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An Alternative Approach to Analyzing Disposition Ascriptions

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AN ALTERNATIVE APPROACH TO ANALYZING DISPOSITION ASCRIPTIONS

By

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Dedicated to my friends and family

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ABSTRACT

This dissertation will explore the topic of disposition ascriptions. A disposition ascription is any statement that ascribes a disposition to an object. The statement ‘Glass is fragile’ is one example. A popular account – called the conditional account – attempts to understand these statements in terms of counterfactuals. Recently, however, philosophers have offered objections to the conditional account on the grounds that it succumbs to counterexamples or that it rests on an incorrect assumption. I attempt to defend the account against some of these objections by offering an alternative analysis that builds on a distinction between single-track and multi-track ascriptions. In chapter one, I defend the conditional account from the problem of antidotes. I argue that antidotes admit of two different interpretations, and only one of them threatens the conditional account. In chapter two, I describe some problems for the traditional approach to analyzing disposition ascriptions, and I use these problems to motivate looking for an alternative account. This account is the subject of chapter three, in which I present and defend my proposal. Finally, in chapter four, I explain why my alternative is preferable to another account that was developed recently by Barbara Vetter.

CHAPTER 1

TWO THESES ABOUT MASKING

1.1 Introduction

It is tempting to think that statements ascribing dispositions to objects can be analyzed with counterfactual conditionals. For example, to say ‘Salt is soluble’ is to say that, if salt were placed in water, it would dissolve. Or to say ‘Glass is fragile’ is to say that, if glass were struck, it would break. In general terms, to say ‘ x has D ’ is to say that, if x were placed under such-and-such conditions, it would behave in a certain way. This is called the *conditional analysis of disposition ascriptions* — or just the “conditional analysis,” for short.

The conditional analysis is attractive because it provides an intuitive, straightforward way to interpret disposition ascriptions. But philosophers have attacked this analysis, claiming it is subject to various counterexamples. One alleged counterexample is called *masking*. If a disposition is masked, then an object, even in the presence of its stimulus, would not undergo the manifestation. A masker prevents the manifestation, but it does so without removing the disposition itself or preventing its stimulus.

Masking seems to challenge the conditional analysis. Suppose that a poison is ingested, and then shortly afterwards an antidote is ingested. Although the poison retains the disposition to cause harm, it would not cause harm because of the antidote. So, it seems that the claim ‘ x is poisonous’ cannot be analyzed with the counterfactual ‘If x were ingested, it would cause harm.’ This might not falsify the conditional analysis, but it presents a challenge: What counterfactual should be used to analyze a claim such as ‘ x is poisonous’?

In this chapter, I aim to show how the conditional analysis can avoid the challenge posed by masking. My argument is based on a distinction between two possible ways to understand masking. One way is in accordance with the *antidote hypothesis*; the other is in accordance with the *stimulus prevention hypothesis*. Only the former spells trouble for the conditional analysis. However, I argue that there is no principled reason to prefer one hypothesis over the other. This creates a problem for those who use masking as a counterexample to the conditional analysis. Either they must (a) justify the antidote hypothesis over the stimulus prevention hypothesis or (b) concede that masking is not necessarily a problem for the conditional analysis. To make matters

worse for option (a), two obvious justifications fail — namely, the *shared stimulus argument* and the *intuition argument*. I conclude that, in the absence of any other justification, masking does not necessarily spell trouble for the conditional analysis.

This chapter is structured as follows. In section 1.2, I give a brief explanation of masking, which sets the stage for the shared stimulus hypothesis and the antidote hypothesis in section 1.3. In sections 1.4 and 1.6, I explain the *shared stimulus argument* and the *intuition argument*. I take these to be the primary supporting arguments for the antidote hypothesis. After an explanation of each argument, I offer a response. In section 1.5, I offer two different reasons to believe that the shared stimulus argument is unsound. In section 1.6, I explain why a certain premise in the intuition argument lacks sufficient support. Finally, in section 1.7, I give some brief concluding remarks about what I believe myself to have established.

1.2 Masking

Objects do not always behave as they are disposed to. Sometimes fragile things do not break, soluble things do not dissolve, flammable things do not catch fire, and so on. One explanation is that dispositions have *maskers*. Maskers were made famous by Alexander Bird in his paper *Dispositions and Antidotes*, where he describes the idea using the example of an antidote.¹ An antidote stops poison from causing harm when it is ingested. According to Bird, the antidote does not remove the poison's disposition to cause harm; it rather prevents the harm by breaking the causal chain joining the stimulus to the manifestation.

This example suggests a general account of masking. Let x be an object that is disposed to give response r when subjected to stimulus s . A *masker* (or antidote) is something that interferes after s occurs but before r . Let us say the stimulus occurs at t and the response normally occurs at t' . Then, a *masker* (antidote) can be defined as follows:

(Masker) “An antidote to the above disposition would be something which, when applied before t' , has the effect of breaking the causal chain leading to r , so that r does not in fact occur” (Bird, 1998, pg. 228).

¹ Bird, 1998

This definition essentially involves two claims. (1) Dispositions have stimulus and manifestation conditions that are joined together in a *causal chain*. (2) A masker is something that *breaks* a disposition's causal chain. The key notions are that of a *causal chain* and that of *breaking* a causal chain. I will begin by examining the first of these notions (causal chain), and then I will explain the sense in which a masker is said to “break” a causal chain.

1.2.1 Breaking Causal Chains

Some events are causally related to others. Striking a flint creates a spark, which ignites a fire. The events *striking*, *sparking*, and *igniting* stand in a causal relationship: the first event causes the second, and the second event causes the third. The whole sequence of events constitutes what I will call a *causal chain*.

In general terms, a *causal chain* is any set of events whose members are ordered by their causal relationships to one another. For example, $\langle \textit{striking}, \textit{sparking}, \textit{igniting} \rangle$ is a causal chain, because striking causes sparking, and sparking causes igniting. But $\langle \textit{igniting}, \textit{sparking}, \textit{striking} \rangle$ is *not* a causal chain, because sparking does not cause striking. In a causal chain, each event in the sequence *causes* the very next event. This is what distinguishes a causal chain of events from an arbitrary chain of events.

The causal chains that concern us here are *dispositional causal chains*. These are causal chains that begin with an object undergoing some stimulus and end with the object undergoing the manifestation. For example, if the stimulus for fragility is *striking* and the manifestation is *shattering*, then $\langle \textit{striking}, \textit{fracturing}, \textit{shattering} \rangle$ is a dispositional causal chain. Note that dispositional causal chains can be either *binary* or *extended*. A binary chain has exactly two members: the stimulus and manifestation ($\langle S, M \rangle$). Otherwise, if there are more than two members, then the chain is *extended* ($\langle S, x, y, z, \dots, M \rangle$). The events between the stimulus and manifestation — *x*, *y*, *z*, and so on — are neither part of the stimulus nor the manifestation. They “bridge the gap” (so to speak) between the two.

Causal chains are sometimes broken. Sometimes striking a flint does not cause a spark — the flint might be too wet. Or sometimes dropping a vase does not cause it to break — the vase might be wrapped in Styrofoam packaging. Since causal chains can be broken, we should not think of them as *actual* sequences of events. They are more like *expected* sequences. Striking a flint *typically* causes a spark, but sometimes it does not. Sometimes maskers are to blame. Recall

that, according to Bird, a masker is something that has the effect of “breaking the causal chain leading to r , so that r does not in fact occur” (pg. 228).

It is natural, although somewhat problematic, to interpret Bird’s claim as providing a definition:

A masker =_{df} Something that has the effect of breaking a dispositional causal chain, thereby preventing the manifestation.

I say that the definition is “somewhat problematic” because it relies on the vague notion of *breaking* a causal chain. There are different senses of *breaking*, and not every sense corresponds to masking. So, the definition needs to be clarified. One must explain *which* ways of breaking a causal chain are attributable to a masker.

My strategy for clarifying the relevant sense of breaking is to distinguish masking from two other forms of disruption — *finking* and *passive prevention*. These are ways of breaking a dispositional causal chain that do *not* involve a masker.

Finking is a special type of interference that involves *removing* a disposition quickly enough to prevent its manifestation. For example, if I quickly remove a glass’s fragility, I could prevent it from breaking, even if the glass were already struck. A masker, on the other hand, would *not* remove the disposition itself. It would merely prevent the manifestation. So, the difference between masking and finking lies in the process rather than the end result. Although they accomplish the same thing (stopping the manifestation), they do so in different ways: finks work by removing the relevant disposition, while maskers do not.

Passive prevention is yet a different type of interference. This involves preventing a disposition’s stimulus from ever being activated — e.g., a table passively prevents a glass from breaking by stopping it from falling. By contrast, both finks and maskers intervene once the stimulus is already underway. They are *active* (as opposed to *passive*) in the sense that they terminate a process that would otherwise lead to the manifestation.

1.2.2 Masking Defined

I will now provide a more precise definition of masking based on the previous considerations. It will have both a positive and negative component. The positive component

states that masking is a way of breaking a dispositional causal chain. The negative component states that masking is neither finking nor passive prevention. In more formal terms, our definition of masking will be as follows:

(Masking) If *o* has the disposition *D*, *M* masks *D* if and only if:

(1) *M* does not remove *D*. (**Disposition Retention Condition**)

(2) *M* prevents *o* from undergoing *D*'s manifestation by breaking *D*'s causal chain.
(**Manifestation Prevention Condition**)

(3) *o* at least partially undergoes *D*'s stimulus. (**Stimulus Activation Condition**)

We have already seen the rationale behind claims (1) – (3). The second claim captures the idea that masking involves breaking a dispositional causal chain (the positive component). The first and third claims distinguish masking from finking and passive prevention, respectively (the negative component).

1.3 Two Theses about Masking

With this working definition, we can turn our attention to the central issue. We can ask, “How does masking work?” Our definition is consistent with a number of theories. Consider, for example, the *Stimulus Activation Condition*, which explains that masking involves at least partial activation of the disposition’s stimulus. This condition is consistent with two (mutually exclusive) possibilities:

- *Hypothesis One*. The object fully undergoes *D*'s stimulus. (The masker works by disrupting other parts of the causal chain that would otherwise lead to *D*'s manifestation.)
- *Hypothesis Two*. The object merely partially undergoes *D*'s stimulus. (The masker works by preventing it from *fully* undergoing *D*'s stimulus.)

The difference has to do with *when* the masker breaks a dispositional causal chain: either *before* the stimulus is completed or *after*. (In other words, the masker either prevents the full stimulus, or it does not.) Let us call the first hypothesis the **antidote hypothesis**, and the second hypothesis the **stimulus prevention hypothesis**.

If masking works via the antidote hypothesis, this spells trouble for the conditional analysis; however, if it works via the stimulus prevention hypothesis, it does not. Take any masking case in which object *o* is disposed to *M* when *S*. If the antidote hypothesis is true, then (1) *o* fully undergoes *S*, but (2) *o* does not undergo *M*. On the standard semantics for counterfactuals, both (1) and (2) imply that ‘if *o* were to undergo *S*, it would be *M*’ is *false*. This is bad for the conditional analysis. But notice that the stimulus prevention hypothesis does not have this implication. If the masker prevents *o* from undergoing *S* (partially), then ‘if *o* were to undergo *S* (fully), it would be *M*’ might still be *true*. Therefore, masking poses a threat to the conditional analysis only if we accept that the antidote hypothesis is true.

