship between symbols and intuition needs to be explained by the non-naturalist. Regardless of the answer to that question, under any meaning of intuition, mathematical intuition is acquired through some combination of cognitive capabilities and sense experiences.

This question is even more interesting for morality and epistemology. At what point can a toddler have a moral intuition? It again depends on what we mean when we claim that the toddler has this intuition. If this entails an awareness of certain propositions, then toddlers cannot

acquire intuitions until they achieve a certain level of linguistic complexity. Moreover, even when toddlers acquire an adequate amount of linguistic complexity, it seems likely that toddlers need to acquire something more than just linguistic complexity in order to have moral intuitions. It is colloquially understood that young children do not understand what is right or wrong at a young age. They must develop something else in order to develop moral sensibility. This could be achieved through inductive inferences involving observed social rules or through some sort of emotional development. The inductive inferences involving observed social rules roughly fall in the category of a new sense experiences and emotional development roughly falls in the category of a new cognitive ability. On the face of it, why would emotional development or social rules help the child acquire intuitions about the causally inert property of moral wrongness?

Similar statements apply to epistemology. It seems more likely that toddlers have basic epistemic tendencies in common, as is the case with induction. Once again, the timing of intuition acquisition depends on what we mean by a human having an intuition. Linguistic abilities do seem central. Like with mathematics and morality, this means that toddlers can only have epistemic intuitions after the point at which they acquire these linguistic tools. Here the vindicatory naturalist will want to say that the toddler empirically confirms the principle of induction because the toddler is able to form a rudimentary common-sense theory about the world, one in which induction is central and allows the toddler to make correct predictions and understandings about the world. This point will be addressed in more detail in Part III.

All of these questions should be left to scientists, but it illustrates the point that cognitive capabilities and sense experiences are central to every human capability, including having mathematical, moral, and epistemic intuitions. We acquire intuitions just as we acquire anything else. It would be quite a radical suggestion to claim that these intuitions are somehow special in

how we acquire them, especially because such a statement seems to be an empirical statement of psychology. As far as the Possible Acquisitions Premise goes, it seems overwhelmingly plausible.

<div align="center">No Combination Premise</div>

The No Combination Premise seems the most contentious. The No Combination Premise is really a spectrum of premises. The extremes of this spectrum are as follows:

> **Sense Experience Premise**: There is no reason to think that new sense experiences would lead to correct intuitions about causally inert entities.

> **Cognitive Ability Premise**: There is no reason to think that new cognitive abilities would lead to correct intuitions about causally inert entities.

Let us evaluate the extremes first. For the Sense Experience Premise, the reason why it seems very plausible is that we are considering causally inert entities. Why would any sense experience help in achieving correct intuitions about causally inert objects? The non-naturalist will likely be willing to accept this premise. If it were the case that sense experiences were responsible for our intuitions, then this would make mathematics, morality, and epistemology thoroughly empirical, something that the non-naturalist would not want to concede.

It is this premise that the vindicatory naturalist would deny in order to make it possible for humans to acquire correct mathematical and epistemological intuitions. For the vindicatory naturalist, there *are* certain sense experiences that will give us reason to believe in our intuitions about causally inert objects. For example, if certain mathematical propositions are indispensable to a certain scientific theory, and that scientific theory is confirmed through certain sense experiences, then we do have reason to believe in those mathematical propositions. Or, if certain mathematical propositions are indispensable to our common-sense theory about the world and

allow us to make successful predictions, then empirical confirmations of common-sense theory give us reason to believe in our original intuitions. What gives us reason to believe in these intuitions is sense experience combined with theoretical structures, according to the vindicatory naturalist.

As for the Cognitive Ability Premise, this is the more attractive option for the non-naturalist to reject. There might be some cognitive ability that allows humans to ascertain truths about causally inert objects. This presents its own problem that I have alluded to earlier in this section. How is it that a cognitive process, presumably a physical process, would lead humans to correct intuitions about causally inert objects? This situation is characterized well by Street's Bermuda example. Relying on certain cognitive processes that bring us to certain intuitions about causally inert objects is like setting sail for Bermuda and letting the wind and the tides take you. What reason is there to think that your cognitive processes are the right ones? And, if you change intuitions, which sometimes happens, what makes one cognitive process more likely to lead to correct intuitions than another? The difficulty is that we are considering cognitive processes in human animals. The suggestion that human animals have stumbled upon a cognitive recipe to unlock truths about such things is a tough pill to swallow.

There is nothing fundamentally new about the Intuition Acquisition Argument that has not been stated in Part I, meaning the non-naturalist may just dig in her heels here. Yet, even though I have not stated anything fundamentally new, I claim that this argument makes the non-naturalist's position even more unpalatable. The reason is this: the Intuition Acquisition Argument stresses the importance that we are human animals. All of our capabilities need to be realistically accounted for. This includes intuition acquisition. There need to be realistic accounts

of how humans develop mathematical, moral, and epistemic intuitions through empirical science.[7]

Thinking about the problem in these terms suggests that something is wrong in the non-naturalist's approach. People develop intuitions in different ways and at different times. Intuitions can change and are malleable. Intuitions often conflict. Intuitions can be wrong. Intuition development likely involves complex linguistic and syntactic capabilities. In a word, intuitions are perfectly *ordinary*. There is nothing about them that suggests they have special status that gives us insight into truths about causally inert objects. To accept all of this and then to suggest that human animals have intuitions that happen to be correct about causally inert objects is to suggest something that is, at the very least, highly contestable.

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[7]As previously mentioned, one might simply claim that looking for a causal path to beliefs is mistaken, in which case this hunt for intuition acquisition is mistaken. This is a way out of this argument, but it might come at other costs. For the non-naturalists that accept that beliefs are entirely causal entities, intuition acquisition presents a pressing problem, I claim.

Part II: Against Eliminative Naturalism

II.1 Conceptual Discontinuity

After seeing the epistemological mysteries of non-naturalism, naturalism seems like an attractive alternative. Naturalism seemingly avoids the epistemological mysteries. If these propositions are natural propositions, then we come to know them just like any other natural proposition, through natural science. There are two ways that one could be a naturalist about these propositions. The vindicatory naturalist believes epistemic propositions are response-independent, for instance. The eliminative naturalist disagrees. The eliminative naturalist believes epistemic propositions really just assert causal tendencies in human animals.

We will largely avoid mathematics in this discussion. Nobody would argue that mathematical propositions merely assert causal tendencies in humans. Yet, there are still those that are deflationary about mathematics; these are mathematical formalists and nominalists, who believe that mathematical objects do not exist at all. I will not explore these views in detail, but they will implicitly feature in Part III in my discussion of mathematics and vindicatory naturalism. The mathematical nominalist will be arguing against the vindicatory naturalist's claim that we should be ontologically committed to mathematical objects because of their role in scientific theory. For the rest of Part II, I will be concerned with eliminative naturalism as it pertains to epistemology and morality.

It is important to distinguish two types of eliminative naturalism. There are two possibilities in terms of reducibility when it comes to moral and epistemic facts: either (1) they are irreducible to *other* natural facts (non-reductionism) or (2) they are reducible to other natural facts (reductionism). For non-reductionism, moral and epistemic facts assert causal relations that are not reducible to other causal facts, like physical or biological facts. What does this really

mean? This means that, in causal explanations of certain events, moral and epistemic properties are indispensable to these causal explanations. This the sort of view held by Sturgeon and Cornell realists with respect to morality.[8] Conversely, the reductionist believes moral and epistemic facts are reducible to other causal facts, like psychological, biological, and physical facts. Under reductionism, moral and epistemic properties are dispensable to causal explanations in the sense that these moral and epistemic properties can be replaced by more basic properties, like psychological properties.

For the rest of this section, I will only be considering reductionism. This certainly does injustice to non-reductionism as a view, but the reason that I do not consider this view is as follows. Non-reductionism claims that moral and epistemic properties are indispensable to causal explanations. The property of having electric charge is an example of one that is actually indispensable to certain causal explanations within scientific practice. The difference between moral and epistemic properties and electric charge is that moral and epistemic properties are nowhere to be found in actual scientific discourse. If these properties were truly indispensable to causal explanations and irreducible to other natural properties, why are they completely absent in natural science? Of course, I am not considering all of the nuances of this view as well as what defenders would say to this objection. Much more would need to be said in order to thoroughly reject this view. Nonetheless, I will ignore this view for the rest of this section in the interest of time, running with the assumption that the absence of these properties in science is a decisive blow for the view.

It is important to note that I am not claiming that moral and epistemic properties are dispensable to scientific theory at large. I am merely claiming that moral and epistemic

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[8] Sturgeon's classic response to Harman involves the example of Hitler's moral depravity, and how this moral depravity is part of an explanation of why Hitler was depraved (Sturgeon 1998, 203).

properties do not feature at all in *causal* explanations in the actual discourse of natural science. I will claim that epistemic propositions are indeed indispensable to scientific theories, even though they do not factor into causal explanations in particular. This is a very different claim than the suggestion that epistemic properties are themselves causally operative in nature.

Moving towards reductionism, the reductionist would not expect moral and epistemic properties to factor into causal explanations in natural science. Since these properties properly reduce to other natural properties, such as psychological properties for instance, only these psychological properties will factor into causal explanations, which they do. The reductionist does not have the same problems as the non-reductionist. From now on, I will use the term "eliminative naturalist" to characterize reductionists, but not non-reductionists.

What would an eliminative naturalist's view look like? In his seminal paper "Epistemology Naturalized", Quine defends an eliminative naturalist position for epistemology. In it, he famously argues that the old epistemology should be abandoned for the new. He states the following:

> [E]pistemology still goes on, though in a new setting and a clarified status. Epistemology, or something like it, simply falls into place as a chapter of psychology and hence of natural science. It studies a natural phenomenon, viz., a physical human subject. (Quine 1969, 82)

Quine is of the opinion that we would be better served by a scientific study of human cognition than normative epistemology (Kim 1988, 391). Instead of spinning our wheels quarreling over what is justified in an *a priori* manner, we can settle for how in fact humans form beliefs through empirical psychology. One might have the objection that we could not arrive at any facts about empirical psychology without doing epistemology first. However, one must be careful not to make the mistake of assuming epistemology must deduce science from first

principles in a foundational manner. The failure of this foundational approach is largely what motivates a naturalized epistemology in the first place. Further, Quine's view is not that simplistic. He acknowledges that natural science cannot contain epistemology outright. Instead, there is a "reciprocal" containment, one where natural science and epistemology contain each other in different senses (Quine 1969, 83). Whether this reciprocal containment ultimately makes sense is a further question.

Kornblith describes Quine's suggestion that we should settle for psychology as a *strong replacement thesis* (Kornblith 1994, 4-7). The strong replacement thesis is that epistemological questions can be substituted for psychological questions and that this must happen (Kornblith 1994, 7). The *weak replacement thesis*, as Kornblith describes it, holds that psychology and epistemology are both ways of achieving answers to the same questions (Kornblith 1994, 7). Another way that Kornblith describes this view is by considering the following questions (Kornblith 1994, 1):

(1) What should we believe?

(2) How do we in fact arrive at certain beliefs?

The first question is taken to be a question of normative epistemology. The second question is taken to be a question of empirical psychology. The *weak replacement thesis* claims that we can investigate the first question by investigating the second question. We can do normative epistemology by doing empirical psychology, but doing normative epistemology is itself still viable. The strong replacement thesis claims that we should dispense with the first question and settle for the second question. This seems to be Quine's view in "Epistemology Naturalized".

What is the problem with such a view? It is widely regarded as being eliminativist about normativity, hence the name "eliminative naturalism". It is important to note that Quine himself has said that he did not think normativity could be dispensed with entirely. When he claims that we should just settle for psychology instead of doing old-fashioned epistemology though, it seems that his view *is* eliminative about the normative. In "Epistemology Naturalized", Quine is reducing epistemic claims, like claims about justification, to psychological claims about how humans come to believe things. All we need are these psychological claims, nothing more.

Considering a specific eliminative naturalist account will be illustrative. In his book *Knowledge and Its Place in Nature*, Hilary Kornblith outlines a particular strategy that is often taken by reductive naturalists, a strategy in which what counts as being justified or what counts as knowledge is conditional on particular desires or goals (Kornblith 2002, 146). This kind of view is embodied by Quine in another context, as he expresses in the following:

> Naturalization of epistemology does not jettison the normative and settle for the indiscriminate description of ongoing procedures. For me normative epistemology is a branch of engineering. It is the technology of truth-seeking, or, in a more cautiously epistemological term, prediction [...] There is no question here of ultimate value, as in morals; it is a matter of efficacy for an ulterior end, truth or prediction. The normative here, as elsewhere in engineering, becomes descriptive when the terminal parameter is expressed. (Quine 1986, 664-665)

To Quine, once it is acknowledged that the goal of epistemology is to find the truth or to predict, then epistemology becomes an empirical enterprise. It is seemingly an empirical question as to what methods will bring humans closer to the truth or prediction, and will have a purely descriptive answer. This embodies an eliminative naturalist account of epistemology. What is justified will be reducible to descriptive properties. Unfortunately, as Kornblith points out, this sort of naturalized epistemology is not universal. Which beliefs are justified will depend on what

goals your particular batch of epistemology entertains. The goal of epistemology could be fundamentally truth-seeking, but it could also be biological fitness (Kornblith 2002, 148). The goal could even be to serve God, in which case this might allow for spiritual revelation as a robust source for justified beliefs. Therefore, what is justified or what counts as knowledge for anyone will be conditional on what goals that person accepts for their epistemology. This ties back to the response-dependent/response-independent distinction. Since the particular desires and behavioral attitudes of humans dictate their epistemology, epistemology becomes response-dependent. There is no Justification with a capital "J"; there is just justification-for-you, justification-for-me, and so on based on individual goals and tendencies.