For the rest of this essay, I will consider arguments that aim to support the antidote hypothesis over the stimulus prevention hypothesis and argue that none of them are very convincing. If none of them are convincing, then we have little or no reason to prefer one hypothesis to the other. The general implication is that those who use masking to challenge the conditional analysis have more work to do. They need to provide sufficient reason to adopt the antidote hypothesis over the stimulus prevention hypothesis.

Given these two hypotheses, there are two possible views about the nature of masking. On the *uniformity view*, either the antidote hypothesis is true for all masking cases, or the stimulus prevention hypothesis is true for all masking cases. On the *mixed view*, the antidote hypothesis is true for some masking cases, and the stimulus prevention hypothesis is true for others. For my purposes, it does not matter which view is adopted. What I aim to show is that there is no principled reason for adopting one hypothesis over the other — either in general *or* in any particular case. Therefore, the arguments here should not depend on either the uniformity view or the mixed view of masking.

1.4 The Shared Stimulus Argument

One way to justify the antidote hypothesis is to argue that it follows from some feature of masking. What might this be? In *Dispositions and Antidotes*, Alexander Bird (1998) suggests one possibility. He imagines a sorcerer who protects a fragile glass by preventing it from shattering. If the glass were ever struck, the sorcerer would follow each fracture, quickly repair it, and prevent the glass from falling to pieces. What is important about this case is that the disposition to shatter and the disposition to fracture are both triggered by the same event —

being struck. This seems to suggest that they have the same stimulus. If they have the same stimulus, then a fairly simple argument presents itself:

1. The disposition to fracture and the disposition to shatter share a stimulus.
2. For any two dispositions (D and E) that share a stimulus, x fully undergoes D 's stimulus just in case x fully undergoes E 's stimulus.
3. The glass fully undergoes the stimulus for the disposition to fracture.
4. Therefore, the glass fully undergoes the stimulus for the disposition to shatter.

Call this the *shared stimulus argument*. If it were sound, it would confirm the antidote hypothesis in at least one particular case. Not only this, but the argument provides a principled reason for its conclusion. Each premise is either plausible or demonstrably true. Premise three is true by stipulation — the sorcerer does not interfere with the disposition to fracture.

Premise two is a logical principle that I call the *shared stimulus effect*. It is fairly easy to prove. Let $Fxy = x$ fully undergoes stimulus y . According to the substitution property of identity, if $a = b$, then $Fxa \equiv Fxb$. By substituting D 's stimulus for a and E 's stimulus for b , we arrive at premise two.

Since premises two and three are true, the argument's soundness rests on premise one. This premise is at least plausible, because the disposition to fracture and the disposition to shatter are triggered by the same event. Intuitively, the stimulus for a disposition is an event that triggers its manifestation. Since the event that triggers both the disposition to fracture and the disposition to shatter is one and the same (*being struck*), there is at least *prima facie* reason to accept premise one.

1.5 Responses to the Shared Stimulus Argument

If successful, the shared stimulus argument would establish that the antidote hypothesis is true in at least a limited range of cases — i.e., those cases in which there is a shared stimulus between the masked disposition and an unmasked disposition. But I argue that the argument is *not* successful, for two different reasons. First, it is not clear that the sorcerer masks the disposition to shatter. The sorcerer might instead prove to be a fink. Although Bird provides an

argument to the contrary, in section 1.5.1, I respond to this argument and explain how I find it to be unsound.

The second reason the argument is unsuccessful is due to premise one. Although this premise is initially plausible, I believe it does not hold up to further scrutiny. In other words, the claim that the disposition to fracture and the disposition to shatter share a stimulus is not sufficiently supported. It is supported by the (hidden) assumption that if two manifestations are involved in the same causal chain, they have the same stimulus. But this assumption will prove to be false. In addition, if the disposition to fracture and the disposition to shatter have the same stimulus, then a certain difficulty seems to arise related to the *entailment thesis*. I address both difficulties in section 1.5.2.

1.5.1 First Objection to the Shared Stimulus Argument

The first objection to the shared stimulus argument questions the underlying assumption that the sorcerer is masker. The sorcerer might instead prove to be a fink. Recall that finking is distinct from masking: the former involves removing the disposition, whereas the latter does not. So, if the sorcerer is not a masker, then Bird's thought experiment is not a masking case, which means that it could not support the antidote hypothesis.

Bird responds to this worry by arguing that the sorcerer is a masker, because the disposition to shatter and the disposition to fracture share a *causal basis*. A causal basis is a property (or complex of properties) that confers a disposition on its object. For example, a causal basis of fragility might be the property of having a certain microstructure — if an object has that microstructure, then it is fragile. Having a causal basis is sufficient for having a disposition. Thus, if the glass retains the *causal basis* for shattering, it must also retain the *disposition* to shatter. This, in turn, would show that the sorcerer is not a fink since the disposition would not be retained in the presence of a fink.

The key premise in Bird's argument is that the glass retains the causal basis for shattering. Why think this premise is true? Bird's strategy for defending this premise is to argue that the glass clearly retains a different causal basis: the causal basis for *fracturing*. He provides the following argument:

If the sorcerer, acting very swiftly, follows each spreading fracture and repairs it a fraction of a second after it occurs, then although each of them occurs as it would in the normal case, the fractures do not all persist long enough for the glass to fall apart. We cannot say in this case that the causal basis of the shattering has been removed, since the causal basis for shattering is the same as the causal basis for fracturing, and that, *ex hypothesi*, remains. (Bird, 1998, pg. 230)

In short: the glass retains the causal basis for shattering because it retains the causal basis for fracturing, and the two causal bases are identical. If this argument is sound, it would constitute a defense of the assumption that the sorcerer is a masker. I take it that the argument has initial plausibility because fracturing usually leads to shattering. This provides grounds for thinking that the two causal bases are the same.

My objection to this argument is that the causal basis for shattering is *not* identical to the causal basis for fracturing. As a counterexample, imagine a special kind of glass —call it Fracture-only Glass — that is carefully designed to fracture when struck without shattering. By hypothesis, the glass is disposed to fracture but not disposed to shatter. Given that something has a disposition just in case it has a causal basis for that disposition, Fracture-only glass has a causal basis for fracturing but does not have a causal basis for shattering. Therefore, the causal basis for fracturing is *not* identical to the causal basis for shattering. If it were, then Fracture-only Glass would be impossible, which it is not.

Bird might object to my argument on the grounds that dispositions are multiply realizable – i.e., the same disposition may be realized by more than one causal basis. If that is so, then perhaps fracture-only glass has a different causal basis for fracturing from normal glass. Then, it is possible for the causal basis for fracturing in normal glass to be identical to the causal basis for shattering in normal glass, without the same being true in fracture-only glass. However, this objection is easily avoided by imagining that the causal basis for the fracturing in each type of glass is the same. The extra chemical ingredient in fracture-only glass does not interfere with the normal formation of fractures in the glass; it simply stops those fractures from leading to shatters.

Since Bird's argument relies on a false premise, it does not support the claim that the glass retains the disposition to shatter. If this claim is not supported, then it is not clear whether

the sorcerer is a masker. And, if this is unclear, then the shared stimulus argument does not clearly entail the antidote hypothesis.

Bird could respond by giving up the glass case for another case. Even if the glass case is not a masking case, that does not mean the same is true for other cases. How do we know Bird's argument will not work for a *different* case? In response, I believe that no matter the details of the case, Bird's argument will not work because it will always rely on a false premise.

There is something internally unsound about the glass argument, which we can bring to light by considering its structure:

1. If the sorcerer were a fink to *D*, then it would prevent *D*'s manifestation by removing *D*.
(Consequence of the definition of a fink)
2. Something has a disposition just in case it has a causal basis for that disposition.
(Assumption)
3. Causal basis for *D* = Causal basis for *E*. (Assumption)
4. The sorcerer does not remove the causal basis for *E*. (Stipulated by the case)
5. So, the sorcerer does not remove the causal basis for *D*. (From 3, 4. Substituting identity)
6. Hence, the sorcerer does not remove *D*. (From 2, 5. Bi-conditional elimination)
7. Therefore, the sorcerer is not a fink to *D*. (From 1, 6. Modus Tollens)

Although the argument seems valid in this form, I argue that it is unsound because premise three cannot be true. First of all, *D* and *E* must be *independent*, in the sense that something can undergo *E*'s manifestation without undergoing *D*'s manifestation. In the glass case, for example, it must be possible that something fractures but not shatters.² But if this is possible, it is also possible that something is *disposed* to *E* and not *disposed* to *D*. I assume, as Bird does, that a disposition is individuated partly by its manifestation: if there are two distinct manifestations (e.g., fracturing and shattering), there are two distinct dispositions. This leads to a contradiction with premise three, as we saw before with the glass example.

My objection cannot be easily avoided by switching to a different example, because it brings out an inconsistency in the *structure* of Bird's argument. If the sorcerer is a masker to *D* and not to *E*, then *D*'s manifestation can occur without *E*'s manifestation. But then it is possible

² Otherwise, it would not be possible for the sorcerer to prevent the shattering without preventing the fracturing.

to imagine an object (analogous to Fracture-only glass) that has *E* but not *D*. Since the object has *E* but not *D*, premise two entails it has a causal basis for *E* but not a causal basis for *D*. This contradicts premise three.

I conclude that Bird's argument is unsound. Premise three proves to be inconsistent with the other assumptions of the argument. But this means that there is no compelling reason to think the sorcerer is a masker rather than a fink, which is a pivotal assumption in the shared stimulus argument. Recall that this argument is supposed to apply to masking cases. If the sorcerer were actually a fink, then the glass case would *not* be a masking case.

1.5.2 Second Objection to the Shared Stimulus Argument

Let us assume, for the sake of argument, that the first objection is unsuccessful and that the glass case is, in fact, a masking case. I will argue that, even with this assumption, the shared stimulus argument *still* proves unconvincing, because its first premise lacks sufficient support. This is my second objection to the shared stimulus argument.

The disposition to shatter and the disposition to fracture appear to share a stimulus because they are both triggered by the same event — i.e., the striking. An event *E* triggers another event *D* just in case (a) they belong to the same causal chain and (b) *E* precedes *D*. Striking triggers both fracturing and shattering, because it precedes these events in the causal chain $\langle \textit{striking}, \textit{fracturing}, \textit{shattering} \rangle$. Since we ordinarily think of a stimulus condition as an event that triggers the manifestation, it seems to follow that the disposition to fracture and the disposition to shatter have the same stimulus. So, premise one of the shared stimulus argument seems intuitively plausible.

Although premise one has intuitive pull, I believe it lacks sufficient support for two main reasons. First, the fact that two manifestations are triggered by the same event (or implicated in the same causal chain) does not entail that their stimulus conditions are the same. For example, rubbing two sticks together leads to a rise in heat and ultimately results in an increase to my body temperature. The sticks are disposed to give off heat in response to being rubbed together. My body temperature is disposed to rise in response to heat. It does *not* follow that my body temperature is disposed to rise in response to two sticks being rubbed together. What this example illustrates is that even if two dispositions are triggered by the same event, it does not follow that their stimulus conditions are the same. Or, in other words, although the disposition to

fracture and the disposition to shatter have a common cause (striking), this does not mean they have a common stimulus.

Second, there is independently good reason to think that premise one might be false. Assume, for *reductio*, that the disposition to shatter and the disposition to fracture share a stimulus. Many philosophers accept the *entailment thesis*: disposition statements entail counterfactuals (or at least counterfactuals with a saving clause). If this is correct, then the statement ‘*The glass is disposed to shatter when struck*’ and the statement ‘*The glass is disposed to fracture when struck*’ entail the counterfactual ‘*If the glass were struck (under normal circumstances), it would both fracture and shatter.*’ But this counterfactual cannot possibly be true. Fracturing and shattering are mutually incompatible events: the glass cannot be fractured and shattered at the same time. Since the original supposition (that the stimulus for shattering and the stimulus for fracturing are the same) leads to a contradiction, we have good reason to reject that supposition.

I anticipate two responses. First, someone might suggest that ‘The glass is disposed to shatter when struck’ entails a different counterfactual — e.g., ‘*If the glass were struck, it would shatter after fracturing.*’ This removes the contradiction, because the counterfactual ‘*If the glass were struck, it would both fracture and shatter after fracturing*’ is undoubtedly true. Second, someone might deny the entailment thesis. This would also remove the contradiction, since the *reductio* argument relies on the entailment thesis.

I believe the first objection is unsuccessful because the claim ‘The glass is disposed to shatter when struck’ does not entail the counterfactual ‘*If the glass were struck, it would shatter after fracturing.*’ A glass might be disposed to shatter *without* fracturing. Suppose, for example, that a glass is carefully constructed from pieces that fit together like Legos. Although such a glass is disposed to shatter, it would not shatter *after fracturing*, because it would not fracture. If struck, the glass would shatter by each of its pieces falling out of proper alignment. I take it that the statement ‘The glass is disposed to shatter when struck’ does not entail anything about the *way* in which the glass would shatter once it is struck. Since the first objection would have us believe otherwise, it cannot be correct.

The second objection faces two challenges. First, it needs to explain why the entailment thesis is false. The thesis cannot be rejected without good reason. Second, and more seriously, rejecting the thesis still leaves a significant problem. We have seen that the disposition to shatter

has many possible stimulus conditions — most notably, there is either (a) *being struck* or (b) *being sufficiently fractured*. Both might be said to cause the disposition's manifestation. What reason is there to prefer one over the other? So far, no argument has been given to suppose that (a) is the right stimulus condition. Without such an argument, there is no principled reason to reject (b), which means there is no good reason to suppose that premise one of the shared stimulus argument is true. Putting aside the entailment thesis, one *still* has the question of how to understand the relevant stimulus condition.

Bird might respond to the concerns raised so far by pointing out that I have been focusing on only *one* possible case. There are, however, other cases, and it is possible that a different version of the shared stimulus argument (involving different dispositions) will prove to be sound. Such an argument would have the following structure:

1. Dispositions *A* and *B* share a stimulus.
2. For any two dispositions (*D* and *E*) that share a stimulus, *x* fully undergoes *D*'s stimulus just in case *x* fully undergoes *E*'s stimulus.
3. Object *x* fully undergoes the stimulus for *A*.
4. Therefore, object *x* fully undergoes the stimulus for *B*.

We are to assume that *B* is a masked disposition and *A* is an unmasked disposition, similar to the original case. And, once again, we assume that *A* and *B* are involved in the same causal chain — just as fracturing leads to shattering, *A*-ing leads to *B*-ing. The other details do not matter. As long as some version of this argument succeeds, the antidote hypothesis can be defended in at least a narrow range of cases.

In response, I believe that the problems facing the original argument also face any version of it. First, one cannot merely assume that *A* and *B* share a stimulus. Even though they are involved in the same causal chain, it does not follow that their stimulus conditions are the same. So, no matter what *A* and *B* turn out to be, an additional argument is required to support premise one. Sameness of cause does not imply sameness of stimulus.

Second, there may be independently good reason to think that *A* and *B* do not share a stimulus, based on the entailment thesis. Presumably, *A* and *B* are manifested in sequence: first *A*'s manifestation comes about (at *t*), then *B*'s manifestation (at *t*₁). Suppose, for *reductio*, that *A* and *B* have the same stimulus. Then, according to the entailment thesis, if an object were to

undergo *A*'s stimulus, it would undergo both *A* and *B*'s manifestation. But this counterfactual is false. After *A*'s stimulus, there is a gap of time separating *A* and *B*'s manifestation, during which the object does not undergo *B*'s manifestation. So, either the entailment thesis is wrong, or the initial assumption is wrong. Since the entailment thesis is independently plausible, there is more reason to reject the initial assumption, which leads us to believe that *A* and *B* do not share a stimulus.

In sum, for any relevantly similar case, we run into similar problems as compared to the original shared stimulus argument. No matter what *A* and *B* turn out to be, premise one will require more support. This should lead us to be skeptical that the shared stimulus argument can adequately support the antidote hypothesis.

1.6 The Intuition Argument

Philosophers sometimes treat the antidote hypothesis as if it is common sense or intuitively obvious. Of course, intuitions are not necessarily justified, but, at the very least, they might *help* to justify something. If intuitions do not have any justificatory weight at all, then the argument I wish to examine in this section will not even get off the ground. So, let us assume (at least for argument's sake) that the following principle, or something similar to it, is true:

(Intuition) If proposition *P* is more intuitive than its competitor *Q*, then all else being equal, *P* is more justified than *Q*.

There are many questions about how to interpret this claim — e.g., What makes one proposition “more intuitive” than another? I will not attempt to answer such questions here. My goal is not to explicate or defend *Intuition*, but rather to explore the reasons for thinking that the antidote hypothesis is more intuitive than its competitor. A precise understanding of *Intuition* is not required in order to do this.

I turn now to the *intuition argument*, which claims that the antidote hypothesis is more intuitive than the stimulus prevention hypothesis. The principle that I wish to assume for argument's sake (*Intuition*) plays a major role in this argument:

1. All else being equal, the antidote hypothesis is more intuitive than the stimulus prevention hypothesis.

2. If proposition P is more intuitive than its competitor Q , then all else being equal, P is more justified than Q .
3. Therefore, the antidote hypothesis is more justified than the stimulus prevention hypothesis.

Since we are currently assuming that premise two is true, the argument's soundness rests on premise one. This premise is usually defended using what we might call the *method of cases*. To use this method, one considers hypothetical cases in which one of two competing propositions is true: either A or B . If a certain judgment — say, that A is the case — is elicited reliably across a wide range of similar cases, this counts as evidence that A is more intuitive than B . Although there is quite a bit more to say, the important point is that the method of cases relies on there being a consensus about hypothetical cases. If no such consensus exists, then the method of cases does not yield justification.

In the next two sections, I will argue that the method of cases does not support the antidote hypothesis, because masking cases do not reliably elicit the judgment that the object fully undergoes the relevant stimulus condition. To show that this is so, I consider two masking cases discussed by Alexander Bird (1998): the *reactor case* and the *poison case*. Since the antidote hypothesis is not clearly true in these cases, there is good reason to believe that it is not clearly true in other masking cases.

1.6.1 The Reactor Case

One masking case that has received attention is Alexander Bird's (1998) *reactor case*. A nuclear reactor consists of three main parts: a uranium pile, boron rods, and a fail-safe mechanism. The uranium pile is a mass of U-235 atoms. The boron rods prevent the pile from undergoing a chain-reaction by absorbing excess energy. The fail-safe mechanism controls the boron rods and monitors the pile. If the pile gets too hot, the fail-safe mechanism kicks in and lowers the rods into the pile, thereby preventing a chain reaction. In the reactor case, the pile is prevented from undergoing a chain-reaction by the fail-safe mechanism and boron rods.

Bird claims that the reactor case is clearly a masking case because the fail-safe mechanism masks the pile's disposition to chain-react. In support, Bird points out that, even when the boron rods are lowered into the pile, "it's not as if every fissile U-235 atom has been

changed into a harmless U-237 atom” (Bird, pg. 229). The implication is that, since each atom in the pile remains fissile, the pile is always disposed to chain-react.

It has been pointed out by other philosophers that Bird’s inference is not generally valid. In other words, one cannot move from ‘Every U-235 atom in the pile remains fissile’ to ‘The uranium pile remains disposed to chain-react.’ This inference violates a principle that Gunderson (2002) calls *compositionality strictness*: the fact that *part* of an object has a disposition does not entail that the *whole* object has a disposition. So, even if each U-235 atom is fissile, one cannot infer that the pile as a whole is disposed to chain-react.

With this cautionary point in mind, let us overlook the problematic inference just mentioned. Even if the inference is wrong, the intuition might be right. Perhaps the pile is disposed to chain-react at all times, even when the boron rods are lowered into it. This might be true for reasons other than the pile’s composition. So, let us assume (at least for the sake of argument) that the fail-safe mechanism masks the pile’s disposition to chain-react.

The question now is which hypothesis — the antidote hypothesis or stimulus prevention hypothesis — is more intuitive. Using the method of cases, one must discover whether there is general consensus. Do people generally assume the antidote hypothesis or the stimulus prevention hypothesis? Figuring out the answer to this question is a task for experimental philosophy. But the problem is that, as far as I know, nobody has performed the requisite studies. So, it is currently unknown whether the method of cases would produce justification for the antidote hypothesis.

Although the requisite studies have not been done, one could make an educated guess about their probable outcomes. I predict that *neither* hypothesis would turn out to be more intuitive because the stimulus for the disposition to chain-react is not obvious. If the stimulus is not clear, then it cannot be intuitive whether or not the stimulus was satisfied. One cannot know that an event takes place if the event itself is not understood.

Someone might doubt my prediction on the grounds that the relevant stimulus *is* understood, at least by experts. Nuclear physicists, for example, might understand the stimulus based on their knowledge of physics. Moreover, when it comes to justifying a proposition, expert intuition trumps non-expert intuition (assuming the proposition falls under the domain of the expert). The thought is that, if one asks nuclear physicists, one will find a consensus regarding the antidote hypothesis, because the experts have a better understanding of the relevant stimulus.

While I agree that expertise is necessary in understanding the nature of many dispositions, deferring to expert intuition seems illegitimate in the present context for at least three reasons. (1) Knowing the physics behind a disposition does not entail knowing its *stimulus*. This relates closely to the next point. (2) Physicists are not generally trained to identify stimulus and manifestation conditions. (It is safe to say this skill – if you can even call it that – falls outside their realm of expertise.) (3) Physical theories do not pick out a unique stimulus; at best, they restrict the range of possible stimulus conditions.

The last point is particularly important, because it suggests that what we label “stimulus condition” is somewhat arbitrary. Consider, for example, the disposition to chain react. Physics describes the events that constitute a chain reaction, but it does not specify *which* events should be labeled “stimulus” for the corresponding disposition. At best, it leaves us with a number of candidates, one such candidate being the event in which the uranium pile reaches a critical mass of heat and energy. Call this event B and the set of events making up the stimulus S . Either $B \in S$ or $B \notin S$ — Which is it? Physics does not say. In fact, the whole chain reaction can be described perfectly well without even using the term ‘stimulus.’ So, it would seem that it is *up to us* whether $B \in S$ or $B \notin S$.

1.6.2 The Poison Case

The next case I want to consider is perhaps the most famous: the *poison case*. In this example, someone ingests a deadly poison and then shortly afterwards ingests an antidote to the poison. Obviously, the person does not die, due to the antidote. Bird claims that the antidote masks the poison’s disposition to cause harm. Intuitively, this seems correct: the antidote does not *remove* the poison’s disposition; it merely suppresses the disposition or holds it in check.