One might think that this is not so much of a problem since, as a matter of fact, the epistemologies of most people have the goal of seeking the truth. This claim itself is contentious, but let us grant it for now. For the few that consider their epistemology to be directed towards something else other than truth, they are not wrong to do so. They simply have a different but equally good epistemological enterprise. One instance of this might be that revelation is a reliable method to justified belief, and there is nothing wrong with this. Notably, there might be right answers *within* any given epistemological framework once the goals are set, but if there are disagreements about goals, there is nothing further to be said. We must simply agree to disagree. There are no right answers about what is *really* justified outside of any particular epistemological enterprise.

There are similar eliminative naturalist views in morality as well. Explicitly, what is morally good or bad will be conditional on the goals of the moral endeavor. Quine also advocates this sort of view for morality:

> Causal reduction can serve not only in thus condensing the assumptions but also in sorting out conflicts. Thus take the

question of white lies. If we once agree to regard truthfulness as good only as a means to higher moral ends, rather than as an ultimate end in itself, then the question becomes a question essentially of science, or engineering. (Quine 1978, 44)

Quine's statement exemplifies the eliminativist naturalist's position. Instead of including anything normative, Quine suggests a "causal reduction". This is to say that moral claims are really about causal tendencies in humans. For Quine, once we figure out what our moral ends are, which will be an empirical question, we will know the best action to take when it comes to white lies, which will also be an empirical question. This amounts to accepting different moral frameworks based on different goals. For instance, the goal might be to reduce moral evil, where moral evil is identical to suffering. Once the goal of the moral enterprise is found, which itself is an empirical question based on human tendencies, it becomes an empirical endeavor to figure out how we best achieve that goal. There is no correct goal for a moral endeavor, just what goal certain humans happen to want. When there is disagreement that this is the goal of morality, there is no real answer. We are simply asserting that we each have different goals for our moral endeavor, which is to assert particular descriptive facts about ourselves. We again must agree to disagree.

What is an actual objection to this view? The most common objection involves a claim about conceptual discontinuity. The objector would claim that the epistemology and morality that Quine is advocating for are no longer epistemology and morality as we know them, but something entirely different. There is conceptual discontinuity insofar as the eliminative naturalist dispenses with any robust form of normativity (Kornblith 2002, 18). Kornblith would be willing to accept at least some conceptual discontinuity. Just as we have in the past dispensed of concepts of folk chemistry when we do chemistry, we might have to dispense of certain conceptions of normative epistemology (Kornblith 2002, 19).

This discontinuity does not sit as well for others. Kim expresses concern for the eliminative naturalist's approach:

> When we talk of "evidence" in an epistemological sense we are talking about justification: one thing is "evidence" for another just in case the first tends to enhance the reasonableness or justification of the second. And such evidential relations hold in part because of the "contents" of the items involved, not merely because of the causal or nomological connections between them. A strictly nonnormative concept of evidence is not our concept of evidence; it is something that we do not understand. (Kim 1988, 390-391)

Kim is expressing concern about the fact that the eliminative naturalist believes that epistemology is about "causal or nomological connections". The eliminative naturalist is looking for causal tendencies in humans, or "patterns of law-like dependencies characterizing the input-output relations for this particular organism and others of a like physical structure" (Kim 1988, 390). These are merely particular causal, physical facts that vary across species. These facts do not concern, in any obvious sense, notions of evidence and justification as they relate to theories. Plainly put, this is no longer epistemology. Or, as Kim puts it, "for epistemology to go out of the business of justification is for it to go out of business" (Kim 1988, 391). Once we are concerned purely with causal tendencies in humans, we are no longer doing epistemology, making it difficult to see how the eliminative naturalist's "epistemology" is a replacement of traditional epistemology (Kim 1988, 391).

The eliminative naturalist position about morality creates a similar conceptual discontinuity. Instead of investigating what humans ought to do, the eliminative naturalist settles for investigating what in fact humans happen to care about and what measures humans can take to preserve what they care about. Similarly, the claim of conceptual discontinuity is the claim that the eliminative naturalist's replacement of morality is not morality at all.

Conceptual discontinuity is taken as an objection to the eliminitive naturalist's view with both epistemology and morality. It is a rather potent objection if we require that epistemology and morality are about the same things that they used to be. Traditional epistemology is about evidence and justification, morality about what we ought to do. Neither are merely about causal tendencies in humans.

As a final point that will lead to the next session, the eliminative naturalist's views about epistemology and morality are *anti-realist* views. The eliminative naturalist believes that epistemic and moral claims are mind-dependent insofar as they are dependent on human goals and tendencies. These claims are not objective in the sense that they universally apply to every rational agent. This anti-realist view, at least for epistemology, leads to extreme consequences.

II.2 Epistemic Anti-Realism and Global Nihilism

The objection of conceptual discontinuity may not amount to much for some naturalists. They take this objection in stride in the same way that there are other conceptual discontinuities between common-sense theory and scientific theory. At least for epistemic anti-realism, there are more severe consequences than just conceptual discontinuity. Accepting epistemic anti-realism may amount to accepting that there are simply no objective facts at all, including scientific facts.

By itself, epistemic anti-realism of the eliminative naturalist sort is not unimaginable. It could be that we are just mistaken that there are objectively true statements about evidential and justificatory relations. How this anti-realism affects other domains of knowledge makes it so extreme. Once we become anti-realists about evidential and justificatory relations, it becomes difficult to see how we can establish objective facts at all. The landslide into global nihilism, the view that there are no objective facts at all, would befall us if anti-realism about normative evidence and justification were true. The only seeming way to stop this landslide into global

nihilism is to create a sharp separation between normative, epistemological statements and descriptive, scientific statements.

In his *The Collapse of the Fact/Value Dichotomy*, Hilary Putnam challenges this very view, the view that descriptive facts are completely separable from normative facts. Putnam claims that "theory selection always presupposes values" (Putnam 2002, 31). Examples of these values in scientific theory include norms such as coherence, plausibility, reasonableness, and simplicity (Putnam 2002, 31). To take a specific example, in choosing the theory of evolution, or any other scientific theory for that matter, we are presupposing epistemic values that discriminate between the theory of evolution and other theories, like say Young Earth creationism (YEC). How do we decide between the theory of evolution and YEC? Since none of us were alive 10,000 years ago, none of us can check whether the universe was around before then. There are radioactive materials or very old photons that *suggest* that the universe is older, but these could have been created by God in order to make us think the universe was older. God may have wanted us to *believe* that the universe is 13.7 billion years old and that humans came from apes, but this might nonetheless be false. In this scenario, God would have made the universe look exactly how it would have looked if the universe was actually 13.7 billion years old and evolution had taken place, but nonetheless God made Adam and Eve in the Garden of Eden just as the Bible professes. What real reason do we have to accept one of these theories rather than the other?

The deep issue with deciding between the theory of evolution and YEC without robust epistemic norms is this: without presupposing epistemic values, there are no criteria to decide what counts as evidence for one theory rather than another. If we take the eliminative naturalist's view of epistemology, it might be true that given an epistemology that is truth-seeking and

assuming additional criteria like simplicity and induction, the theory of evolution is preferable to YEC. However, the theory of evolution is only preferable to YEC given these particular explicit goals of epistemology and assumed epistemic principles. For the eliminative naturalist, there is no problem with someone adopting the goal of serving God for their epistemology, thereby having different epistemic principles. In which case, it might be true that one should believe God created the world in 7 days, given different epistemological goals and epistemic principles. Furthermore, this theist is *equally as justified* in believing YEC because the goal of his epistemology and the epistemic principles that go with it are simply different. Neither Quine nor the theist is right *or* wrong in thinking that they are justified in their beliefs. Rather, they are right relative to their epistemological framework based on their personal goals.

This is how epistemic anti-realism amounts to global nihilism. Since there are no objective facts about epistemic norms, there are also no objective facts at all because epistemic norms guide us as to which propositions are true and which are not. Without epistemic norms, we do not know what counts as evidence for any particular theory. This is considerably worse than brain-in-a-vat type scenarios. At least in brain-in-a-vat type scenarios, you would have knowledge or justified beliefs about the external world if only there were an external world. With this type of global nihilism, there is no objective justification and knowledge *at all*.

There is a confusing issue with this view that needs to be resolved. For the eliminative naturalist, to accept a particular epistemological enterprise is really to accept the following two claims: (1) I have goal X and (2) goal X is best achieved by the following set of actions S. For instance, Quine seems to suggest his epistemological enterprise is as follows: (1) Quine has the goal of prediction for his epistemology and (2) the goal of prediction is best achieved by the following set of actions S. A theist, on the other hand, might have the following epistemological

enterprise: (1) the theist has the goal of serving God for her epistemology and (2) the goal of serving God is best achieved by the following set of actions S.

In both the case of the theist and Quine, they must know both of these facts in order to even begin to do epistemology. This presents the following problem: isn't it necessary to have some meta-epistemology to decide whether you have a certain goal for your epistemology and what would best achieve that goal? For the theist, is it not necessary for her to have some meta-epistemic principles to decide whether she really has the goal of serving God and whether the set of actions S best achieves the goal of serving God? Similarly, for Quine, is it not necessary to have some meta-epistemic principles to decide that his goal really is prediction and that the set of actions S best achieves the goal of prediction? It seems that in both cases, if there are no meta-epistemic principles, then neither Quine nor the theist can decide what their epistemology should be. If there are meta-epistemic principles, then it seems that we are back to traditional normative epistemology. What are these meta-epistemic principles such that we can know what goal we have for epistemology and how to best achieve those goals?

This dilemma for the eliminative naturalist about epistemology can be stated in a slightly different way. The eliminative naturalist believes that epistemic facts are really just about human tendencies. In order to establish humans have causal tendencies of any kind, there needs to be *some* form of existing epistemology to determine which causal tendencies obtain. This does not have to take the form of foundationalist epistemology, but there nonetheless must be some way to discriminate between two competing theories about what causal tendencies obtain. We are back to the original problems of normative epistemology. What meta-epistemic principles should Quine and the theist accept such that they can accurately determine what causal tendencies

related to epistemic practices obtain among human animals? Without these meta-epistemic principles, there is no telling how Quine and the theist's epistemologies would function.

The underlying point in these examples is that no matter what goal your epistemology has, it must have truth as part of its goal. Kornblith argues for exactly this point (Kornblith 2002, 158). Pragmatically speaking, we all have the goal of truth embedded in our epistemologies. This seems the most reasonable route for the eliminative naturalist to take. Otherwise, nobody's epistemology can get off the ground.

The question for Kornblith then becomes this: in what sense is he disagreeing with the non-naturalist and the vindicatory naturalist anymore? In what sense is Kornblith's view of epistemology not the epistemology that philosophers have been laboring over for centuries? Once Kornblith accepts that truth is a goal of epistemology, truth cannot be completely captured by causal tendencies in human animals. Kornblith recognizes this fact:

> In a word, philosophical talk of knowledge is not merely descriptive; it is prescriptive. And prescriptive categories need not answer to anything that actually exists in the world at all. The categories in which we couch our normative theories—our view of what the world ought to be like—need not be held hostage to any description of the actual causal structure of the world. (Kornblith 2002, 159-160)

Given this statement, Kornblith seems to accept that epistemology is not just about causal relations, but something more. There is indeed a place for normative epistemology. Kornblith is not a non-naturalist though, which means he is best characterized as a vindicatory naturalist. In other writings, Quine also seems to slip back into talk of normative epistemology. Consider the following:

> Within this baffling tangle of relations between our sensory stimulation and our scientific theory of the world, there is a segment that we can gratefully separate out and clarify without

pursuing neurology, psychology, psycho-linguistics, genetics, or history. It is the part where theory is tested by prediction. It is the relation of evidential support. (Quine 1990, 1)

Quine says what the vindicatory naturalist would say about epistemology here. As Foley points out, this sounds like we are back to traditional *a priori* epistemology (Foley 1994, 250). Yet, even though these epistemic facts about evidential relations are not psychological or neurological facts, they are still not *a priori* (Foley 1994, 250). Both the vindicatory naturalist and Quine still agree that principles involving evidential support (i.e. epistemic principles) are empirically tested through scientific theory. It seems that our paradigm cases of eliminative naturalism (e.g. Kornblith and Quine) have slid back into talk of the normative and not just about causal tendencies in human animals, making them vindicatory naturalists instead of eliminative naturalists.

The only alternative for the eliminative naturalist is to deny that there is any place for evidential relations and justification; there is only place for human psychology and how we in fact arrive at beliefs. This view is the one that will lead to global nihilism. There is no theory selection at all if there are simply no right and wrong evidential relations. There is no way to establish any facts about the world at all, let alone human psychology.