If we accept that the antidote is a masker, the next question is how it works. There are two possibilities: either it prevents the full stimulus from occurring or it does not. On the antidote hypothesis, the poison fully undergoes the stimulus for the disposition to cause harm. Is this an intuitive truth? It will certainly *seem* intuitive so long as we do not pay much attention to the stimulus — that is, so long as we accept that the stimulus is something like *being ingested*. If this is the correct stimulus, then a fairly simple argument presents itself:

1. Being poisonous = being disposed to cause harm when ingested.

2. The poison is ingested.
3. So, the poison undergoes the full stimulus.
4. Therefore, the antidote does not work by preventing the poison from undergoing the full stimulus.

Although the argument is clearly valid, it may not be sound. Premise one depends on whether being poisonous = being disposed to cause harm when ingested, which depends on whether the stimulus is simply *being ingested*.

A little reflection reveals that the argument is actually unsound because its first premise is false. In other words, the poison's stimulus is not simply *being ingested*. The stimulus must be more complex than this. Suppose, for *reductio*, that premise one is true: being poisonous = being disposed to cause harm when ingested. If this were true, then a very large chicken bone would be poisonous, because it is disposed to cause choking when ingested. Similarly, a very sharp object, such as a wooden stick, would be poisonous, because it would cause internal bleeding when ingested. But neither a chicken bone nor a sharp stick is poisonous. Therefore, being poisonous cannot be the same as being disposed to cause harm when ingested.

One might fear that I have been uncharitable. Perhaps it will be conceded that the stimulus is not simply *being ingested*. The first premise is obviously false, but suppose we replace it with something more plausible: being poisonous = being disposed to cause harm when *absorbed into the bloodstream*. This seems much better. A poison causes harm after entering one's bloodstream. The correct stimulus is absorption (not ingestion). So, the argument should be amended:

1. Being poisonous = being disposed to cause harm when absorbed into the bloodstream.
2. The poison is absorbed into the bloodstream.
3. So, the poison undergoes the full stimulus.
4. Therefore, the antidote does not work by preventing the poison from undergoing the full stimulus.

The revised argument has some advantages over its predecessor. It is not open to obvious counterexamples, since a chicken bone is not disposed to cause harm when absorbed into the

bloodstream. The same may be said of a sharp wooden stick. At first glance, at least, this version of the argument seems much more plausible.

While I agree that the amended argument is certainly an improvement, there are still two serious problems. First, the argument is not without counterexample. Certain unhealthy foods cause harm when absorbed into one's bloodstream, yet these foods are not poisonous. So, apparently, absorption is *part* of the relevant stimulus not the *whole* stimulus. This casts doubt on premise one. Second, if an antidote is ingested, one cannot assume that the poison is absorbed into the bloodstream. Some antidotes work by preventing absorption — activated charcoal, for example, absorbs poison from the stomach before it can be absorbed into the bloodstream. This casts doubt on premise two.

Have I still been too uncharitable? It is certainly possible to amend the argument and refine it in light of new counterexamples, with each iteration making the stimulus a bit more precise. But there is no need to consider any more amendments. I do not claim that my opponent cannot refine the argument. Rather, I claim that my opponent *needs* to refine it. By showing a need for refinement, I have shown that there is not an easy, “intuitive” justification for the antidote hypothesis. After examining what might be regarded as the intuitive options, I have discovered that they are significantly flawed. Whatever the correct stimulus turns out to be, chances are good it will be difficult to discover and thus quite unintuitive.

We have seen that in both the reactor case and the poison case, it is not clear whether the stimulus prevention hypothesis will prove to be less intuitive than its competitor. This is for essentially two reasons. First, the method of cases should be employed to find out if people are more likely to assume one hypothesis or another. But, as of yet, no studies have been performed to investigate intuitions about these cases. Second, there is reason to doubt that the antidote hypothesis is really more intuitive. In both the reactor case and poison case, it is not clear how one should understand the relevant stimulus. If the stimulus is not even clear, then it cannot be intuitive that an object fully undergoes it in any given case. The example of the poison in particular makes it especially clear how it can be difficult to come up with the correct stimulus for a disposition.

1.7 Conclusion

I have just argued that two major forms of support for the antidote hypothesis are not very convincing. The shared stimulus argument was not convincing because the alleged masking case might actually prove to be a finking case. On top of this, the argument proved to be structurally unsound as one of its premises was inconsistent with other assumptions. The intuition argument was not convincing because there is insufficient evidence for the claim that the antidote hypothesis is more intuitive than the stimulus prevention hypothesis. On the contrary, it can be very difficult to specify the stimulus for a disposition, which suggests that it is not obvious whether the poison fully undergoes the stimulus for the disposition to cause death. Although these considerations do not ultimately show that the antidote hypothesis is *false*, they do, I believe, bring it into question. The result is that one can no longer take it for granted that masking spells trouble for the conditional analysis.

CHAPTER 2

THE TRADITIONAL APPROACH TO ANALYZING DISPOSITION ASRIPTIONS

2.1 Introduction

Philosophers who provide an analysis of disposition ascriptions generally follow a strategy that consists of three stages. (1) First, disposition ascriptions are divided into two categories: canonical ascriptions and conventional ascriptions. (2) Next, canonical ascriptions are analyzed using one or more counterfactual conditionals. (3) Finally, conventional ascriptions are analyzed in terms of canonical ascriptions. I call this general strategy the *traditional approach* to analyzing disposition ascriptions.

The traditional approach faces well-known difficulties. It faces *counterexamples*, most notably *finks* and *maskers*.³ It also faces *structural problems*, including the problem of quantitative and qualitative diversity.⁴ In light of these problems, some philosophers have argued that disposition ascriptions cannot or should not be analyzed with counterfactuals.

Despite these problems, there is something very right about the traditional approach. Without a doubt, disposition ascriptions have *some* intimate connection to counterfactuals. We tend to believe, for example, that the following claims are true:

- (1) Knowing that salt is disposed to dissolve in water, I can assume that, when placed in water, salt would dissolve.
- (2) Knowing that a glass would break when very lightly tapped, I can assume that it is fragile.
- (3) Knowing that someone is virtuous, I can assume she would not steal, lie, or murder (in many different situations).

Only a philosopher would bother to question any of these claims – and usually it is only for very technical reasons. But technical issues aside, it still seems correct that disposition ascriptions and counterfactuals are closely connected.

³ Bird, 1998. Martin, 1994

⁴ Vetter, 2013

I begin this chapter with two major assumptions: (1) There are serious technical problems facing the traditional approach; and (2) There is something essentially correct about the traditional approach – namely, there is an important connection between disposition ascriptions and counterfactuals, and this can be the starting point for analysis. The two assumptions present a problem: How do you preserve what’s right about the traditional approach, without falling prey to the technical problems?

In the next chapter, I will propose a solution, which I call the *alternative approach* to analyzing disposition ascriptions. On this approach, the primary analysandum is not canonical ascriptions, but rather *single-track ascriptions*. Similarly, the secondary analysandum is not conventional ascriptions, but rather *multi-track ascriptions*. With the alternative approach, I hope to show two things: (1) We can avoid the problems facing the traditional approach; and (2) We can preserve the idea that counterfactuals play an important role in analyzing disposition ascriptions.

One might question the need for the alternative approach by questioning whether the traditional approach can be salvaged. Perhaps the technical issues are resolvable without the need for a totally different approach. In this chapter, I argue that whichever way one tries to fix the traditional approach, a significant problem awaits. By *significant problem*, I mean a problem that does not seem currently to have a good solution. If the traditional approach cannot avoid such problems, then this fact would clearly motivate a different approach.

The chapter is structured as follows. In section 2.2, I describe key terms and concepts that will appear in the following chapters. This will set the stage for section 2.3, in which I explain basic aspects of the traditional approach. Finally, in section 2.4, I describe what I take to be the most significant problems facing the approach. This serves as motivation for the alternative approach developed in chapter three.

2.2 Background: Key Terms and Concepts

In this section, I explain key terms and concepts that will appear throughout this chapter. These terms and concepts are mainly related to the idea of a *disposition ascription*. This includes the very important distinction between *canonical* and *conventional ascriptions*. After explaining the core notions, I will introduce some helpful notation for talking about disposition ascriptions

in general. My goal is that the background provided in this section will set the stage for later sections and chapters.

I begin with the most basic or primitive notion: a disposition ascription. A *disposition ascription* is any statement that ascribes a disposition to something. What it means for a statement to *ascribe* a dispositional property will not be addressed. I assume that the reader already has a good idea of which statements ascribe dispositions and which do not. It should be obvious, for example, that ‘Glass is fragile’ is a disposition ascription, whereas ‘Two plus two equals four’ is not. Granted, there is also considerable disagreement. The statement ‘Clifford is red’ may or may not be a disposition ascription, depending on whether redness is a dispositional property. Such disagreement should not concern us in this paper. It is not required that we agree on *every* disposition ascription, only that we agree on *enough* of them. I will assume without argument that we do, in fact, agree on enough of them.

Disposition ascriptions are usually sorted into two categories. Either an ascription is *canonical*, or it is *conventional* (not both). The difference has to do with the ascription’s form. Canonical ascriptions share a common form, which the following examples serve to illustrate:

- (1) ‘Salt is disposed to dissolve when *placed in water*’
- (2) ‘Glass has the disposition to break when *dropped*’
- (3) ‘The match is disposed to burn if it were *struck*’

In each example, there is an underlined term and an italicized term. I call the underlined terms *manifestation terms* and the italicized terms *stimulus terms*. The manifestation and stimulus terms correspond to a particular stimulus/manifestation pair – e.g., for the second ascription, the corresponding pair may be *dropping/breaking*.

A *canonical ascription* is simply a disposition ascription containing both stimulus and manifestation terms. Every canonical ascription can be expressed in the form ‘__ is disposed to __ when __.’ This is sometimes called *canonical form*. Thus, one could define a canonical ascription as one that sufficiently approximates canonical form. Some canonical ascriptions only approximate canonical form because they do not include a stimulus term. Such ascriptions will still count as canonical as long as the stimulus term is implicitly understood. For example, ‘Salt is disposed to dissolve’ will count as a canonical ascription as long as it implicitly means ‘Salt is

disposed to dissolve when placed in water.’ Although the stimulus term need not be present, it must at least be implied.

A *conventional ascription* is, in a certain sense, any disposition ascription that is less explicit than canonical. I will understand them mostly in a negative sense – i.e., a conventional ascription is any disposition ascription that is *not* canonical. I say that I understand them *mostly* in a negative sense because there are certain patterns among conventional forms. One pattern is that conventional predicates tend to end with the suffix ‘-ble.’ These include *soluble*, *irascible*, *flammable*, and *vulnerable*. But this is by no means a universal pattern. Many conventional dispositions do not share in this form – e.g., charged, kind, and allergic. Here are some more examples of conventional ascriptions:

- (1) ‘Glass is fragile’
- (2) ‘Donald Trump is irascible’
- (3) ‘This electron has charge.’

Notice that there is no common form. Each conventional ascription is built from a totally different predicate. For instance, the predicate ‘*has charge*’ differs from the predicate ‘*is fragile*.’ It seems that the only thing common to each example is just that it *lacks* the form of a canonical ascription.

When talking about disposition ascriptions, I often find it useful to follow a few conventions. My hope is that these conventions will make it easier to formulate various claims and arguments later on. I will employ the following conventions throughout both this chapter and the next:

- (1) *Convention One*. Whenever speaking of canonical ascriptions, I will use the standard formulation, ‘__ is disposed to __ when __.’ Remember that the second and third gaps correspond, respectively, to the manifestation and stimulus terms. These stand for particular events. The first gap corresponds to the *object term*, which stands for a particular object.
- (2) *Convention Two*. Whenever speaking of canonical ascriptions, I will use the shorthand expression ‘ $Dx_{(S, M)}$ ’ to indicate an arbitrary expression of that form. This convention is useful because I will often present general claims about canonical ascriptions. You can read this expression as follows: “For any canonical ascription of

the form ‘x is disposed to M when S,’’ The first variable (x) ranges over the object term; the second and third (S and M) range over pairs of stimulus and manifestation terms.

- (3) *Convention Three.* A similar convention also applies to conventional ascriptions. Whenever speaking of conventional ascriptions, I will use the shorthand expression ‘Dx’ to indicate an arbitrary expression of that type. Unfortunately, it is not possible to enlist the help of a predicate because conventional ascriptions do not share a common form. Despite this problem, I will still use the simple expression mentioned above (‘Dx’). You can think of ‘D’ as a placeholder for any legitimate conventional predicate or, alternatively, as a second-order variable ranging over the set of conventional predicates.
- (4) *Convention Four.* The final convention is for talking about counterfactuals. A counterfactual is a conditional of the form ‘*If X were the case, then Y would be the case.*’ I follow the standard interpretation of counterfactuals developed by Lewis and Stalnaker. Such conditionals have a special logical connective: the “box-arrow.” For example, ‘*If x were to undergo stimulus S, it would be M*’ can be represented in logical form as ‘ $Sx \Box \rightarrow Mx$.’ The box-arrow signifies that the conditional is counterfactual as opposed to indicative. Rather than write out the entire conditional each time, I will often default to the more succinct logical formulation.

These conventions will prove useful in both this chapter and the next. In section 2.3, I characterize the defining features of the *traditional approach*.

2.3 The Traditional Approach

Most analyses of disposition ascriptions in the recent literature have tended to follow a certain strategy. This strategy can be characterized in three steps:

- (Step 1) Distinguish between canonical and conventional ascriptions.
(Step 2) Give an analysis of canonical ascriptions in terms of counterfactuals.
(Step 3) Find a canonical ascription to identify with each conventional ascription.

The overarching goal of the three-step process is to be able to evaluate the truth of *any* disposition ascription (both canonical and conventional) ultimately in terms of counterfactuals. As I will argue later, I do not believe the approach is likely to succeed. But first, I will need to say more about the traditional approach itself.

The traditional approach contains essentially two analyses. The first is an analysis of canonical ascriptions; the second is an analysis of conventional ascriptions. So, each instance of the traditional approach (what I call a *traditional analysis*) will have a particular way of filling in the following schemas:

(Canonical) $Dx_{(S, M)} \leftrightarrow \dots$

(Conventional) $Dx \leftrightarrow \dots$

There are two main restrictions imposed on the analysans. For canonical ascriptions, the analysans must pick out at least one counterfactual (it may pick out more than one). This makes the traditional approach a type of *conditional analysis* and sets it apart from other approaches to analyzing disposition ascriptions.⁵ For conventional ascriptions, the analysans must be a particular *canonical ascription*. This makes the traditional approach *reductive* in the sense that it attempts to “reduce” (explain) the conventional in terms of the canonical.

These restrictions allow for a clearer picture of the traditional approach. The three steps identified before were only rough characterizations. We may now state those characterizations more clearly:

- (1) The primary analysanda are canonical and conventional ascriptions.
- (2) Canonical ascriptions are analyzed with at least one (but possibly more) counterfactual(s).
- (3) Each conventional ascription is identified with exactly one canonical ascription.

I take the traditional approach to be defined by these features. If an analysis does not satisfy all three, then it is not a traditional analysis in my sense.

Although every traditional analysis agrees on the three restrictions, they will disagree in other ways. Two important decisions will have to be made. The first decision is about *what kind*

⁵ See (Vetter, 2014) for a good example of an alternative (non-conditional) account.

of counterfactuals should appear in the analysans. Counterfactuals differ from one another by being more or less specific. For example, ‘If Ming were struck, it would break’ is less specific than ‘If Ming were struck with a hammer, it would break.’ So, the first decision is related to *specificity*. How specific are the counterfactuals in the analysans?

The second decision is related to *how many* counterfactuals should appear in the analysans. There are two extremes. In the simplest case, for each canonical ascription, there is exactly one conditional in the analysans. A famous example (which I explain later) is the *simple conditional analysis*. In the extreme case, for each canonical ascription, there are infinitely many conditionals in the analysans. An example is Manley and Wasserman’s view, which they call PROP.⁶ In-between the simple and extreme cases, there are intermediate cases. I understand an intermediate view as one that includes more than one counterfactual but fewer than infinitely many. To my knowledge, there is no actual example of such a view in the extant literature.

The first decision is related to what I call *counterfactual complexity*. This is roughly a measure of how specific a counterfactual is. The second decision is related to what I call *analytical complexity*. This is a measure of how many counterfactuals there are. Generally speaking, counterfactual complexity increases as the counterfactuals in the analysans become more specific; analytical complexity increases as they become more numerous. Since a decision must be made, every traditional theory is associated with a degree of complexity in both categories.

Because counterfactual and analytical complexity come in degrees, traditional theories can be ordered on a scale of “least” to “most” in each category. In section 2.4, I argue that varying complexity in these categories is not sufficient to avoid the problems facing the traditional approach. But in order for my argument to go through, I need an interpretation of the upper and lower bounds: What is “*least counterfactually complex*,” “*most counterfactually complex*,” “*least analytically complex*,” and “*most analytically complex*”? In the next section, I provide an interpretation on which complexity comes in three tiers: *simple tier*, *moderate tier*, and *extreme tier*. This will set the stage for the argument of section 2.4.

⁶ (Manley & Wasserman, 2011)

2.3.1 Interpreting Complexity in Three Tiers

We have already seen how it is possible to order traditional theories along two dimensions corresponding to two types of complexity. The question now is how to understand the lower and upper bounds of each scale. There are four questions:

- (1) What are the *least counterfactually* complex theories?
- (2) What are the *most counterfactually* complex theories?
- (3) What are the *least analytically* complex theories?
- (4) What are the *most analytically* complex theories?

In asking these questions, I assume that they can be meaningfully answered – i.e., there is such a thing as a “least” and “most” in each category. To see why this is so, let us first consider analytical complexity.

Analytical complexity varies as the number of counterfactuals used to analyze a disposition ascription increase or decrease. In the simplest case, there is just one counterfactual per disposition ascription. So, the *least analytically complex* theories use just one counterfactual to analyze any disposition ascription. On the other extreme, there are theories that use infinitely many counterfactuals per disposition ascription. These are what I call the *most analytically complex* theories. Finally, any theory that uses a finite number of counterfactuals greater than one falls in the *moderate* zone of analytical complexity.

Counterfactual complexity is harder to characterize because it is *relative* to the ascription being analyzed. In the simplest case, the counterfactual in the analysans is no more specific than the ascription in the analysandum. Such a theory is sometimes called the *simple conditional analysis* (or SCA, for short). SCA provides truth conditions for canonical ascriptions in the following way:

$$(SCA) D_{X(S, M)} \leftrightarrow (S \square \rightarrow M).$$

SCA is the least counterfactually complex theory, in the sense that the stimulus term (S) is no more specific than the antecedent of the counterfactual (S). For example, if the stimulus term is “when x is struck,” then the antecedent is ‘if x were struck.’ This has a further implication. Not only is SCA the simplest *counterfactually* complex theory, it also must be the simplest

analytically complex theory. If another counterfactual were used to analyze this statement, its antecedent would add detail not inherent to the ascription.⁷ In other words, increasing analytical complexity may increase counterfactual complexity.

On the other extreme – the *most counterfactually complex* theories – the counterfactuals in the analyses are *maximally specific*. This idea comes from Manley and Wasserman, who describe a maximally specific counterfactual as one that is *extremely* specific – so specific that one could not even write it down.⁸ An example is the following ascription:

(Maximally specific) ‘If Ming were struck from x angle with y degree of force at approximately z degrees Fahrenheit..., then it would break.’

We are to imagine that the ellipses are replaced by even more detail about the situation in which Ming is struck. In fact, there is so much detail that writing the whole statement down is practically impossible.

There is one final note about the most counterfactually complex theories. The term ‘maximally specific’ is deceiving. Strictly speaking, there is no such thing as a “highest” degree of specificity, because a counterfactual can always get more specific. Therefore, we should understand the term ‘maximally specific’ as picking out a certain threshold above which additional complexity is not necessary. In later sections, I revisit the question of how to set the threshold for maximally specific conditionals. For now, it suffices to say that the threshold is *high enough* such that a maximally specific counterfactual cannot be written down.

The final category is that of a *moderately complex* theory, which falls in-between the least and most counterfactually complex theories. Such theories use counterfactuals that are *more* specific than the ones prescribed by SCA but *less* specific than maximally specific counterfactuals. One example is a theory according to which canonical ascriptions should be analyzed with a saving clause. So, for example, the ascription ‘Ming is disposed to break when struck’ should be analyzed thus:

‘If Ming were struck under normal circumstances, it would break.’

⁷ I assume, of course, that the second counterfactual is different from the first.

⁸ (Manley & Wasserman, 2008)

Since the ascription does not specify the circumstances of being struck, whereas the counterfactual does, the counterfactual is more specific than the ascription. At the same time, however, it is considerably *less* specific than a maximally specific counterfactual, as is evident from the fact that it can be easily written down.

Every theorist must decide on the type and number of counterfactuals to use in the analysis. We have just seen their decision will fall into one of three categories along two separate dimensions, which I refer to as “analytical complexity” and “counterfactual complexity.” The following chart represents the relevant possibilities:

Table 1: Complexity Table

		Analytical Complexity		
		Simple	Moderate	Extreme
Counterfactual Complexity	Simple	Simple		
	Moderate	Mixed	Moderate	Mixed
	Extreme	Mixed	Mixed	Extreme

In the simplest case, there is SCA, according to which each canonical ascription is analyzed in terms of exactly one counterfactual, where the counterfactual is no more specific than the stimulus term. In the most extreme case, there is Manley and Wasserman’s proposal (PROP), according to which each canonical ascription is analyzed in terms of infinitely many *maximally specific* counterfactuals. Although other possibilities may have no defenders, they remain possibilities, nonetheless.

In the next section, I will use this framework to argue that no matter how it is formulated, the traditional approaches a significant problem. My strategy is to examine, on a case-by-case basis, each of the major possibilities and to argue that each one is faced with a significant problem. If the arguments are successful, this should motivate one to rethink how to analyze disposition ascriptions with counterfactuals.

2.4 Problems Facing the Traditional Approach

In previous section, it was established that there are seven categories into which any traditional theory will fall. In this section, I will argue that no matter in which category it falls, at least one significant problem awaits. By a “significant problem,” I mean a problem that seems to count decisively against the theory in question – the problem seems to have no satisfactory solution. My argument has just two major premises, from which the conclusion logically follows. Here is the argument in standard form:

- (1) Any way of spelling out the traditional approach falls into one of seven categories.
- (2) A significant problem faces each category.
- (3) Therefore, any way of spelling out the traditional approach faces a significant problem.

The purpose of this argument is to provide motivation for a different approach to analyzing disposition ascriptions. In chapter three, I will suggest one such alternative that rejects some basic assumptions of the traditional approach. The purpose of this chapter, however, is to set the stage by defending the above argument.

Since premise one was established in the section 2.3, the only premise in need of defense is premise two, which states that any way of spelling out the traditional approach is subject to a significant problem. Rather than presenting a problem for each distinct possibility on its own, I will group my arguments in the following way. (1) First, I will argue against the simplest possibility: the simple conditional analysis. (2) Next, I will argue against the most complex possibility: the “extreme” analysis. (3) Finally, I will argue against any analysis falling in-between these extremes. I will proceed by starting with an argument against the simple conditional analysis.