Part III: For Vindicatory Naturalism

III.1 The View

The view of vindicatory naturalism is fundamentally a Quinean view. This view is Quinean insofar as it accepts two doctrines: a Quinean sort of naturalism and epistemological holism. As for the Quinean sort of naturalism, it is a view that rejects philosophy as having a distinct claim to ontological questions and defers ontological judgments to natural science. More broadly, Quinean naturalism rejects that philosophy has a distinct claim on *any* sort of questions; philosophy is continuous with science. As Quine himself puts it, his view of naturalism is as follows:

> … naturalism: abandonment of the goal of a first philosophy. It sees natural science as an inquiry into reality, fallible and corrigible but not answerable to any supra-scientific tribunal, and not in need of any justification beyond observation and the hypothetico-deductive method. … The naturalistic philosopher begins his reasoning within the inherited world theory as a going concern. He tentatively believes all of it, but believes also that some unidentified portions are wrong. He tries to improve, clarify, and understand the system from within. He is the busy sailor adrift on Neurath's boat. (Quine 1981a, 72)

In this way, natural science need not concern itself with philosophy as a purely *a priori* enterprise. Scientific claims can only be refuted by science, not for philosophical reasons. Natural science is also the only way to study ontology, or to figure out what exists. An ontological question in this view is not distinctly a philosophical question, but rather a question "on a par with questions of natural science" (Quine 1953, 45). To be clear, philosophers can criticize scientific claims, but they must do so on scientific grounds, not philosophical grounds (Maddy 1992, 276). This means that belief in unicorns is not a philosophical mistake, but actually a scientific mistake. Quine makes this point very clearly in the following:

Physical objects are conceptually imported into the situation as convenient intermediaries - not by definition in terms of experience, but simply as irreducible posits comparable, epistemologically, to the gods of Homer. Let me interject that for my part I do, qua lay physicist, believe in physical objects and not in Homer's gods; and I consider it a scientific error to believe otherwise. (Quine 1953, 44)

This view is divergent from most of the history of philosophy. So why hold such a view? The motivation is simply that first philosophy has failed and is misguided. The reason why philosophers have been laboring over the same questions for centuries is because they have not been working close enough to scientific theory, or common-sense theory for that matter. The way in which we confirm our hypotheses about the world is through theory-making that ultimately ties back to experience. This is where epistemological holism comes in.

Epistemological holism is the claim that individual propositions cannot be confirmed or refuted by experiment; only theories as systems of propositions can be confirmed or refuted by experiment. As Quine puts it, "our statements about the external world face the tribunal of sense experience not individually but only as a corporate body" (Quine 1953, 41). Quine explains this view in more detail:

The totality of our so-called knowledge or beliefs, from the most casual matters of geography and history to the profoundest laws of atomic physics or even of pure mathematics and logic, is a man-made fabric which impinges on experience only along the edges. … A conflict with experience at the periphery occasions readjustments in the interior of the field. Truth values have to be redistributed over some of our statements. Re-evaluation of some statements entails re-evaluation of others, because of their logical interconnections - the logical laws being in turn simply certain further statements of the system, certain further elements of the field. … No particular experiences are linked with any particular statements in the interior of the field, except indirectly through

considerations of equilibrium affecting the field as a whole. (Quine 1953, 42-43)

To give Quine's explanation a more concrete example, take the widely rejected claim that the Earth is flat. Are there any experiments that could confirm the proposition "The Earth is round" on its own? According to epistemological holism, the answer is no. The reason is as follows. Say we want to confirm that the Earth is round. We try to confirm it by performing an experiment, which we decide will be to send an explorer in one direction to see if they end up back in the same place. Lo and behold the explorer travels West with a plane and eventually ends up back in the same place. The Flat-Earther retorts with an explanation of this fact. The Flat-Earther claims, "The only reason why the explorer ended up in the same place is because there are transporters at the edges of the Earth that instantaneously transport anyone to the other side. So if you reach the West edge of the Earth, it will instantaneously transport anyone to the East edge of the Earth. That is why the explorer ended up in the same place."

Now we must test to see whether there are transporters at the edge of the Earth. We ask the Flat-Earther what exactly these transporters are. The Flat-Earther claims that they are actually wormholes in spacetime. We do another experiment and find that there are actually no gravitational anomalies anywhere on Earth that would suggest there are wormholes. The Flat-Earther responds, "The only reason why we do not detect the gravitational anomalies is because these wormholes do not exhibit gravitational effects when they are on the edges of the Earth." We would then ask the Flat-Earther to explain why wormholes act differently on the edges of the Earth and how else we could detect them. This process would iterate and iterate until eventually we will get the entire statement of the Flat-Earther's theory. And we can only compare the Flat-

Earther's theory to our theory. There is no meaningful way to compare individual statements of our theory to the Flat-Earther's theory.

This is the sort of process Quine is discussing when he talks of re-evaluation of some statements rather than others. When scientists confront an experiment that seemingly is in conflict with a scientific theory, it is not obvious which parts of the theory should be revised or whether there should even be revisions at all. The scientists might reject the experiment as having faulty data through some malfunction. Or, on the opposite end of the spectrum, the scientists might consider the experiment to be a valid counterexample to the previously accepted law of nature, and revise the law of nature as a result. Even logical laws can be revised under this view since logical laws are simply one of many propositions in the theory. These logical laws are more so on the "interior", as Quine describes it, but this is just to say that they are the propositions that are the most indirectly related to experience. Quine's metaphor for this view is the "web of belief", where propositions near the edge of the web are the ones most directly related to experiences and the propositions near the center of the web are the most indirectly related to experience, but all of them ultimately tie back to experience. Logical laws will be at the center of the web and statements like "the universe is expanding at an increasing rate" will be closer to the edge of the web. The web consists of the logical interconnections between all of our beliefs or parts of a theory, where some parts are more directly related to experience than another.

With epistemological holism comes interesting consequences. Since entire theories are tested by experiment instead of individual statements of theories, theories are either confirmed or refuted by experiment. Consequently, there is no meaningful way of claiming that an experiment confirms certain parts of a theory and not others, which means that all the parts of the theory are

confirmed when they are confirmed by experiment. Since all the parts of a theory get confirmed when a theory is confirmed, this confirmation might extend to mathematical propositions. Quine recognized the consequence:

> Ordinary interpreted scientific discourse is as irredeemably committed to abstract objects - to nations, species, numbers, functions, sets - as it is to apples and other bodies. All these things figure as values of the variables in our overall system of the world. The numbers and functions contribute just as genuinely to physical theory as do hypothetical particles. (Quine 1981b, 149-150)

If epistemological holism is true, then Quine's next conclusion is fairly easy to see. If scientific theories posit species, quarks, numbers, and sets, then it stands to reason that we should accept the existence of numbers and sets if we accept the existence of species and quarks. There seems no reason that we should accept ontological commitment to all of the other posits of scientific theory but arbitrarily stop our ontological commitment when it comes to the mathematical posits. Putnam also put forward the classic indispensability argument in his *Philosophy of Logic*, where he states:

> [Q]uantification over mathematical entities is indispensable for science, both formal and physical; therefore we should accept such quantification; but this commits us to accepting the existence of the mathematical objects in question. (Putnam 1971, 57)

This argument for mathematical objects and the truth of mathematical propositions has been widely discussed in the philosophical community. These types of arguments are called "indispensability arguments". As they pertain to mathematical objects and mathematical propositions, they can be formalized as such:

Indispensability Argument - Entities and Properties

1. We have reason to believe in an entity or property if and only if that entity or property is indispensable to our best scientific theories. [Quinean Thesis]
2. Mathematical objects are indispensable to our best scientific theories. [Indispensability Thesis]
3. We have reason to believe in mathematical objects. [1, 2]

Indispensability Argument - Propositions

1. We have reason to believe a proposition if and only if that proposition is indispensable to our best scientific theories. [Quinean Thesis]
2. Certain mathematical propositions are indispensable to our best scientific theories. [Indispensability Thesis]
3. We have reason to believe in certain mathematical propositions. [1, 2]

How do the two doctrines that we originally discussed factor into this argument? Quinean naturalism tells us that only natural science can make judgments about ontological questions, which gives us half of the biconditional in the Quinean Thesis. Quinean naturalism tells us that we have reason to believe in a particular entity or property *only* if it is indispensable to our best scientific theories. Quinean naturalism on its own does not get us the Quinean Thesis. It could be that we should reserve all of our ontological commitments to entities that are indispensable to scientific theories, but that not all entities that are indispensable to our best scientific theories are worthy of ontological commitment. This is where epistemological holism comes into play. If epistemological holism is true, then individual statements within theories are not confirmed on their own. Instead, theories as wholes are confirmed. This means that whenever a theory is confirmed, every statement within the theory also enjoys confirmation. Put differently, we have reason to believe in a particular entity or property if it is indispensable to our best scientific theories. Putting Quinean naturalism and epistemological holism together, we get the Quinean

thesis: we have reason to believe in entity E or property P if and only if it is indispensable to our best scientific theories.

Notably, we only need epistemological holism to make the Indispensability Argument work. We only need the following: if an entity or property is indispensable to our best scientific theories, then we have reason to believe in that entity or property. Quinean naturalism is less relevant when it comes to the Indispensability Argument for mathematics, but it becomes more relevant in our broader discussion of whether to accept moral properties into our ontology, for instance. If Quinean naturalism were true, and it were the case that moral properties are dispensable to scientific theory, then we do not have reason to believe in moral properties. In terms of propositions, we would not have reason to believe in moral propositions, as long as these moral propositions do not feature in scientific theory.

Another important note is that this argument does not hinge on whether we are talking about natural science or empirical science more broadly. Recall that I defined the terms natural and natural* in order to accommodate the objection that I should be including more than just the natural sciences in the discussion. Physics is part of both natural science and empirical science, since empirical science is just the natural sciences plus the social sciences, and it is physics that we mostly have in mind for indispensability and mathematics. So the question as to whether we are talking about natural science or empirical science is irrelevant.

<u>Indispensability Thesis</u>

Denying the Indispensability Thesis is one way of rejecting the Indispensability Argument. To deny the Indispensability Thesis is to deny that mathematical entities or mathematical propositions are indispensable to our best scientific theories. Our physical theories currently quantify over mathematical objects, meaning the project to deny this premise would be

to reconstruct these theories so that they have the same physical consequences without quantifying over mathematical objects (Baker 2001, 88). On the face of it, this is a fairly wild claim. What would physics be without mathematics? Nonetheless, Field infamously undertakes this project in his book *Science Without Numbers* and attempts to re-state Newtonian physics without mathematics (Field 2016).[9] If Field were successful in this project, he will have shown that at least some of physical theory can be restated without mathematics. Mathematics is not dispensable to at least these parts of physical theory. There remains the question of whether mathematics is dispensable to more complicated parts of physical theory, like general relativity or quantum mechanics. Of course, I will not attempt to show that mathematics is indispensable to these theories. I consider it an open and an empirical question as to whether mathematics is indispensable to these other physical theories.

There are other ways to argue against Field's project. Baker makes the argument that mathematics is not only used to state the *current* form of a physical theory. Mathematics is also used to create new theories and discover new results (Baker 2001, 87). It is not as if physicists arrive at new theories and after the fact try to state these theories mathematically. In the very formulation of a new theory, the physicist is using mathematics. What this suggests is that mathematics is not only important to current formulations of physical theories, like Newtonian physics, but that mathematics is also indispensable as a way to create new theories and predict new results. For instance, Baker gives the example of Chandresekhar's proof that any star greater than 1.4 times the mass of the Sun will eventually collapse into a neutron star, according to general relativity (Baker 2001, 91). This is an example of mathematics being used not to state the current form of a theory, but to discover new results based on the current theory.

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[9] Field undertakes this project in the later chapters of his book, which are highly technical.

The relationship between physics and mathematics historically is also not a one-way street. Mathematical discoveries lead to new physical theories and physicists create mathematical innovations in order to make new scientific theories. Fourier analysis is an example of physics informing mathematics (Baker 2001, 92). In the other direction, group theory as applied to particle physics allowed for the prediction of previously unobserved particles (Baker 2001, 92). These examples suggest a much more complicated relationship between physics and mathematics, which makes it difficult to take a *current* theory and claim that it can be reconstructed without mathematics. This reconstruction misses a lot of how mathematics functions in science. Baker clearly explains this claim:

> This contribution of mathematics to the development of science over time is ignored in the indispensability debate since attention is focused on a temporal cross-section of science. This time-slice of current science is examined, and nominalistic alternatives to it are suggested. But though these alternatives may mimic the 'static' features of current theories, they will not necessarily preserve those features which are crucial to the on-going development of science. (Baker 2001, 92)

Science is not merely a grouping of current theories, but rather a process. To say that mathematics only helps with current formulations and not the process of science is a mistake, according to Baker. As this pertains to Field's reconstructive project, it is not enough to show that mathematics is indispensable to our best physical theories, even if current theories can be reconstructed without mathematics. Field would also need to show that mathematics can be replaced as a way of creating new theories and predicting new results, which is a much more difficult project to say the least, if the project were not difficult enough as it is.

Baker's argument does not fundamentally change the reconstructionist project to replace mathematics in science. It is still an empirical and an open question as to whether mathematics

can be replaced in science, both in terms of stating current theories and formulating new theories. With that said, if Baker is right, then we can be much more confident that the Indispensability Thesis is fairly stable, at least for now. The prevalence of mathematics in physics and its usefulness in creating new theories seems to be enough to accept this premise for the time being.

<div align="center">Quinean Thesis</div>

The Quinean Thesis is where most dig in their heels to reject the Indispensability Argument. I will not be concerned with the Quinean naturalism part of the Quinean Thesis here since it is less relevant for this part of the discussion. We will consider Quinean naturalism later. The only way left to reject this argument is to reject the following conditional: if an entity or property is indispensable to our best scientific theories, then we have reason to believe in that entity or property. There are many objections to this premise. For some, indispensability is actually a problem and shows that we should not be ontologically committed to mathematical objects. Musgrave makes this claim in the following:

> Imagine that all the evidence that induces scientists to believe (tentatively) in electrons turned out differently.... Popperians think this might happen to any of the theoretical posits of science. But can we imagine natural numbers going the way of phlogiston, can we imagine evidence piling up to the effect that there are no natural numbers? This must be possible, if the indispensability argument [for numbers] is right and natural numbers are a theoretical posit in the same epistemological boat as electrons. But surely, if natural numbers do exist, they exist of necessity, in all possible worlds. If so, no empirical evidence concerning the nature of the actual world can tell against them. If so, no empirical evidence can tell in favour of them either. The indispensability argument for natural numbers is mistaken. (Musgrave 1986, 90-91)

The thrust of Musgrave's point seems to be that electrons are actually dispensable to science in the sense that we could come across experiments that cause us to eliminate them from

scientific theory. The further suggestion is that the same does not apply for natural numbers. Musgrave claims that we cannot imagine getting evidence that would cause us to get rid of the natural numbers, meaning they are completely indispensable to scientific theory, regardless of the empirical evidence.

This objection utilizes two notions of indispensability as well as giving great weight to our imagination. There are two senses of "indispensability": one in which electrons are indispensable to our best scientific theories and one in which they are not. The sense of "indispensability" in which electrons are indispensable is the sense that eliminating electrons from our current scientific theory would change the theory in a way in which the theory would be worse off by certain epistemic standards. Call this notion *indispensability*. The second notion of "indispensability" is the notion that there is no possible empirical evidence that would cause us to eliminate electrons from our best scientific theory. Call this notion *indispensability**.

It is widely accepted that electrons are both *indispensable* and *dispensable**; it is true both that eliminating electrons from our current scientific theories would make them worse theories and that there is possible empirical evidence that would cause us to eliminate electrons from our scientific theories. Musgrave's next claim is that natural numbers are both *indispensable* and *indispensable**; Musgrave claims that eliminating natural numbers from our current scientific theories would make them worse theories and that there is no possible empirical evidence that would cause us to eliminate natural numbers from our scientific theories. This is bad for the Indispensability Argument because the vindicatory naturalist wants natural numbers to operate like any other theoretical posit, like electrons. But if natural numbers are indispensable*, then this suggests that they are not actually like other theoretical posits.

Why does Musgrave believe natural numbers are *indispensable**? It is because we cannot *imagine* empirical evidence that would cause us to eliminate natural numbers from our best scientific theories, which leads Musgrave to conclude that there is no possible empirical evidence that would cause us to eliminate natural numbers. Our imaginations cannot be trusted in this case, I claim. The reason why it is much more imaginable that we arrive at empirical evidence that causes us to eliminate electrons is because electrons are posits that are less central in our web of belief, to put it in Quinean terms. It would take *a lot* of empirical evidence for us to eliminate natural numbers from our scientific theories, so much so that we cannot really imagine what this empirical evidence would look like.

This does not mean that there is no such possible evidence. We can more easily imagine eliminating a particular biological protein from our scientific theories than eliminating the gene. This is because the gene is more central to our web of belief and is more central to biological theories. This does not mean that we should not be committed to the gene's existence; the gene is still *dispensable**. There is possible empirical evidence, albeit a lot of evidence, that would cause us to get rid of the gene from our scientific theories. It is difficult to imagine what the evidence would be at this point, but this does not weaken the claim that there is such possible empirical evidence. The case of natural numbers is just a more extreme case. It would take even more empirical evidence for us to get rid of natural numbers from our best scientific theories, and we may not be able to imagine such evidence, but this does not mean that there is no such possible empirical evidence. Natural numbers, like the gene and electrons, are *indispensable*, but also *dispensable**.

Some of the most prominent objections to indispensability arguments for mathematics come from Penelope Maddy. There are two major objections that Maddy makes: (1) historically

scientific practice has not exhibited this view that we should be committed to all parts of scientific theory and (2) this view does injustice to how mathematics is actually done. First, as a matter of historical fact, there have been theories that have been well-confirmed, but scientists nevertheless do not hold certain parts of the theory to be true. Maddy's example of such a case is atomic theory, which was a well-confirmed theory as early as the 1860s, but parts of it were not accepted because these parts did not admit direct verification (Maddy 1992, 280-281). These scientists were skeptical of the atom even though atomic theory had been well-confirmed. There are three possibilities for this case: (1) the atom was indispensable to the theory and the scientists were justified in being skeptical, (2) the atom was indispensable to the theory and the scientists were not justified in being skeptical, and (3) the atom was dispensable to the theory.

We can assume that (3) is false because otherwise the skeptical scientists would have been able to formulate the theory without atoms. (1) is the troubling possibility for the vindicatory naturalist. This would be a concrete case in which a scientific theory was well-confirmed, but scientists were justified in their skepticism of indispensable elements of that theory. Yet, it does not seem like that much of a bullet to bite for the vindicatory naturalist to claim that these scientists were wrong to be skeptical. They should have accepted the existence of the atom when the theory was confirmed.

In addition, there is a distinction to be made between scientific theories themselves and science as a social institution. It may be the case that the vindicatory naturalist is correct in accepting ontological commitment to all entities indispensable to scientific theory. It may also be the case that the best way for science to operate as a social institution is conservatively, only accepting commitments after a reasonable amount of empirical confirmation. Since it is the job of science as a social institution to be skeptical of existing and successful theories, it is not

surprising that there are cases in which a new theory justifies new ontological commitments but scientists are not hasty to accept them.

The second objection involves the methods of mathematical practice. The view of the vindicatory naturalist seems to do injustice to the practice of mathematicians. Proving a new theorem in mathematics is not akin to discovering anything, according to the vindicatory naturalist. It is only when this new theorem is applied to scientific theory and is indispensable to scientific theory that we accept it as a discovery. This seems bizarre. If this were really the case, then mathematicians should be keeping a close eye on developments in physics to see what mathematical theorems are *actually* true (Maddy 1992, 289). Furthermore, Maddy challenges whether certain mathematical fields, such as set theory, are affected at all by outcomes in physics (Maddy 1992, 289). Mathematical methodology on its own is not given proper respect by the vindicatory naturalist according to Maddy.

This is a very potent objection. It seems like we really should trust mathematical methodology in itself apart from science. But, in the end, the vindicatory naturalist disagrees with Maddy that mathematical methodology on its own warrants ontological commitment and justification. The reason why mathematical methodology is respected in its own right is because it has accrued that respect through scientific confirmation (Colyvan 1998, 55). Since mathematics has been overwhelmingly useful to scientific theory, this gives mathematical methodology independence that it wouldn't otherwise have. For instance, if it were the case that mathematics was not useful at all for scientific theory, currently or in the past, then our opinions of mathematics would likely be very different. If mathematics were purely a recreational activity with no applicability to science, we would likely not regard it in the same way as we do now.

Because mathematics is overwhelmingly useful and enjoys scientific confirmation in many fields, this is what lends legitimacy to mathematical methodology. This is not to say that the vindicatory naturalist should accept unapplied mathematical theorems as true. This is the specific question as to whether we should accept mathematical results before they have been applied to scientific theories. The vindicatory naturalist will answer no. The same answer applies to theoretical physics. Theoretical physicists often tinker with physical theories in the same way that mathematicians tinker with mathematical theories, but these theoretical physicists do not make any ontological commitments until the new theory has been confirmed by experiment. The theoretical physicist will always defer to experiment in the end, regardless of how theoretically compelling a theory is. While tinkering with the mathematics may be a useful way of arriving at new predictions and new theories, empirical confirmation is still the arbiter of truth for the theoretical physicist. Likewise, the mathematicians should obviously keep doing what they are doing, just as the theoretical physicists should keep doing what they are doing. Mathematicians should freely use mathematical methodology. This does not mean the vindicatory naturalist accepts what theoretical physicists and mathematicians posit without experimental verification.

There is the further question of how specific confirmation is for mathematical claims in scientific theory. For instance, if the equation 345+23=368 never shows up in scientific theory, do we not know that it is true? Or, to take another example, do we not know whether there is a highest prime number even though scientific theory has nothing to say about it? If this is the case, this would almost certainly be a *reductio* of vindicatory naturalism for mathematics. Tentatively, I claim that it is not specific statements of arithmetic that must be indispensable to scientific theory. Rather, larger mathematical structures are confirmed by scientific theory. For instance, if number-theoretic structures are indispensable to natural science more broadly, then

all of the logical consequences of those number-theoretic structures are confirmed. In other words, even if 345+23=368 does not specifically feature in scientific theory at all, the fact that number-theoretic structures are indispensable is enough to confirm 345+23=368, since 345+23=368 is a logical consequence of these number-theoretic structures. The statement that there is no highest prime number would also be a logical consequence of these number-theoretic structures.

This point will heavily rely on two questions: (1) what specific mathematical structures are indispensable to natural science? (2) How are these mathematical structures related to other mathematical structures and what are their logical consequences? I am not equipped to give definitive answers to these questions. If it so happens that vindicatory naturalism for mathematics means that we cannot accept basic arithmetical statements, then we should reject the view. With that said, I will be operating with the assumption that vindicatory naturalism for mathematics does not have this implausible consequence, since it is more plausible that larger mathematical structures like certain number-theoretic models are confirmed by science.

Maddy seems committed to the claim that we should respect mathematical methodology, regardless of whether mathematics is currently or ever was useful in scientific theories. The vindicatory naturalist denies this claim. Unless mathematical posits factor into scientific theories, there is no way for them to get empirically confirmed. Their only confirmation in that case is against our own intuitions, which falls back to the epistemological challenge to the non-naturalist. How is it that our intuitions have knowledge of causally inert mathematical objects? What can reasonably explain our intuitive knowledge of such things? These are the questions that vindicatory naturalist is trying to avoid by deferring to natural science.

It seems that the Indispensability Argument might be formidable enough to survive the objections from Maddy. What is attractive about this indispensability argument is that it works for so many things that we think we should be ontologically committed to. It works for electrons. It works for proteins. It works for genes. It works for all the scientific entities that we are familiar with. This argument just goes a little farther and claims that more than just the causal entities of the theory are confirmed when the theory is confirmed. The mathematical parts of the theory are confirmed as well. Quine further suggests that even logical laws are subject to revision and confirmation through scientific theory, like that of the law of the excluded middle (Quine 1953, 43). These logical laws are some of the most fundamental laws that we hold to be true, meaning it would take even more evidence to unhinge them than for mathematical theorems, but this does not mean that they are theoretically unrevisable. It just so happens that we will almost certainly never come across enough empirical evidence to abandon them. An indispensability argument can consequently be made for logical laws in the same fashion.

Even the most mild non-naturalist might cringe at the suggestion that we confirm logical laws empirically through scientific theory. Nonetheless, the vindicatory naturalist is able to account for how we can know mathematical propositions and logical laws without supposing any strange intuition faculty. This initial backlash to the empirical confirmation of logical laws can also be explained by the vindicatory naturalist. These logical laws are so central to our web of belief and so indirectly confirmed by experience that logical laws *seem* like they are the best candidates for full-blown *a priori* knowledge. Yet, if the Indispensability Argument works for mathematics, it is not much different to accept the Indispensability Argument for logic. I suspect that if someone rejects the Indispensability Argument for one, then she will reject the

Indispensability Argument for the other. Said differently, if you accept the Indispensability Argument for mathematics, there seems no reason not to accept it for logic, and vice versa.

There are two reasons why philosophers might balk at the suggestion that scientific theories alone tell us what is true: (1) the Indispensability Argument has no explanation of mathematical intuition and (2) the Indispensability Argument completely disregards common-sense as a way to know things, which is absurd. Let us first evaluate the objection from mathematical intuition first.

Parsons argues this very point that the Quinean has no good account for mathematical intuition (Parsons 1980, 151). What makes sense of our mathematical intuitions if mathematics is, at its core, empirical? The vindicatory naturalist does not want to deny that we do have largely correct mathematical intuitions, but this is true of many other types of intuitions. Humans have pre-scientific intuitions about causation and these intuitions are often correct within certain error bars. We are largely correct when it comes to everyday intuitions about causation. We all have intuitions about what physical objects to consume in order to gain nourishment, for instance. This does not mean that these intuitions are not part of a larger theoretical framework and are not, at base, empirically justified. In fact, the reason why we have such good intuitions about mathematics is because it has been so useful in common-sense theory, which takes us to the second objection.