2.4.1 Against SCA

The simple conditional analysis holds that any disposition ascription can be analyzed with just a single counterfactual. As with any traditional approach, SCA is split into two different analyses. Canonical ascriptions are analyzed with a counterfactual directly:

$$(\text{SCA-Canonical}) \text{Dx}_{(S, M)} \leftrightarrow (\text{Sx} \square \rightarrow \text{Mx})$$

And conventional ascriptions are analyzed only indirectly, being identified with some canonical ascription:

$$(SCA\text{-Conventional}) D_x \leftrightarrow (\text{For some suitable } S \text{ and } M) D_x (S, M)$$

A stimulus/manifestation pair is “suitable” when it meets the following criteria. (1) First, the pair must be *characteristic* of the disposition in question. For example, *being dropped* is a characteristic stimulus of many fragile objects, such as glasses, vases, and fine china. (2) Second, a suitable stimulus/manifestation pair are *appropriate* to the context of utterance. For example, ‘*X is fragile*’ may be identified with ‘*X is disposed to break when dropped*’ in one context and with ‘*X is disposed to break when under great pressure*’ in another.

The problem with SCA is what Barbara Vetter has called the *problem of multi-track dispositions*.⁹ The rough idea is that some dispositions are multiply realizable, even holding fixed the relevant context. Take, for example, the ascription ‘Ming is fragile,’ uttered in a context in which Ming is a fragile glass. Fragility in this context is associated with at least two counterfactuals:

- (1) ‘*If Ming were dropped, it would break*’
- (2) ‘*If Ming were lightly struck, it would break.*’

Now, consider another fragile glass within the same context. Suppose they have slightly different dispositions: one glass (Ming) is disposed to break when dropped, while the other (Ping) is disposed to break when lightly struck. Although both Ming and Ping are fragile, SCA entails that this is not the case. For there are two suitable interpretations of ‘*x is fragile*’ within the given context:

- (1) ‘*x is disposed to break when lightly struck*’
- (2) ‘*x is disposed to break when dropped.*’

Whichever interpretation is taken, at least one fragility ascription that is, in fact, true will come out to be false. This is a counterexample to SCA.

⁹ (Vetter, 2013)

A defender of SCA might respond by claiming that the appropriate “context” includes the particular object to which the disposition is being ascribed. So, when it comes to Ming, only the second ascription is contextually appropriate, and when it comes to Ping, only the first ascription is contextually appropriate. The underlying assumption is that context is able to supply exactly one suitable interpretation of fragility. If so, then my argument relies on a false assumption – namely, that there are at least two suitable interpretations of fragility.

I do not believe this response is successful because it is implausible that context *always* supplies exactly one suitable interpretation of fragility. In at least some cases, more than one ascription is contextually appropriate at a time. Suppose, for example, that I tell you a particular glass is fragile. It might not be obvious from context alone whether I mean that the glass is disposed to break when dropped or that the disposed to break when handled in some other manner. My point is that context *might* fail to determine one particular ascription. In such cases, one can construct a counterexample to SCA in the way I have done with Ming and Ping. So, I conclude that the defender of SCA cannot respond to my argument by supposing that context will supply exactly one disposition ascription for fragility.

The above argument has far-reaching consequences. It not only poses a significant problem for SCA; it also poses a problem for analytically simple analyses in general. Recall that an analytically simple analysis assigns exactly one counterfactual to each disposition ascription. I claim that the following argument poses a significant problem for SCA and other analyses that are analytically simple:

- (1) There is an ascription of the form ‘ x is D ’ such that (within a given context) it has at least two suitable interpretations: ‘ x is disposed to $M1$ when $S1$ ’ and ‘ x is disposed to $M1$ when $S2$.’ (**Assumption**)
- (2) Suppose that (within a given context) O is disposed to $M1$ when $S1$, but O is not disposed to $M1$ when $S2$. (**Assumption**)
- (3) Assume, for reductio, that SCA is true. (**Assumption for reductio**)
- (4) O has $D \leftrightarrow O$ is disposed to $M1$ when $S1$ (**1 and 3**)
- (5) O has D (**2 and 4**)
- (6) O has $D \leftrightarrow O$ is disposed to $M1$ when $S2$ (**1 and 3**)
- (7) O does not have D (**2 and 6**)

(8) SCA is false. (3-7)

Premise one was already defended in the previous paragraph. Possibly, a disposition ascription (e.g. '*x is fragile*') has more than one suitable interpretation in a given context. Premise two is true by hypothesis: '*O*' refers to an object satisfying only one interpretation of '*x is D*' and not the other. From this point onward, the rest of the argument is straightforward and deductively implies the conclusion that SCA is false.

Even though the argument is deductively valid, its soundness might still come into question. Someone might object that there is a suitable interpretation of '*x is D*' that is *disjunctive*: '*x is disposed to M1 when (S1 or S2).*' For example, fragility might be identified with the disposition to break when *either* struck *or* dropped. If this were the case, then it seems that premise seven does not follow from premises two and six, which would prevent the conclusion from going through.

My response to the objection that '*x is D*' might be given a disjunctive interpretation is two-fold. (1) First, even if there is a disjunctive interpretation, it could *still* be the case that there are suitable *non-disjunctive* interpretations, which is all that is required for the argument to go through. So, the opponent would have to argue not only that there is a suitable disjunctive interpretation, but also that the non-disjunctive interpretations are *not* suitable. (2) Second, even if we grant that the only suitable interpretation is disjunctive, the analysis runs into another problem, which is that the manifestation might also have different suitable interpretations. For instance, Ming might be disposed to *shatter* when struck, while Ping might be disposed to *fracture* when dropped. Now consider the following (slightly different) version of the previous argument:

- (1) There is an ascription of the form '*x is D*' such that (within a given context) it has at least two suitable interpretations: '*x is disposed to M1 when (S1 or S2)*' and '*x is disposed to M2 when (S1 or S2).*' (**Assumption**)
- (2) Suppose that (within a given context) *O* is disposed to M1 when (S1 or S2), but *O* is not disposed to M2 when (S1 or S2). (**Assumption**)
- (3) Assume, for reductio, that SCA is true. (**Assumption for reductio**)
- (4) *O* has D \leftrightarrow *O* is disposed to M1 when (S1 or S2) (**1 and 3**)
- (5) *O* has D (**2 and 4**)

- (6) O has $D \leftrightarrow O$ is disposed to $M2$ when $(S1 \text{ or } S2)$ (1 and 3)
- (7) O does not have D (2 and 6)
- (8) SCA is false. (3-7)

This argument shows that even if the only suitable interpretations of ‘ x is D ’ are disjunctive, this is not sufficient to make SCA true. Within a given context, there may be many suitable stimulus/manifestation pairs.

Perhaps someone would object to my argument on the grounds that the only suitable interpretation of ‘ x is D ’ makes *both* the stimulus *and* the manifestation disjunctive. The suggestion would be that ‘ x is D ’ within this context has just one suitable interpretation: ‘ x is disposed to $(M1 \text{ or } M2)$ when $(S1 \text{ or } S2)$.’ However, as a general strategy, the disjunctive approach will not work. Suppose that an object is fragile* just in case (1) it is disposed to fracture when lightly struck *or* (2) it is disposed to shatter when dropped. Notice that there is no *single* counterfactual to which ‘ x is fragile*’ is equivalent. Even a highly disjunctive counterfactual (‘If x were lightly struck or dropped, it would fracture or shatter’) will not work. Possibly, an object is disposed to fracture when dropped and *neither* disposed to fracture when struck *nor* disposed to shatter when dropped. Since the truth of ‘ x is fragile*’ cannot be captured by a single counterfactual, the disjunctive strategy does not work to defend SCA.

I have just argued that SCA falters because conventional ascriptions cannot be analyzed with a single counterfactual. But it is just as important to realize that the same is true of canonical ascriptions. Many canonical ascriptions are what Vetter would call *irreducibly multi-track*. For instance, something can be disposed to break when struck, even though it is false that, if it were struck, it would break. Suppose that Ming would break only when struck with a force greater than N . Then, although Ming is disposed to break when struck, the counterfactual ‘If Ming were struck, it would break’ is false whenever Ming is struck with a force less than N . And if one attempts to specify the stimulus, a new question emerges: How hard must Ming be struck in order to have the disposition to break when struck? Vetter argues that no matter how the stimulus is specified, the ascription cannot be analyzed with just one counterfactual.¹⁰

These arguments pose a significant problem not only for SCA but also for *any* analytically simple analysis. It does not matter if the ascription ‘Ming is disposed to break when

¹⁰ (Vetter, 2013)

struck' is interpreted with a more specific conditional, for a conventional ascription can be associated with any number of specific conditionals. For example, suppose 'Ming is disposed to break when struck' is analyzed with a more specific conditional, such as 'If Ming were struck under ideal conditions, it would break.' It is *still* the case that 'x is fragile' might *not* entail this counterfactual in a given context. Another fragile object (Ping) may be fragile (in that context) without being disposed to break when struck. So, it does not matter if the counterfactual is more specific than the ascription; there is simply no way to identify *every* disposition ascription with a single counterfactual.

2.4.2 Against the Extreme View

Having shown that disposition ascriptions might fail to entail exactly one counterfactual in a given context, we can effectively eliminate the first column of the table in section 2.3.1. This leaves only the analytically moderate and extreme views to consider. Before considering the moderate view, I will examine the extreme view. On the extreme view, each disposition ascription is to be analyzed with *infinitely many* maximally specific conditionals.

To see the utility of such a view, consider a possible counterexample to the simple analysis:

(Fink) Suppose a sorcerer keeps watch over a fragile glass, such that if the glass were ever struck, then he would quickly render it non-fragile, so it would not break. Then, although it is true that the glass is disposed to break when struck, it is false that, if it were struck, it would break. Since SCA entails that the glass is *not* disposed to break when struck under these conditions, SCA must be false.

This phenomenon – called *finking* – involves something that would remove a disposition quickly enough to prevent its manifestation. It is generally agreed that finking spells trouble for the conditional analysis. But not every disposition can be finked. Manley and Wasserman claim that, if a disposition's stimulus is extremely precise, then it cannot be finked – for its stimulus *excludes* the presence of finks.¹¹ Something similar would be true of other alleged counterexamples, such as those involving reverse-finks, maskers, and mimickers. In short,

¹¹ (Manley & Wasserman, 2008)

maximally specific counterfactuals seem a useful way of avoiding would-be counterexamples to the conditional analysis.

At this point, one might wonder just *how specific* a counterfactual must be to count as “maximally specific.” Literally speaking, there is no such thing as a “most specific” counterfactual: they can always get more specific. So, a natural interpretation is that a counterfactual has to cross some threshold above which additional complexity is not necessary. But necessary for what? In an effort to answer this question, let us consider the relationship between complexity and counterexamples.

Suppose your friend tells you that a certain glass (Ming) is disposed to break when dropped. To prove your friend wrong, you drop Ming from just a quarter of a nanometer off the ground, and to nobody’s surprise, it does not break. Your friend responds by claiming that you misunderstood. What she meant was that Ming is disposed to break when dropped *from some suitable distance*. Again, you try to prove your friend wrong, although this time you drop Ming from high up onto a very soft mattress. Again, it does not break. Your friend is now getting quite irritated. Of course, these conditions were not what she had in mind, either. What she meant was that Ming is disposed to break when dropped *from some suitable distance onto a suitably hard surface*. This time, to prove your friend wrong, you wrap Ming in protective packaging and drop it from high up onto a hard-concrete surface. Unsurprisingly, the glass still does not break.