What about the disregard for common sense? Don't we have reason to believe in things in our everyday lives? At this point, the question arises: exactly what sort of theories are we talking about when we say "scientific theories"? Are we just talking about strictly scientific theories like physical and biological theories, or theories more generally in terms of the totality

of human knowledge? With Quine, the vindicatory naturalist regards natural science as an extension of common sense. Quine expresses this view like so:

> Objects at the atomic level and beyond are posited to make the laws of macro-scopic objects, and ultimately the laws of experience, simpler and more manageable; and we need not expect or demand full definition of atomic and subatomic entities in terms of macroscopic ones, any more than definition of macroscopic things in terms of sense data. Science is a continuation of common sense, and it continues the common-sense expedient of swelling ontology to simplify theory. (Quine 1953, 44-45)

We can then consider what we should say about common-sense theory, where common-sense theory refers to our everyday beliefs, predictions, and ontological commitments. Common-sense theory is the theory that we are all utilizing and have been utilizing since a very young age. To Quine and the vindicatory naturalist, common-sense theory is not different in kind with respect to scientific theory. In the same way that there is a web of belief for scientific theory, there is also a web of belief for common-sense theory. This common-sense theory is confirmed and revised in the same way that scientific theories are: with experience. The only difference is that science is much more methodical in its approach. With the advent of natural science, much of our common-sense theory and its ontological commitments have been eclipsed by scientific theories with its commitments to electrons, genes, stars, and the like.

This does not mean that humans did not have any good ontological commitments or justified beliefs before the advent of scientific theory. One example of this is logic. Even before there were robust scientific theories, logic was central to our common-sense theory of the world. And, since our common-sense theory was able to predict outcomes and enjoy its own rudimentary forms of confirmation, logic enjoyed confirmation even before rigorous scientific

theories were around. The same could be said for mathematics. Common experiences indirectly confirm arithmetical propositions like 1+1=2.

This might be part of the reason why it is hard to believe that mathematics and logic are only legitimized through science. If common-sense theory is allowed as a pre-scientific theory, this explains the feeling that mathematics and logic had legitimate standing even before science. Mathematics and logic have stood the test of all of our theories about the world, common-sense and scientific, which justifies our level of confidence in both of them. This fact also explains why we have good mathematical intuitions. It is because mathematics has been so successful in common-sense theory for so long that we might confuse them with full-fledged *a priori* knowledge.

Common-sense theory more generally mitigates the objection to the vindicatory naturalist for being overtly scientistic. For instance, take the Quinean Thesis with respect to propositions: it states that we have reason to believe a proposition if and only if that proposition is indispensable to our best scientific theories. This Quinean Thesis is much too dramatic. Of course we have reason to believe propositions that are not exclusively statements of physics or biology. Most of the propositions that we have reason to believe are part of our common-sense theory, not scientific theory. Just as with our ontological commitments, science has eclipsed common-sense theory in many areas, meaning we have most reason to believe in the propositions indispensable to scientific theory as compared to common-sense theory. When scientific theory and common-sense theory coincide on any given issue, there is obviously no problem. We have reason to believe what they both say. When scientific theory and common-sense theory disagree, we accept what science says. Scientific theories are more predictive of experience in these cases. In cases where natural science has nothing to say, like particular facts about my own life, what we

have most reason to believe is what common-sense theory says, since there are really no competing theories. Common-sense theory has been our generator of ontological commitment and justification for as long as humans have been around. It was not until science became more mature that there were better theories of the world.

Shifting gears to what other sorts of propositions we can justify with this indispensability approach, the same analysis will apply for most of our epistemic principles. This is the point at which the vindicatory naturalist departs from the views that Quine expresses in his "Epistemology Naturalized". Instead of becoming an eliminative naturalist about epistemic principles, we can use the same indispensability approach to become vindicatory naturalists about epistemic principles. There are several epistemic principles that are indispensable to our best scientific theories. For instance, epistemic principles such as induction, simplicity, consistency, explanatory power, and inference to the best explanation are all active epistemic principles in scientific theories. Again, it is an empirical claim that these particular epistemic principles are indispensable to scientific theories, and this could be subject to change in the future, but many of these principles seem unlikely to be dispensed of.

It is hard to imagine what science would be like without induction and simplicity. The whole idea of making a prediction based on past experience is based on induction; since prediction is central to what makes science so compelling, it would be hard to imagine giving up this principle. Simplicity factors into even the most basic scientific tasks. When fitting a line to a set of data points, there are infinitely many ways to do so. How can scientists discern which line is the correct one if there are infinitely many lines given the empirical evidence? Scientists employ simplicity, absent more data. The simplest line is the correct line until further data is presented. One might think this problem eventually go away given enough data. Unless one has

infinite data points though, there will always be infinitely many ways to fit a curve. Accordingly, simplicity is almost always at play in science as an epistemic principle, even at as basic a level as fitting a curve.

Common-sense theory again comes into play with epistemic principles. Before there were scientific theories, people still implicitly believed many of these epistemic principles, like induction and simplicity. There are even more epistemic principles that are almost always employed by common-sense theory, like some sort of senses principle, which would state that we are justified in believing that our senses are largely reliable. These principles allow common-sense theory to operate and make predictions of everyday events. Even elementary things such as predicting that the floor below me will remain stable as I walk upon it are instances of successful prediction and confirmation. Insofar as common-sense theory allowed us to accurately predict and understand the world, these epistemic principles were confirmed.

As it is true that mathematics and logic have been at the center of common-sense theory and scientific theories for as long as we have known, it is also true that many of these epistemic principles have been at the center of both common-sense theory and scientific theories. In both cases, what we have reason to believe in common-sense theory and scientific theory largely has coincided so far, at least when it comes to mathematics, logic, and epistemic principles. It is only the propositions more directly related to experience (e.g. there are electrons) that have created disparities between common-sense theory and scientific theory. In these situations, we revise common-sense theory, even though it will not be as detailed as scientific theory.

One significant thing to notice is that the subject of mathematics and epistemology have not changed. Mathematics and epistemology still involve abstract mathematical objects and genuine normative principles, respectively. The vindicatory naturalist preserves the subject

matter of mathematics and epistemology. Unlike eliminative naturalism, epistemology does not become hostage to psychology, or any other causal tendencies for that matter. Epistemology is still legitimately about justification, normativity, and evidential relations. What statements justify other statements? What sorts of evidence justifies belief that *p*? These questions are independent on the causal tendencies of humans in the same way that mathematics is independent of the causal tendencies of humans.

Fundamentally, the vindicatory naturalist is an empiricist in the sense that empirical data are needed to confirm any proposition. We come to know mathematical propositions and epistemic principles empirically through the confirmation of scientific theories and common-sense theory. There are worries about what such an empiricist view leads to in other areas, as Quine had some other radical views due to his empiricism. One of the most extreme parts of Quine's views concerns intentional states and meaning.

III.2 Meaning and Intentional States

Some of the biggest worries with this sort of view might have nothing to do with mathematics, logic, or epistemic principles. They might rather concern the analytic-synthetic distinction and Quine's behaviorist views. I have in mind here Quine's radical indeterminacy of translation and skepticism about mental entities such as beliefs and meaning. Since the vindicatory naturalist takes a strictly Quinean view, one might worry that the vindicatory naturalist would have to follow Quine in being a behaviorist, accepting radical indeterminacy of translation, and rejecting the analytic-synthetic distinction. Quine did not have to go this far. I will argue in this section that, even if one accepts Quinean naturalism and epistemological holism, one can still retain an analytic-synthetic distinction, determinacy of translation, and intentional states such as beliefs and meanings.

I will start with Quine's indeterminacy of translation and will build from there. Quine's argument for the indeterminacy of translation begins with a thought experiment involving a previously unencountered group of language speakers. In this thought experiment, Quine imagines how a linguist might construct a translation of these people that I shall call "natives". One of the fundamental intuitions that drives the idea of indeterminacy of translation is exemplified by the following claim that he presents at the beginning of the chapter:

> Two men could be just alike in all their dispositions to verbal behavior under all possible sensory stimulations, and yet the meanings or ideas expressed in their identically triggered and identically sounded utterances could diverge radically, for the two men, in a wide range of cases. (Quine 1960, 26)

The claim is this: the observable behavior by two speakers could be the same, including their use of a language, but the meaning of their statements could still be different. For Quine, the behavior of the language speakers and their environments are the only sources of data the linguist has. Quine notes, "all the objective data [the linguist] has to go on are the forces that he sees impinging on the native's surfaces and the observable behavior, vocal and otherwise, of the native" (Quine 1960, 28). This is an empiricist doctrine that the vindicatory naturalist accepts.

Quine invites us to imagine that a rabbit runs past a native and the native says, "Gavagai" (Quine 1960, 29). Our initial thought is that this term "Gavagai" means rabbit, but it could mean all sorts of other things like white, furry, or rabbit's foot. In order to find out what "Gavagai" means, the linguist can point to things while asking "Gavagai?" and note when the native assents or dissents. How do we tell if the native is assenting or dissenting? Quine claims that the response that is "more serene in its effect" is the better candidate for assenting (Quine 1960, 29-30). This very comment from Quine suggests that he is operating with an underlying principle in order to discern assent from dissent. This principle will end up being a rationality principle, one

that interprets a language speaker based on what would make the language speaker more rational.

Skipping many of the intermediate steps that Quine takes in his thorough analysis, the linguist must ultimately divide the native utterances into words or phrases and hypothesize that certain English terms match these words, what Quine calls *analytical hypotheses* (Quine 1960, 68). Granting that Quine is correct up until this point, at best the linguist can only achieve a "semantic correlation of sentences" between English and the native language (Quine 1960, 71). One issue is that there will be many, mutually incompatible analytical hypotheses for any given term. This is called the "inscrutability of reference", which states that we cannot determine what any term refers to in a language. For instance, the word "Gavagai" could be translated as rabbit, or undetached rabbit part, or even rabbithood. The meaning could be even something more crazy, as long as the meanings of other words in the translation make sense of these crazy meanings. The second problem is that many rival systems of analytical hypotheses, i.e. translations, can match the observational evidence perfectly but will be incompatible with each other (Quine 1960, 73). To make things worse, there is no fact of the matter about which of these incompatible translations is correct; there is no determinate translation.

As I suggested earlier, even Quine seems to presuppose some sort of principle in order to discern assent from dissent. What could this underlying principle be? In Davidson's "On the Very Idea of a Conceptual Scheme", he starts with an interesting dilemma: there cannot be determinate translation without knowing the speaker's intentional states (like beliefs and desires), but we cannot know the speaker's intentional states without a determinate translation (Davidson 1974, 17). This point emphasizes the intimate relationship between other intentional states, meaning, and language. If we know the speaker's beliefs, we must know their desires in

order to arrive at a determinate translation. If we know the speaker's desires, we must know their

beliefs in order to arrive at determinate translation (Davidson 1974, 18).

In order to solve this problem, Davidson supposes that the speaker has intentional states

like beliefs and desires, that most of the beliefs are true, and that the speaker is rational

(Davidson 1974, 19). This rationality principle, which Davidson calls the "Principle of Charity",

can be formulated as follows:

> **Rationality Principle**: Given two theories of an agent, it is
> unreasonable to believe one according to which the agent is
> significantly less rational. (Sehon 2016, 27)

There is a question as to what "rational" really means in this context. Sehon provides two

further principles that explicate what is meant by rationality:

> **Means Principle**: Agents act in ways that are appropriate for
> achieving their goals, given the agent's circumstances, epistemic
> situation, and intentional states. (Sehon 2016, 27)

> **Goals Principle**: Agents have goals that are of value, given the
> agent's circumstances, epistemic situation, and intentional states.
> (Sehon 2016, 27)

The way we make sense of agents, according to the Means Principle and the Goals

Principle, is by evaluating the reasonableness of an agent's goals and what courses of action

would best achieve those goals given the agent's other intentional states like the agent's beliefs.

When I make use of the Rationality Principle, I am really making use of the The Means Principle

and the Goals Principle; the Rationality Principle is constituted by these two other principles.

The Rationality Principle would solve many of the problems that Quine faced in his

thought experiment that led to the indeterminacy of translation. The way we can decide between

two incompatible translations is by using the Rationality Principle. Whichever translation results

in the agent being more rational, that is the correct one. The problem with the natives and what they mean by "Gavagai" will also largely be solved by appealing to the Rationality Principle. We can merely look at the several translations and theories of the natives and find the one that makes them most rational. Needless to say, this does not mean that there will always be perfectly determinate translation. There will likely be situations where there are genuine puzzles as to what someone means by a statement even with the Rationality Principle. But, this does not mean that all translations that are compatible with the observable data are equal, and it does not mean that there is no fact of the matter about which one is right.

Initially, the Rationality Principle looks rather mysterious. How do we know it to be true? We seem to assume the existence of intentional states as well as some form of rationality. It seems one would have to do first philosophy in order to arrive at such a principle, something the vindicatory naturalist does not want to allow. Yet, there is another option for the vindicatory naturalist to affirm the Rationality Principle without resorting to asserting this principle outright as an *a priori* synthetic truth. This option involves Dennett's intentional stance.

Dennett defines the intentional stance as the following:

> **The Intentional Stance**: the strategy of interpreting the behavior of an entity (person, animal, artifact, whatever) by treating it *as if* it were a rational agent who governed its 'choice' of 'action' by a 'consideration' of its 'beliefs' and 'desires'. (Dennett 2009, 339)

The idea behind this strategy is that it can help us predict behavior. Unlike the Rationality Principle, taking the Intentional Stance does not require the assumption that the entity actually has these intentional states, but merely treats them as if they had these intentional states. One can "explain and predict their behavior by *ascribing* beliefs and desires" (Dennett 1971, 90). Dennett's example of this involves a chess-playing computer (Dennett 2009, 340-341). Given a certain chess scenario, the computer has a list of legal moves that it could possibly make. In

order to predict the computer's next move, one could look at the computer's code or even calculate the next move based on the electric circuits. Or, one could simply figure out what move is more rational by assuming that the computer has the desire to win and knows the rules of the game (Dennett 2009, 341). This latter approach will likely be the most effective and reliable way of predicting the chess-playing computer's actions. Taking the Intentional Stance allows you to predict the computer's next move in a faster and simpler manner.

In the case of the chess-playing computer, it was *designed* to be rational about chess, but how do we know that the Intentional Stance will work for other entities (Dennett 2009, 341)? Luckily, evolution endows organisms with desires and goals based on what would be best for the organism's survival and reproduction (Dennett 1971, 92). Once the goals and desires of an agent are known, maybe through evolutionary biology, one can infer the organism's beliefs based on the actions of the organism (Dennett 1971, 92). As Davidson noted, ascribing beliefs without assuming that the organism is also rational would be useless, which again means that the Intentional Stance requires the ascription of rationality to these organisms (Dennett 1971, 95).

There might be a few worries about the Intentional Stance. First, one worry might be that this Intentional Stance runs wild and that we ascribe intentional states and rationality to everything without justification. In a situation where the Intentional Stance is not predictive of future behavior though, the Intentional Stance should not be utilized; it is only utilized insofar as it is predictive of behavior. In the situations that it is predictive of behavior, it would be odd to argue that the Intentional Stance should not be used. In what sense is taking the Intentional Stance wrong if it is predictive of behavior?

Another worry might be that the Intentional Stance ascribes intentional states to entities that clearly do not have intentional states, like chess-playing computers. This is running under

the assumption that we already know which entities have intentional states and which do not. In what sense do chess-playing computers not have intentional states? What evidence is there for such a statement? It is obvious that chess-playing computers are not conscious and are not fully rational agents by any stretch of the imagination. Nonetheless, as far as the game of chess is concerned, the Intentional Stance is predictive of behavior. Why would the Intentional Stance be predictive of behavior if the chess-playing computer did not have intentional states? Insofar as ascribing the desire to win the game of chess and the belief that certain moves will better achieve that desire is predictive of the computer's behavior, we have reason to believe that the computer actually has these intentional states. The computer will only have intentional states related to chess, since the Intentional Stance will not be predictive of the computer when it plays checkers. In this respect, the computer's intentional states about chess are inherited from its designer.

Turning back to translation, the Intentional Stance is in effect the same as the Rationality Principle when it comes to interpreting an unknown language. The Intentional Stance ascribes intentional states and rationality to the speaker just as the Rationality Principle. If you accept that the Rationality Principle allows for largely determinate translation, then you must accept that the Intentional Stance allows for largely determinate translation.

The only difference between the Intentional Stance and the Rationality Principle is that the Rationality Principle assumes that the agent is rational and has intentional states. The Intentional Stance makes no such assumption. Instead, insofar as ascribing intentional states and rationality to the speaker is predictive of behavior, taking the Intentional Stance is justified. The Intentional Stance is a pragmatic version of the Rationality Principle. It is a strategy that can be employed in order to predict behavior. If it does not predict behavior, then it should not be employed.

The vindicatory naturalist can utilize the Intentional Stance as a pragmatic principle, without having to make any *a priori* judgments. Once the Intentional Stance becomes predictive of behavior, it is confirmed, just like all of the other types of propositions that we have been talking about. Like any other epistemic principle that is confirmed indirectly through scientific theory, the Intentional Stance is confirmed through creating theories of agents that predict behavior. Once the Intentional Stance is confirmed in this way, just like we accept the existence of mathematical objects, we must accept the existence of intentional states as a useful scientific posit.

It is confusing that the Intentional Stance, which was originally just a pragmatic principle, ends up confirming the existence of intentional states. How can a pragmatic principle bring ontological commitment to intentional states? Doesn't the Intentional Stance explicitly state that we only treat these entities *as if* they were rational and had intentional states? For the vindicatory naturalist, there is no real distinction between a pragmatic principle and a non-pragmatic principle in scientific theory. All the principles, including induction, simplicity, mathematical principles, and the Intentional Stance, are originally pragmatic. Even the more intuitive posits of scientific theory, like electrons, are originally pragmatic. Quine expresses this view about physical objects:

> The myth of physical objects is epistemologically superior to most
> in that it has proved more *efficacious* than other myths as a device
> for working a manageable structure into the flux of experience.
> (Quine 1953, 44) (emphasis added)

Once any of these posits like electrons, intentional states, and mathematics factor indispensably into scientific theories that are confirmed, they are all confirmed in the same way. Quine himself did not believe that intentional states might be confirmed in the same way as electrons and mathematical objects. Given his brand of naturalism though, I claim that he should

have believed in intentional states. In other writings, Quine claims that the "justification of science and evidence of truth is rather in successful prediction of observations" (Quine 2000, 412). Taking the Intentional Stance can be bewilderingly predictive of behavior. On a day-to-day basis, we all make successful predictions by taking the Intentional Stance toward each other, not to mention that this approach is extraordinarily useful in scientific endeavors. This commitment to intentional states is a logical extension of Quine's views and makes his brand of naturalism much more palatable.

To reiterate, since the Intentional Stance effectively is the Rationality Principle in practice, there is no longer a radical indeterminacy of translation. This has significant consequences for meanings as intentional states. The tell-tale sign of there being such a thing as meaning is that there is determinate translation. Otherwise, in virtue of what are there determinate and correct translations of languages? The very fact that there is determinate translation seems to entail that there is such a thing as meaning. Quine gestures at this fact when he says, "meaning, supposedly, is what a sentence shares with its translation" (Quine 1960, 32). In another context he reaffirms this claim when he states, "[t]heories with the same meaning must be seen as translations of one another" (Quine 1975, 80). And, once there is such a thing as meaning, then it seems that we can save the analytic-synthetic distinction after all. To keep track of all of the steps of argument in this section, I have formalized the steps in the following:

<u>Quine's Naturalism, Meaning, and the Analytic-Synthetic Distinction Argument</u>

1. If the Intentional Stance is predictive of human behavior, translation is largely determinate. [Translation and Rationality Thesis]
2. The Intentional Stance is predictive of human behavior. [Prediction Thesis]
3. Translation is largely determinate. [1, 2]
4. Translation is largely determinate if and only if meanings exist. [Translation-Meaning Biconditional]

5. Meanings exist. [3, 4]
6. If meanings exist, then there is a clear analytic-synthetic distinction. [Analyticity Conditional]
7. There is a clear analytic-synthetic distinction. [5, 6]

Quine seems to agree that what translations share is meaning. So if there are largely determinate translations, there must be meanings. Conversely, if translation is radically indeterminate, then this suggests that there is no such things as meanings. These claims are expressed by the Translation-Meaning Biconditional. Secondly, I argued that the use of the Intentional Stance is justified insofar as it is predictive of behavior. Once the Intentional Stance is justified by predicting behavior, we can achieve determinate translations since it essentially operates as the Rationality Principle. As it so happens, the Intentional Stance is extremely predictive of behavior, especially human behavior. These claims constitute the Translation and Rationality Thesis as well as the Prediction Thesis.

Finally, by establishing the existence of meanings, we also save the analytic-synthetic distinction. Quine originally rejects the distinction because nobody has drawn a clear line between the analytic and the synthetic. The definition of analyticity in terms of meanings he considers is as follows:

> **Analytic statement**: a statement that "is true by virtue of meanings and independently of fact" (Quine 1953, 21).

Quine rejected this definition of analyticity because he denied the existence of meanings as "obscure intermediary entities" (Quine 1953, 22). Even as Quinean naturalists, we can no longer be skeptical of meanings due to the Intentional Stance and since they are the best explanation as to why there is determinate translation. We can now draw a clear analytic-synthetic distinction with the existence of meanings.

If I am correct that the vindicatory naturalist and Quine should be committed to meaning and intentional states, this makes the view much more plausible overall. The lack of commitment to meaning and intentional states can no longer be a *reductio*.

III.3 Vindicatory Naturalism and Morality

During this entire discussion of vindicatory naturalism, I have avoided the topic of morality. Can moral propositions be saved in the same way that everything else has been saved through indispensability? It is clear that moral propositions are dispensable to certain scientific theories, like physical theories or biological theories. Moral propositions do not factor into these theories at all. This is precisely the reason that Quine was skeptical of objective moral values. In the following two quotes, he expresses his skepticism for moral values:

> The empirical foothold of scientific theory is in the predicted observable event; that of a moral code is in the observable moral act. But whereas we can test a prediction against the independent course of observable nature, we can judge the morality of an act only by our own moral standards themselves. Science, thanks to its links with observation, retains some title to a correspondence theory of truth; but a coherence theory is evidently the lot in ethics. (Quine 1978, 43)

> Extrapolation in morals has only our unsettled moral values themselves to answer to, and it is these that the extrapolation was meant to settle. (Quine 1978, 45)

Given that moral claims do not feature into scientific theories at all, there is no legitimate empirical confirmation for Quine. There is empirical confirmation in a certain sense, but the only empirical evidence available is our own intuitions and moral standards. Morality becomes something of a vicious circle according to Quine, where we extrapolate and generalize moral theories from our existing moral standards and intuitions but the only empirical evidence for these theories is again our moral standards and intuitions. For instance, we take a few intuitions

and standards about particular cases and make a general principle (e.g. the principle of utility), but then we test this principle against more intuitions and standards. Scientific theories, on the other hand, enjoy empirical confirmation not just from the inner workings of our mind, but from experiments in nature.

The vindicatory naturalist views aesthetics, for instance, in the same light. Aesthetic theory would look much like moral theory insofar as we would generalize from basic intuitions to general principles and test those principles back against our own intuitions. For instance, I might start at the intuition that the Isle of Skye is beautiful, form a general principle based on this (e.g. sweeping, green landscapes are beautiful), and test this general principle back against our intuitions and standards. Aesthetic theory is just as viciously circular as moral theory. The best we can hope for is consistency and coherence.

Although epistemic claims and moral claims are similar in many ways, the use of epistemic claims in scientific theory constitutes the difference between them; it constitutes the difference as to why we should be realists about epistemology and anti-realists about morality, according to the vindicatory naturalist. Traditional *a priori* epistemology, the first philosophy that the vindicatory naturalist wants to reject, would run into the same vicious circle as morality and aesthetics. We would extrapolate and generalize from existing epistemological intuitions and standards to epistemological theories, but these theories need only answer to our epistemological intuitions and standards themselves. Just like in the moral case, there might be a few intuitions and standards about particular cases and generalize to a general principle (e.g. the justified true belief view of knowledge), but this general principle can only be tested against more intuitions and standards. At best, traditional *a priori* epistemology could only achieve consistency and coherence.

The vindicatory naturalist reimagines epistemology and believes in epistemic claims insofar as they are indispensable to scientific theories and common-sense theory. This allows for the shattering of the vicious circle. These epistemic claims can now enjoy empirical confirmation against nature just like any other scientific claim. They do not merely enjoy empirical confirmation against our own intuitions that generated the claims in the first place as they do in traditional *a priori* epistemology.

The same point would follow for mathematics. Without science and common-sense theory, mathematics would be a viciously circular endeavor as well. We would start with basic intuitions, or definitions, and prove mathematical theorems until we either get an inconsistency or reach an unintuitive result. It is not until mathematics factors into scientific theory and common-sense theory that it can enjoy empirical confirmation, aside from being confirmed by our own intuitions and definitions that gave rise to the mathematical system in the first place.

Granting that Indispensability Arguments work, which one might still doubt, it is not a very contentious point to claim that mathematical propositions and epistemic principles are operative in scientific theory whereas moral and aesthetic principles certainly are not. We have to remember that the vindicatory naturalist does allow for common-sense theory as well as theories of agents as legitimate theories about the world. Otherwise, we would not know any elementary facts about our own lives. It is possible that, while moral principles are not operative in scientific theory, they might be operative in common-sense theory or theories of agents.

One might argue that moral concepts and moral value factor indispensably into common-sense theory and theories of agents. Since moral concepts and moral value are indispensable in this manner, we have reason to believe in them, just as everything else for a Quinean naturalist. After all, why should we cut out moral concepts and moral value from the web of belief? As

another example, take induction. Scientific theory and common-sense theory operate with a principle of induction. But let us define a new principle, called "induction*". Induction* states that events in the future will resemble events in the past, up until year 4000. Why do we have reason to believe in induction over induction* if they would operate equally as well in scientific theory? The best answer seems to be that current scientific theory and common-sense theory operates under induction, not induction*. Therefore, for the time being, we should just accept induction until we run into empirical evidence that forces us to reconsider it.

The common-sense naturalist might claim that cutting out moral concepts and moral value would be unjustified if we are allowed to believe in induction. Cutting out moral concepts and moral value would be like cutting out induction for induction*. We *could* do this, but no one seriously considers this option until we run into empirical evidence to change our mind about induction. It would be unreasonable to switch out induction for induction* in our scientific and common-sense theories because no empirical evidence has led us to doubt induction so far. In the same way, we could cut out moral concepts and moral value, but since they have been so well-incorporated in common-sense theory and theories of agents so far, there is no real reason to be so skeptical of them. In the same way that we should just accept induction over induction*, we should accept moral concepts and moral value for the time being.