One can imagine that this back-and-forth goes on for quite some time. What does it tell us about the counterfactual entailed by ‘Ming is disposed to break when struck’ (uttered within this context)? For one, it tells us the stimulus that your friend had in mind was something much more specific than merely *being dropped*. It was more like *being dropped from a suitable distance*. But even this was not sufficient, for you might wrap the glass in protective packaging and then drop it from a suitable distance; needless to say, it still would not break. So, the stimulus must be *even more specific* – *being dropped from a suitable distance without protective packaging*. But now it is possible to imagine *yet another* confounding factor. (Perhaps a watchful sorcerer is around.) Each time your friend makes the stimulus more specific, a new confounding factor seems to emerge.

A question now arises. Will the strategy of getting specific ultimately yield a counterfactual that is free of confounding factors? Or will the strategy fail because a new confounding factor is always possible? Manley and Wasserman evidently believe that, at some

point, one will run out of confounding factors and reach a conditional whose truth is guaranteed.¹²¹³ If such a point exists, it can be used to distinguish maximally specific counterfactuals from run-of-the-mill counterfactuals. Let us call this imaginary point the *maximally specific point*.

As far as I can tell, Manley and Wasserman do not argue for the existence of the maximally specific point. But without such an argument, it is not clear that such a point even exists. Perhaps increases in specificity cannot ultimately resolve the problem of finks, because it is always possible to imagine a new fink. Undoubtedly, getting more specific *makes it harder to think of confounding factors*. But this does not mean that confounding factors are becoming less probable, with the eventual result that they become impossible. Manley and Wasserman presumably disagree. They believe that, by increasing complexity by some unit, we can decrease the probability of a confounding factor occurring. Eventually, we can become so specific that the probability reaches zero. The alleged relationship between complexity and probability of confounding factors is represented by the following graph:

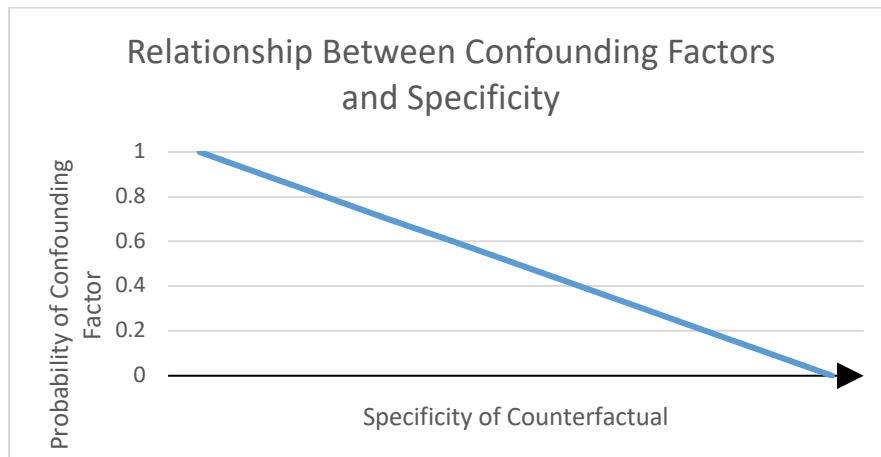


Figure 1: Relationship

The point at which the blue line intersects the black line is what I am calling the maximally specific point. If such a point exists, then maximally specific counterfactuals can be distinguished from other counterfactuals; otherwise, the whole notion of a maximally specific

¹² It is important to point out that, in the process of making a conditional more specific, we avoid making it *trivial*.

¹³ By “guaranteed,” I mean that the conditional does not leave the resulting analysis open to counterexamples like finks and antidotes. Even if the counterfactual *happens* to be true, its truth might not be guaranteed, because it would be false if there were a fink present.

counterfactual will seem arbitrary, which would create a significant problem for the extreme approach.

To my knowledge, there is currently no argument for the existence of the maximally specific point. Such an argument would show that there is a counterfactual so precise that it would be immune to possible confounding factors. Its truth would be guaranteed in the face of possible finks, antidotes, and so on. But the task of coming up with such an argument seems hopeless because there are indefinitely many possible confounding factors. Since there is a limit on how specific a counterfactual can be, it is impossible to rule out each factor simply by getting more specific. At the very least, even if these considerations do not rule out the existence of the maximally specific point, they show that there is a significant problem with the extreme approach. It relies on the concept of a maximally specific counterfactual, but it is not clear whether such a concept can do the work needed of it.

Even if this problem can be overcome, there is a second significant problem facing the extreme view. This problem arises due to the fact that the view employs an infinite number of counterfactuals in the analysis. As an illustration of the problem, I will focus on Manley and Wasserman's extreme view, which they call PROP:

(PROP) x is disposed to M when S just in case x would M in some suitable (weighted) proportion of C -cases.¹⁴

A C -case is an extremely precise stimulus involving x (Sx). Essentially, PROP tells us to consider every maximally specific conditional of the form ' $Sx \square \rightarrow Mx$.' If *enough* of these conditionals are true, then so is the disposition ascription ' $Dx_{(S, M)}$.' Otherwise, the ascription is false.

The problem raised by PROP is how to measure "proportions" of C -cases, especially given they are infinite in number. Take, for example, a fragile vase that is disposed to break when dropped. There are infinitely many highly specific dropping cases in which this object breaks, and infinitely many in which it does not break. So, how can it possibly be true that the proportion in which it *does* break is suitably large?

¹⁴ (Manley & Wasserman, 2008)

Manley and Wasserman's answer to this question seems unsatisfying. They propose an analogy with length and the number line. Five feet is greater than two feet, even though there are just as many points between one and two as there are between one and five. Even though the real number line is dense, we may still compare the sizes of different objects, conceived of as different intervals on the line. Perhaps something similar is true of C-cases. Even if the number of breaking cases and non-breaking cases are indefinite, perhaps there is a *sense* in which there are more breaking cases than non-breaking cases just as there is a *sense* in which the interval between one and five is larger than the interval between one and two. But this suggestion seems unsatisfying for the following reason. In measuring the length of objects, we use an objective measure (i.e., a measuring device) that grounds the judgment that one object is longer than another. But in evaluating whether there are more breaking cases than non-breaking cases, there is no such thing. Nothing seems to ground this judgment – except perhaps an intuition. But a mere intuition is not enough for the purposes of justification. It could just as well be the case that one's intuition about the relative size of C-cases is wrong. Therefore, Manley and Wasserman's proposal comes with a very serious difficulty: How can one determine whether an object would M in enough of the relevant C-cases?

The epistemic difficulty is made worse by the fact that descriptions of C-cases are much more complicated than descriptions about length. This complexity threatens to undermine the aptness of Manley and Wasserman's analogy. Whereas it is relatively easy to judge the relative lengths of different line intervals, it is not so easy to judge the relative sizes of different sets of C-cases. For example, suppose that Ming is a fragile vase. According to PROP, Ming is fragile if and only if it would break in a suitable proportion of highly specific dropping cases. The analysandum is true, but is the analysans? Unlike Manley and Wasserman, I am not so optimistic that one can know the truth of the analysans.

The complexity of C-cases is so great that it makes the judgment that Ming would break in a suitable proportion of dropping cases nothing more than a guess. One can appreciate the degree of complexity involved by considering cases that are much less complex than any C-case. Consider, for example, the following dropping cases:

Table 2: Sample Case

	Dropped at 5 mph	Dropped at 10 mph
Dropped from one foot	Case 1	Case 2
Dropped from two feet	Case 3	Case 4

If Ming were dropped in any of these cases (under normal conditions), in which of them would it break? Notice that (a) this is an empirical question and (b) the answer to it is not intuitively clear. But if it's not even clear whether these *simple* cases are breaking cases, how can it be clear that Ming would break in a suitably large proportion of *highly specific* cases?

I conclude that there is a significant epistemic problem for the extreme view. Given the complexity of maximally specific counterfactuals, Manley and Wasserman's judgment that a fragile thing breaks in a suitable proportion of C-cases is ungrounded. On reflection, it isn't obvious that this is true. Presumably, what would ground its truth is observation of the actual behavior of fragile objects in various cases; only after investigation can there be a reliable inference about in which cases Ming would break. Since Manley and Wasserman have not undertaken any such investigation, their claim that PROP yields the intuitively correct result in the case of fragility remains in need of support.

Let us take stock of the argument so far. I began by conceiving of traditional theories as falling into one of seven categories, based on two criteria: (1) The *complexity* of counterfactuals relative to the ascription being analyzed; 2) The *number* of counterfactuals relative to the ascription being analyzed. The seven categories were displayed in Table 1.

I then argued that the *analytically simple views* face a significant problem because some disposition ascriptions do *not* entail just one counterfactual (even holding fixed the relevant context). Next, I argued that the *counterfactually extreme views* face a significant problem because they rely on the assumption that there exists a maximally specific point, a concept that seems to rest on questionable assumptions about the relationship between complexity and confounding factors. Lastly, I argued that the *analytically extreme views* face a significant problem because there is no good way of spelling out the sense in which one set of counterfactuals is larger than another set of the same infinite cardinality. This gives rise to an epistemic difficulty of explaining how one could ever know whether (for example) something is fragile on an analytically extreme view.

2.4.3 Against the Moderate View

If my arguments have been successful so far, then the only possibility left to consider is the *moderate view*. This view attempts to avoid the problems of each extreme by falling somewhere in the middle. On the question of complexity, the moderate view holds that, at least in many cases, counterfactuals are *more specific* than the ascription being analyzed but *less specific* than maximally specific. On the question of number, the moderate view admits that more than one counterfactual may be needed, but it falls short of admitting an *infinite* number. In this section, I will argue that, although the moderate view is an improvement in some respects, it is still not immune to significant problems.

Perhaps the most immediate problem with the moderate view is *arbitrariness*. Let N = the number of counterfactuals present in the analysis. On the moderate theory, $1 < N < \infty$. This condition allows N to take many values, so it might seem that whatever its value, N is *arbitrary*. A similar worry applies to counterfactual complexity. If the counterfactuals are not simple or maximally specific, then how specific should they be? If a satisfactory rationale cannot be given for choosing a particular number or degree of specificity, then the moderate view will seem arbitrary.

One possible solution to the arbitrariness of counterfactual complexity uses counterfactuals with a *ceteris paribus clause*. A *ceteris paribus* clause is an expression to the effect that *all else is equal*. For example, something is disposed to break when struck just in case, if it were struck and *all else is equal*, it would break. The rationale behind this proposal is that, when evaluating disposition ascriptions, we implicitly hold fixed all sorts of background conditions. We assume that the laws of nature are the same as the actual laws, and we implicitly exclude sorcerers, antidotes, etc. So, the *ceteris paribus* clause is an expression used to represent that certain conditions are met when the stimulus occurs. The hope is that the *ceteris paribus* clause is specific *enough* to exclude confounding factors without being *too specific* that it pushes the analysis into the extreme category.

The difficulty with *ceteris paribus* clauses is now well-known.¹⁵ It is not clear that the *ceteris paribus* clause can be given a satisfactory interpretation. Take, for example, the claim that

¹⁵ For examples, see (Martin, 1994) and (Bird, 1998)

Ming is disposed to break when struck. On the moderate view, this ascription might be analyzed as follows:

(CP) Ming is disposed to break when struck just in case, if Ming were struck *ceteris paribus*, it would break.