There might yet be a difference between induction and morality. *Some* form of induction is indispensable to scientific theories and common-sense theory, whether it be induction or induction*. Moral concepts and moral value, conversely, might be altogether dispensable to both scientific theories and common-sense theory. Cutting out induction for induction* would not be analogous to this. What would be more analogous is if we had two concepts of moral value: moral value and moral value*. If both operated equally well in our common-sense theory, but we

currently operate with moral value, there is no reason to substitute moral value* for moral value. This is not the case. It seems like we can cut out moral value and moral concepts entirely from both scientific theory and common-sense theory in a way that we cannot cut out induction.

How might these arguments look in more detail? When constructing a theory of an individual agent, taking the Intentional Stance allowed for the prediction of future behaviors. These theories were enough to establish the existence of intentional states. One might argue that this same approach works for morality.

Recall the two principles that were thought to constitute the Rationality Principle:

> **Means Principle**: Agents act in ways that are appropriate for achieving their goals, given the agent's circumstances, epistemic situation, and intentional states.

> **Goals Principle**: Agents have goals that are of value, given the agent's circumstances, epistemic situation, and intentional states.

With respect to the Goals Principle, which goals are the ones that are of value? Are there goals that are fundamentally more valuable than others? Or, do goals have value merely as a function of the agent's own desires and beliefs? A vindicatory naturalist about morality might claim that moral value sneaks into the Rationality Principle here. The idea is that certain goals are of moral value and others are not. The further claim would be that it is more useful to use moral value as an indicator of what goals rational agents would have; it gives us better predictive results. Sehon seems to advocate a view of this sort, one in which humans that have goals that are morally valuable are more comprehensible, and thus more rational. He advocates Davidson's view that one has to value truth and moral goodness in order to be fully rational and interpretable (Sehon 2016, 146). He also clearly states that his view pertaining to rationality "does imply that if an action is immoral it is therefore, to that extent, of less value, and was therefore, to that extent, less rational" (Sehon 2016, 148).

What matters most for the vindicatory naturalist is if the most predictive version of the Rationality Principle is one that indispensably makes use of moral value. If it were the case that we were better able to predict behavior in humans and behavior in animals more broadly by embedding moral value in the Goals Principle, then moral value will have sufficiently passed the test. We should be vindicatory naturalists about morality in such a case, which means we would be moral realists. The question remains as to whether the Rationality Principle is more predictive of behavior if it incorporates moral value.

This is largely an empirical question, and one that I will not be able to definitively answer here. There are some considerations that might lead us to think that moral value is not indispensable to the Rationality Principle, and does not make it more predictive. These considerations are three-fold: (1) an approximation of moral value helps us comprehend other humans in one sense, but not in the important sense, (2) instead of moral value, we would be better off in our predictive measures if we merely considered human desires, and (3) if we were to encounter an intelligent alien race that did not share our moral values, they would not be less rationalizable once we understood their evolutionary history and fundamental drives and goals.

In one sense of "comprehend", Sehon is of course right that humans who have immoral goals are less comprehensible. They are less comprehensible in the sense that we cannot really imagine having such goals. For instance, take the quintessential evil person: Hitler. Hitler had many morally grotesque goals by all standards. It is hard to comprehend seriously having these goals, thereby making Hitler less of a comprehensible person. Does this mean that we could not predict Hitler's behavior just as well with the Rationality Principle? I venture to say no. His behavior would be as predictable as other people's behavior. The fact that Hitler's goals were utterly immoral does not prevent us from accurately predicting his behavior. As long as Hitler

had coherent goals, even if they were immoral, we could predict his behavior just as well as if he had moral goals. Here we have two senses of "comprehensibility". One sense of comprehensible is that we cannot imagine holding the intentional states of Hitler. The other sense of comprehensible is how predictable his behavior is using the Rationality Principle. It is only this latter sense of comprehensibility that matters for commitment to objective moral value.

While it is a controversial way to go, one might argue that the reason why Hitler's behavior would still largely be predictable by the Rationality Principle is because most of his goals were actually not immoral. Of course, many of his goals were immoral, but Hitler had personal relationships with family members. In these relationships, for instance, Hitler might have had goals of moral value, even though his political goals were abhorrent. It is the fact that even Hitler had *some* goals of moral value that makes us think we could predict his behavior approximately as well with the Rationality Principle. If there were a human that exclusively had immoral goals, then this human would not be as predictable. This anti-moral human would show that moral value makes agents more rational and predictable. This agent is hard to imagine, largely because most humans do not fit this criterion. But, since I will talk about intelligent aliens that fit this criterion, I will save this discussion for that point.

The second objection is the crucial point. When Dennett makes a more detailed account of what goals intentional systems might have, he claims that at base they will desire survival and procreation, which will lead to other desires like desires for "food, security, health, sex, wealth, power, influence, [...] and also whatever local arrangements tend" (Dennett 1987, 49). It is evolution that endows most intentional systems with their goals and desires. In the cases of non-human animals, moral value will be of no use when predicting behavior. A complete

understanding of the non-human animal will only require an understanding of their evolutionary history and the idiosyncratic circumstances unique to that particular organism.

For human animals, it will be much more complicated. Evolution will be helpful in understanding some of our desires, but not all of them. One would also have to understand cultural and social contexts when understanding desires. Idiosyncratic social relationships might lead to vastly different desires and goals. Moral value will already be accounted for by these evolutionary, cultural, and social contexts. It would be redundant to explore the evolutionary, personal, cultural, and social context of an individual's life and thereafter consider what desires or goals would be of objective moral value. To be clear, I am not assuming that moral values are simply cultural or social artifacts with no basis in reality. What I am asserting is that the predictiveness of the Intentional Stance will not be increased by adding moral value after already considering all of the other causal sources of human desires. In fact, adding an objective sense of moral value might actually decrease predictiveness, given variability of moral value across cultural and social contexts. Without adding moral value, we have already maximized the predictiveness of the human.

To make this point more clear, consider again aesthetic value. It seems that one might be able to predict the behavior of humans better if one of their goals is to seek beauty. Where do people go on vacations? For the most part, they go to beautiful places. Why do people go to art museums or to music concerts? To seek beauty. Taking into account beauty seems like it then would greatly aid in predicting human behavior, especially predicting what humans will do with their free time. When first considering the desire of a particular human, as stated before, these desires will be evolutionarily, culturally, and socially mediated. Once we understand the evolutionary, cultural, and social backdrop of a particular person, considering aesthetic value in

any objective sense would be redundant at best or might make the predictiveness of the person worse. We have already maximized the predictiveness of people without adding an objective sense of aesthetic value.

This is ultimately still an empirical question as to what variations of the Intentional Stance and Rationality Principle are most predictive of behavior. Yet, it seems just as likely that aesthetic value would help with prediction as moral value. So if we are committed to one, we should also be committed to the other. It seems like we might be able to put this claim to the test. Consider first someone who is blind. Is this person's behavior any less interpretable and predictably by the Intentional Stance than a person with perfect vision? Probably not. We can understand and predict blind people's behavior just as easily with the Intentional Stance. Since we can rationalize the blind person just as well as anyone else without objective aesthetic value (at least visual aesthetic value), then it seems visual aesthetic value is not needed.

What about a *morally* blind person? Is this person's behavior just as interpretable as the visually blind person? It is not as clear, but I still venture to claim yes. This morally blind person still might act morally in certain circumstances, but this might just be to gain social approval and to avoid bad consequences. Even a morally blind person might not commit murder if they really do not want to go to prison, for instance. As long as this morally blind person has other goals and desires that are coherent, it seems this person will be just as interpretable.

As the final objection to this view that moral value is indispensable to the Rationality Principle, consider an intelligent alien that I shall inventively call "Alien" (I am imagining pretty much the aliens from the 1979 movie *Alien*, but with certain differences that I will specify). Dennett characterizes different orders of intentional systems. They are as follows (Dennett 1983, 345):

First-order intentional system: a first-order intentional system has beliefs and desires, but does not have beliefs and desires *about* beliefs and desires. (e.g. A believes that p, A wants that p)

Second-order intentional system: a second-order intentional system has beliefs and desires *about* beliefs and desires. (e.g. A wants B to believe that p, A believes that A wants that p)

Third-order intentional system: a third-order intentional system has beliefs and desires *about* beliefs and desires that are *about* beliefs and desires. (e.g. A wants B to believe that A wants that p)

And so on. Most humans can only keep track of about five or six orders, according to Dennett (Dennett 1983, 345). As a matter of fact, Aliens can keep track of about five or six orders as well. Why is this relevant? It is relevant insofar as the Aliens having the intelligence and ability to consider other intentional systems to the level that we do. Further suppose that Aliens have a capacity to understand and develop language as well as cultivate complex social structures. Since the evolutionary ancestors of Aliens lived in swamp-like areas, Aliens consider certain sights to be enjoyable to be around, where these sights are usually brown, muddy, and smelly areas. Lastly, as seen in the movie, Aliens have no recognizable sense of moral value. As long as it does not conflict with any of their goals, they have no qualms with terrorizing other living creatures, including human beings.

How predictable would Aliens be by the Rationality Principle? Would it help to add any objective sense of moral value to the Rationality Principle in order to predict the behavior of Aliens? What about an objective sense of aesthetic value? I claim not. First, we can fully explain and predict Alien behavior around swamp-like areas. Aliens find these areas very aesthetically pleasing. By and large, humans do not consider muddy and smelly areas to be aesthetically appealing. These views about what is aesthetically appealing are likely divergent and mutually exclusive. Adding an objective notion of aesthetic appeal to the Rationality Principle would

decrease the predictiveness of the Rationality Principle for either humans or Aliens. That is, if we formulated a general principle of aesthetic value around Alien aesthetic appeal, this would make the Rationality Principle less predictive for humans, since human aesthetic appeal is much different. The converse also holds. An objective notion of aesthetic value decreases predictiveness in either case.

The same analysis applies to moral values. We can fully explain and predict Alien behavior when it comes to terrorizing human beings and other living creatures. By and large, humans would consider this desire and practice morally obscene. These views about what is of moral value are likely divergent and mutually exclusive. Adding an objective notion of moral value would decrease the predictiveness of the Rationality Principle no matter which way you cut it. It seems that Aliens could be exceedingly rational in their pursuits of their goals, but none of these goals are ones that can be characterized as morally valuable. This does not make Aliens less predictable. Aliens are a seemingly a clear case where moral value is dispensable to the Rationality Principle, since Aliens are interpretable despite their supposed moral corruption.

The idea behind this Aliens case is that Aliens exhibit radically different senses of aesthetic and moral value. This does not mean these Aliens are less predictable by the Rationality Principle. They still might be highly intelligent and rational, maybe even more so than humans. The case of Aliens is one where aesthetic and moral value seem entirely dispensable to the Rationality Principle. This thought experiment still may not convince some, but there is a puzzle as to how the defender of moral value will discount aesthetic value in the same way. One might be willing to accept an objective sense of aesthetic value as well. But, it seems the most plausible and consistent to deny that we can be vindicatory naturalists about aesthetics and morality.

I do not take these objections to be decisive by any means. It could be that moral value really does increase the predictive power of the Rationality Principle, in which case we should be vindicatory naturalists about morality. This could certainly be the case considering how embedded moral concepts and moral value are in common-sense theory. But, given my objections and thought experiment, it seems much more likely that moral value is not needed for the Rationality Principle, just as aesthetic value is not needed.

If vindicatory naturalism is not plausible for morality, we should accept moral anti-realism, just as we should accept aesthetic anti-realism. This would likely entail believing that moral claims and aesthetic claims merely assert causal tendencies in humans instead of objective truths about what we ought to do and objective truths about beauty. We would become eliminative naturalists about morality and aesthetics. The fact that I believe a certain action is immoral would be a combination of causal claims about my psychology, cultural context, and social context. There would be no universal prescriptivity in such an account. In developing moral theory, it would be centered around conditional prescriptivity, where my course of action is determined by the end-goal. If I care about relieving suffering, which I do, then the best course of action becomes a question of empirical science. In the same light, if I care about seeking beauty, which I do, then the best course of action becomes an empirical question.

As with Quine, I believe that most people just happen to care about the same end-goals when it comes to moral and aesthetic value (Quine 1978, 44). Most people care about relieving suffering and seeking beauty, for instance. Luckily this is the case. Does this anti-realist view about morality and aesthetics undermine them? This is a topic for another time, but I am strongly inclined to say no. Just because there is no universal prescriptivity telling me to act morally or appreciate beauty does not mean that these things become less important to my life or human

society more broadly. Even if morality merely concerns causal tendencies, causal tendencies are still important. I prefer certain causal tendencies to obtain rather than others. It just so happens that we all generally care about the same sorts of causal tendencies. This is all that is required for morality and aesthetics to maintain their importance.

III.4 First Philosophy

There is a lingering worry with Quinean naturalism that I have not yet addressed, which concerns how one can argue that we should be Quinean naturalists in the first place. How can a vindicatory naturalist philosophically argue for her own view, given that only scientific theories and common-sense theory are the arbiters of truth? Two of the central doctrines of the vindicatory naturalist's views are epistemological holism combined with indispensability and Quinean naturalism. Recall what epistemological holism combined with indispensability and Quinean naturalism claim:

> **Epistemological Holism + Indispensability**: we have reason to believe in an entity if it is indispensable to our best scientific theories. We have reason to believe a proposition if it is indispensable to our best scientific theories.

> **Quinean naturalism**: we have reason to believe in an entity *only* if it is indispensable to our best scientific theories. We have reason to believe a proposition *only* if it is indispensable to our best scientific theories.

The problem for the vindicatory naturalist is this: if we are Quinean naturalists, how can we argue that Quinean naturalism and epistemological holism are true? The statement of Quinean naturalism does not seem to feature into scientific theories, at least it is not operative in the same way as mathematics or epistemic principles. Quinean naturalism and epistemological holism do not seem to be operative in common-sense theory either. And, if Quinean naturalism

and epistemological holism feature neither in scientific theory nor common-sense theory, how do we have reason to believe them? According to the Quinean naturalist's own principle, it seems she has no reason to believe Quinean naturalism or epistemological holism.

Another way to put the dilemma to the vindicatory naturalist is this: the Quinean naturalism principle tells us that we should defer to the sciences to tell us what to believe and what to be ontologically committed to, but by arguing for Quinean naturalism we are no longer doing science. The vindicatory naturalist only wants to affirm principles that ultimately tie to experience and observation. Do these principles tie back to experience and observation? The answer might be no, in which case it seems that we have slipped back into the exact sort of first philosophy that the Quinean naturalist wants to avoid.

The non-naturalist may point all of this out to the vindicatory naturalist. The non-naturalist may claim: in arguing for her position, the vindicatory naturalist has actually affirmed non-naturalism, at least for epistemology. The arguments put forth by the vindicatory naturalist themselves do not tie back into experience. The non-naturalist might claim that the vindicatory naturalist, by arguing against traditional *a priori* philosophy, has affirmed *a priori* philosophy in the same breath.

In this situation, I am reminded of the dialogue between *Philo* and *Cleanthes*. At a certain point in the dialogue, *Philo* is arguing against *Cleanthes'* conception of God, but after *Philo* has made his point, *Cleanthes* says:

> [These suppositions] strike me, however, with no horror, especially when proposed in that rambling way in which they drop from you. On the contrary, they give me pleasure when I see that, by the utmost indulgence of your imagination, you never get rid of the hypothesis of design in the universe, but are obliged at every turn to have recourse to it. To this concession I adhere steadily; and this I regard as a sufficient foundation for religion. (DCNR 5.13)

The non-naturalist might make a similar retort to the vindicatory naturalist. In every utterance that the vindicatory naturalist makes, she makes recourse to first philosophy in exactly the manner she was hoping to dispel. Thus, the non-naturalist might be quite content with the attacks on non-naturalism in this paper, as they make use of the same methods that the vindicatory naturalist rejects.

To be clear, there are two problems here for the vindicatory naturalist. First, the vindicatory naturalist's position is entirely dependent on indispensability arguments. The vindicatory naturalist uses indispensability arguments to argue for everything that the vindicatory naturalist holds to be true. If indispensability arguments are not themselves connected to science, then by virtue of the vindicatory naturalist's rejection of first philosophy, the vindicatory naturalist should reject the indispensability arguments. It is difficult to see what the vindicatory naturalist has left.

The only feasible response for the vindicatory naturalist is that these indispensability arguments are in fact somewhere within the web of belief in scientific theory or common-sense theory. This could be empirically false, in which case the vindicatory naturalist's view falls apart. If this is the case, then non-naturalism becomes the most likely alternative, given the extremes of eliminative naturalism. The non-naturalist could even accept indispensability arguments as good ways of coming to ontological commitments, but still believe that there are genuinely things that can be known *a priori* with no empirical verification.

The second issue is that the vindicatory naturalist has not given an explicit argument for Quinean naturalism, the view that we do not have reason to believe in anything unless it is indispensably part of scientific theory or common-sense theory, which both ultimately tie back to

experience. How can the vindicatory naturalist argue for such a view? If no argument can be given, what reason do we have to believe the vindicatory naturalist?

There are several ways that the vindicatory naturalist might respond to this problem. The vindicatory naturalist might first respond by claiming that we have empirically found it to be the case that only empirical judgments lead to good predictions and understandings. Quine claims this much when he states the following:

> Even telepathy and clairvoyance are scientific options, however moribund. It would take extraordinary evidence to enliven them, but, if that were to happen, then empiricism itself [...] would go by the board. … The collapse of empiricism would admit extra input by telepathy or revelation, but the test of the resulting science would still be predicted sensation. (Quine 1990, 20-21)

The vindicatory naturalist and Quine are open to the possibility of telepathy and revelation, but as a matter of empirical fact, they have not produced any results. The justification of empiricism, Quine suggests, is itself empirical. Does this solve the problem for the vindicatory naturalist? I claim that it does not. The vindicatory naturalist and Quine are still irredeemably committed to the fact that empirical evidence is what matters, which is what Quine suggests when he says that "the test of the resulting science would still be predicted sensation". By suggesting that we have justified empiricism empirically, we are still operating with an underlying principle that gives weight to empirical evidence instead of some other type of evidence. The vindicatory naturalist and Quine prize prediction and empirical evidence, but this very commitment seems like an *a priori* commitment.

It might be the case that this is a fundamental disagreement. The vindicatory naturalist will simply not accept non-empirical evidence. The vindicatory naturalist cannot justify this claim *a priori*, because this would be to break the very rule in question. Consider another

situation. Suppose that a theist fundamentally believed that divine revelation is the best methodology for approaching epistemological and metaphysical questions. Suppose further that the theist was adamant that a refutation of divine revelation as a good methodology must utilize the method of divine revelation itself. We are obviously never going to satisfy this theist because, by our own principles, we cannot give such a refutation. This should not bother us. Likewise, the vindicatory naturalist hold her position without giving an explicit *a priori* argument for it. Such an argument would employ methodologies that the vindicatory naturalist does not accept. Instead, one either accepts empirical evidence as the only evidence or not as a fundamental point.

This analogy with the theist and divine revelation does not do justice to the situation though. The non-naturalist is not adamantly demanding that an *a priori* argument for Quinean naturalism should be given, as this is an unreasonable request given the Quinean naturalist's views. This demand would indeed be analogous to the case with the theist. Instead, the non-naturalist is simply looking for *any* argument for Quinean naturalism, *a priori* or otherwise. But, it seems that the Quinean naturalist cannot give an empirical argument as to why we should prize prediction and empirical evidence above all else. And of course, the Quinean naturalist cannot give an *a priori* argument either. The Quinean naturalist might be stuck.

Considering both issues, it seems that both are convincing ways of pushing back against the vindicatory naturalist. The vindicatory naturalist heavily relies on indispensability to establish all of her views. If there is no satisfying account as to indispensability fit in the web of belief of scientific theory or common-sense theory, this is very troubling for the view. Further, the insistence on empirical evidence and prediction is characteristic of the vindicatory naturalist and Quine, but there might not be any argument for this fundamental assumption. The non-

naturalist might push the vindicatory naturalist and Quine to accept at least some *a priori* judgments in order to make vindicatory naturalism coherent, let alone plausible. So far, these are the most troubling aspects of vindicatory naturalism. If they cannot be solved, the non-naturalist may be justified in standing by traditional first philosophy.

Concluding Remarks

After taking into consideration these broad arguments regarding non-naturalism and naturalism, I have argued for the following. Non-naturalism for mathematics, morality, and epistemology are all mysterious for the same reason: their epistemology. In order for non-naturalism to work, we would have to allow a strange Intuitionism as a legitimate epistemic practice. This is a big pill to swallow.

The eliminative naturalist runs into the problem of conceptual discontinuity. The eliminative naturalist's epistemology and morality are about causal tendencies in humans rather than being about justificatory relations and what we ought to do, as epistemology and morality are traditionally conceived. This is not a knockdown objection by any means, since we might simply be mistaken in pursuing the traditional epistemological and moral enterprises, but it certainly renders eliminative naturalism less attractive. Then, I argued that epistemic anti-realism, which is the view of an eliminative naturalist, leads either to global nihilism or vindicatory naturalism. In both cases, we should not accept eliminative naturalism for epistemology.

Finally, I have argued that vindicatory naturalism provided a balance between non-naturalism and eliminative naturalism. There is no need to be committed to a strange Intuitionism, but there is also no need to deflate mathematics and normative epistemology as legitimate enterprises. These enterprises are what we think they are about: numbers and evidential relations, not causal tendencies in humans. The only sacrifice the vindicatory naturalist has to make is that these enterprises are at base empirical, and enjoy confirmation through common-sense theory and, ultimately, science. This supposed sacrifice, instead of being a crutch of this view, is one of its strengths. Everything is revisable based on our theories of the world.

The most significant weakness of the view is that indispensability arguments and Quinean naturalism themselves do not seem to fit well in the vindicatory naturalist's picture. If the vindicatory naturalist cannot resolve this fundamental issue, then non-naturalism seems like the most plausible view. Once we accept that non-naturalism is plausible for mathematics and epistemology, there seems no reason to be eliminative naturalists about morality anymore. If intuitions can bring us to objective mathematical and epistemic truths, there seems no reason to deny that this would be the case for morality as well. If vindicatory naturalism fails, we should be non-naturalists about mathematics, morality, and epistemology.

Although vindicatory naturalism has the fundamental issue of justifying its central doctrines, vindicatory naturalism gives us a better and more holistic understanding of science. One might have thought that science only investigates causal claims. Under this narrow view, science only investigates causal claims about electrons, proteins, genes, and the rest. Under vindicatory naturalism, science still investigates these claims, but it also investigates other claims. It investigates mathematical and epistemic claims as well. Although these mathematical and epistemic claims are not causal claims about the world, this does not mean they are not put to the test in scientific theories. When formulating physical theory, we are not just testing whether we have the right account of fundamental particles for instance. We are also testing for our more fundamental mathematical and epistemic claims. If certain scientific theories are not working out, scientists not only can change the physical particles they are positing, but they can also change the epistemic principles and mathematical structures they are using. This is in fact what scientists have been doing all along.

Vindicatory naturalism also gives us a better understanding of common sense. It originates in toddlers, where they start to form rudimentary theories about the world. At some

point, we arrive at a full-fledged common-sense theory about the world, one in which tables, chairs, and people exist. This common-sense theory is not different in kind from scientific theory, but is just less rigorous in its methodology. This means that common-sense theory is eclipsed by scientific theory on many issues, but this does not make the posits of common-sense theory unreasonable. We have reason to believe almost all of our common-sense claims, until they contradict what science tells us.

There is the final question as to what comes of philosophy under vindicatory naturalism. Needless to say, this view does not assert that philosophy has no value. Yet, when it comes to investigating epistemology and metaphysics, one should investigate questions that are much closer to the scientific endeavor or common sense. The philosopher could work in concert with scientists, and help answer scientific questions that are not being adequately addressed by scientists. Philosophers of biology, for instance, can make progress on epistemological and metaphysical issues as they pertain to biology by working closely with biologists themselves. This is certainly the case for many philosophers of biology and occasionally biologists themselves will contribute to the philosophical literature.

This view of philosophy is the view that Maddy takes, which she calls the "Second Philosopher". She describes what projects are available to the Second Philosopher in the following:

> [The] Second Philosopher is equally at home in anthropology, astronomy, biology, botany, chemistry, linguistics, neuroscience, physics, physiology, psychology, sociology, ... and even mathematics, once she realizes how central it is to her ongoing effort to understand the world. Her interest in other subjects, at least as far as we see her here, is limited to her pursuit of their anthropology, psychology, sociology, and so on. She uses what we typically describe with our rough and ready term 'scientific methods', but again without any definitive way of characterizing

exactly what that term entails. She simply begins from commonsense perception and proceeds from there to systematic observation, active experimentation, theory formation and testing, working all the while to assess, correct, and improve her methods as she goes. (Maddy 2007, 2)

As thus described, the Second Philosopher sounds like a scientist. But, the Second Philosopher does not need to take on all of the activities of science. The Second Philosopher can wrestle with more conceptual disputes within a scientific endeavor, since this is an area where the Second Philosopher will be well-suited to help. The Second Philosopher can especially tackle questions that do not fit into a particular scientific domain cleanly (Maddy 2007, 115).

Another route for the philosopher to take is to work closer with common-sense theory. Reconciling common-sense theory and scientific theory is one way to work with common-sense theory. Another way is simply to work with common-sense theory itself. Clarification and improvement of common-sense theory is what I take many philosophers to be doing and is a much worthwhile cause.

The only philosophy that the vindicatory naturalist excludes is abstruse philosophy that in no way connects to scientific theory or common-sense theory. This is the philosophy that in no way ties back to experience and empirical evidence. This sort of philosophy cannot be incorporated into theories about the world, and thus cannot be empirically confirmed. The only confirmation available is human intuition, which the vindicatory naturalist believes will not lead to fruitful discoveries. These projects should be abandoned for projects more closely related to scientific theory or common-sense theory. In order to study metaphysics, for instance, one should be working closely either with scientific theory or common-sense theory.

It is important to note that many of the philosophical questions that have kept philosophers interested for centuries are legitimate and important questions. The problem is not

that we have the wrong questions, but the wrong approach in certain instances. The approach is no longer to form general principles based on intuitions of certain cases, just to thereafter test them against our intuitions of other cases. The approach is rather to join other disciplines in their pursuits, or to work closely with common-sense theory. Philosophy cannot achieve answers to these questions on its own. Instead, philosophy joins the rest of the sciences and common sense in order to answer these questions. The vindicatory naturalist is not replacing philosophy, merely reimagining it.

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