If the moderate approach is to have a hope of success, however, the *ceteris paribus* clause cannot be left unanalyzed. To complete the analysis, one must know what it rules out from the antecedent set of circumstances. Giving the clause a satisfactory interpretation is a significant problem for the moderate view.

Two obvious solutions prove to fail. First, one might interpret the *ceteris paribus* clause as stipulating that there are no finks, antidotes, or other interferences of this nature. The suggestion, in other words, is the following:

(Interpretation 1) If Ming were struck *ceteris paribus* = If Ming were struck in the absence of finks and antidotes (and other things of this nature).

Bird argues that such an interpretation will result in circularity.¹⁶ It would be as if to say, “Ming is disposed to break when struck if and only if, if Ming were struck, *and if nothing were to happen making it false that Ming breaks*, it would break.” Although this statement is true, it is uninformative and defeats the purpose of analysis. A suitable interpretation of the *ceteris paribus* clause must reveal the precise nature of the excluding conditions.

The other obvious solution is to interpret the *ceteris paribus* clause as accounting for every confounding factor. This would result in a statement as follows:

(Interpretation 2) If Ming were struck *ceteris paribus* = If Ming were struck in the absence *A, B, C, etc.*

Let the set $\{A, B, C, \dots\}$ be the set of events whose occurrence would prevent Ming from breaking. Clearly, this interpretation is not trivial, since the consequent is no longer immediately implied by the antecedent. However, although it is not trivial, the second interpretation is not one that the moderate view could adopt, since it would be practically impossible to list every single

¹⁶ (Bird, 1998)

event that it would be necessary to mention. In other words, the second interpretation would transform the moderate view into an *extreme* one: the resulting counterfactuals would be too specific even to write down.

If the moderate view is to have any hope of success, there must be some third option on the table. There must be an interpretation of the *ceteris paribus* clause that avoids the problems mentioned above. Although such interpretations have been offered (e.g., Choi 2008), none of them manage completely to avoid the charge of circularity.¹⁷ But even if they do succeed, the problem of arbitrariness still applies to *analytical* complexity. It is not clear how many counterfactuals to include in the analysans. For instance, should the ascription ‘Ming is disposed to break when struck’ be analyzed with two counterfactuals, three counterfactuals, or one hundred counterfactuals?

The worry here is that whatever number one chooses will be arbitrary. But perhaps one could take a hint from Manley and Wasserman. Perhaps *x* is disposed to break when struck if and only if some *suitable* (finite) number of counterfactuals are true of it. Then the term ‘suitable’ would signify that the exact number varies depending on both the ascription and its context of utterance. This seems to be a promising strategy for the moderate approach. By modifying PROP, the idea can be summarized as follows:

(PROP*) *x* is disposed to *M* when *S* if and only if *x* would *M* in a suitable proportion of *S*-Cases.

We should understand an *S*-case as a stimulus that is more course-grained than a *C*-case: something akin to a stimulus combined with a *ceteris paribus* clause. Moreover, we should stipulate that the number of *S*-cases to consider is finite and that how many there are depends partly on the ascription and partly on its context of utterance. Because the number of *S*-cases is finite, we avoid the problem of infinite “proportions.” And because *S*-cases are not maximally specific, we avoid the conceptual difficulty raised in the previous section. For these reasons, it would seem that PROP* avoids the vices of PROP while retaining its virtues.

PROP* represents the best prospects for the moderate view. But it still suffers from at least two significant problems. First, it relies on the notion of an *S*-case, which I said before

¹⁷ See (Bird, 1998) and (Martin, 1994)

should be thought of as a more course-grained C-case. S-cases correspond to counterfactuals whose antecedents include a *ceteris paribus* clause. I already argued, however, that such counterfactuals give rise to a significant problem of their own.

The second problem has to do with the role of context in determining a “suitable” number of counterfactuals. On the moderate view, the number of counterfactuals used to analyze a disposition ascription is not constant. The exact degree of analytical complexity varies. One ascription is analyzed in terms of N number of counterfactuals; another is analyzed in terms of $N+10$. If N is not constant, then two questions emerge:

- (1) What explains the value of N in any particular case?
- (2) What explains its *change* in value?

Presumably, the defender of the moderate view will say that it changes according to the particular ascription and the context in which it is uttered. But this response is not yet sufficient. The problem of arbitrariness threatens to reemerge: if the questions cannot be given a more satisfactory answer, then N will still seem arbitrary.

Even if the problem of arbitrariness can be dealt with, the moderate approach faces a different kind of problem, which it inherits from the traditional approach more generally. Along with the simple and extreme views, the moderate view assumes that any conventional ascription is reducible to a particular canonical ascription. However, I already presented an argument against this claim. Fragility cannot be analyzed in terms of just one canonical ascription, because in certain cases context does not favor one canonical ascription over another. This makes it possible for a fragile object to satisfy one ascription but not the other. Notice that it does not matter if canonical ascriptions are linked to more than one *counterfactual*. As long as conventional ascriptions are linked to exactly one *canonical ascription*, the analysis will be open to counterexample.

2.5 Conclusion

In this chapter, I have argued that the traditional approach to analyzing disposition ascriptions is open to one or more significant problems. I conceived of the traditional approach as marked by three assumptions: (1) The primary distinction is between canonical and

conventional ascriptions; (2) Canonical ascriptions are analyzed in terms of counterfactuals; and (3) Conventional ascriptions are identified with canonical ascriptions. After exploring the different forms that a traditional analysis could take, I argued that it is bound to run into a problem for which there is currently no solution. The point of my argument was to motivate an alternative account. In the next chapter, I will lay the groundwork for such an account. My strategy will be to depart from the traditional approach by rejecting its most basic starting point for analysis.

CHAPTER 3

AN ALTERNATIVE APPROACH TO ANALYZING DISPOSITION ASCRIPTIONS

3.1 Introduction

In chapter two, I argued that the traditional approach faces at least one significant problem no matter how it is spelled out. My goal was to motivate looking for an alternative approach to analyzing disposition ascriptions. In this chapter, my goal is to present and defend one such alternative, which I call the *alternative approach*. Although this approach keeps intact the plausible idea that disposition ascriptions can be analyzed with counterfactuals, it differs from the traditional approach in at least one significant way. Whereas the traditional approach is built on the distinction between canonical and conventional ascriptions, the alternative approach distinguishes primarily between *single-track* and *multi-track* ascriptions. By the end of this chapter, I hope to have demonstrated why the latter distinction serves as the superior starting point for analysis.

In chapter two, I described the three key features of the traditional approach. (1) First, the traditional approach consists of two analyses – that of canonical and conventional ascriptions. The primary goal of analysis is to understand canonical ascriptions first and then to understand conventional ascription in their terms. (2) Second, canonical ascriptions are analyzed with at least one (but possibly more than one) counterfactual. This makes the traditional approach a type of *conditional analysis*, which is an analysis that reduces disposition ascriptions to counterfactuals. (3) Finally, for conventional ascriptions, the traditional approach identifies each one with a particular canonical ascription. For example, the ascription ‘X is fragile’ might be identified with ‘X is disposed to break when dropped.’ Together, these assumptions form the core tenets of the traditional approach.

In light of the arguments of chapter two, it would seem that one or more of the core tenets must be given up. Many are tempted to give up the second assumption – i.e., that disposition ascriptions are to be analyzed in terms of counterfactuals. But this reaction should seem very surprising, in large part because it is the most extreme. It would be to reject any sort of conditional analysis. Of course, some philosophers are happy with this result. They see the

technical problems as symptomatic of a deeper problem with understanding disposition ascriptions in terms of counterfactuals. However, I see the technical problems as just that – *technical* problems. They do not indicate a deeper problem having to do with disposition ascriptions and counterfactuals. The problem, I claim, is not with the conditional analysis but with how it has been implemented.

Rather than giving up on conditionals, which I regard as central to our understanding, I will give up the very first assumption. That is, I will reject the idea that the primary targets of analysis are canonical and conventional ascriptions. I will argue, instead, that the primary targets should be *single-track* and *multi-track ascriptions*. (Obviously, this also will have an effect on the assumption that conventional ascriptions are reducible to canonical ascriptions.) In the remainder of this chapter, I hope to make clear how radically shifting the starting point of analysis can help to avoid the problems plaguing the traditional approach.

3.2 Single-track Ascriptions

I owe the terms ‘single-track’ and ‘multi-track’ to Barbara Vetter. In the article “Multi-Track Dispositions,” Vetter distinguishes between what she refers to as “single-track” and “multi-track” dispositions (Vetter, 2013). A single-track disposition, on her view, is one that can be adequately characterized with just one counterfactual; all other dispositions are multi-track. The distinction I wish to draw is similar, except for two important differences. First, I use the terms ‘single-track’ and ‘multi-track’ to distinguish between two types of *ascriptions* – not dispositions. So, the difference between our use of the terms has to do with their different meanings:

- (a) By ‘single-track ascription,’ I mean a *disposition ascription* that can be adequately characterized with just one counterfactual.
- (b) By ‘single-track disposition,’ Vetter means a *disposition* that can be adequately characterized with just one counterfactual.

Aside from the fact that I am talking about *ascriptions*, whereas Vetter is talking about *dispositions*, what I mean by “adequately characterized” is different from what Vetter means by

“adequately characterized.” On Vetter’s view, a conditional C (of the form $Sx \square \rightarrow Mx$) adequately characterizes disposition D only if:

- (1) An object’s having D implies that, if it were to undergo S, then (*ceteris paribus*) it would be M.
- (2) If an object manifests D, then it is M (at t) and it undergoes S (at or before t).¹⁸

Vetter believes that these conditions are fairly intuitive. If an object can have D without C being true of it, then another counterfactual would be needed to explain the object’s possessing D. And if an object manifests D but did not undergo M after (or while) undergoing S, then some other counterfactual would be needed to explain the object’s manifesting D.¹⁹

On my view, a disposition ascription is adequately characterized by a single counterfactual (and, therefore, it is single-track) just in case its truth-conditions are captured by a single counterfactual. That is to say:

(Single-Track Ascription) A disposition ascription of the form ‘__ has D’ (or ‘__ is disposed to __ when __’) is single-track if and only if it is intersubstitutable with a conditional of the form ‘ $Sx \square \rightarrow Mx$.’

¹⁸ (Vetter, 2013)

¹⁹ It is a mystery to me why Vetter includes condition (2) as well as condition (1), because it seems to me that condition (1) implies condition (2). Let us assume that condition (1) is true for an arbitrary case:

(a) Ming’s fragility implies that, if it were struck (*ceteris paribus*), it would break.

And further suppose that the antecedent of condition (2) is true:

(b) Ming manifests fragility at 12:00 pm.

Given these assumptions, can it possibly be false that Ming broke at 12:00 pm and was struck at or before that time? I say that it cannot be false, because what it *means* to manifest fragility is for something to undergo the manifestation for fragility in response to its stimulus – i.e., what it means for Ming to manifest fragility is for it to break in response to being struck. The disagreement here essentially boils down to two interpretations of ‘x manifests D.’ Vetter’s interpretation has it that ‘x manifests D’ means ‘x undergoes D’s manifestation,’ which leaves open the possibility that x did not undergo D’s stimulus. My interpretation, however, has it that ‘x manifests D’ means ‘x undergoes D’s manifestation *in response to* D’s stimulus.’ If my interpretation is correct, then condition (2) is implied straightforwardly by condition (1). But why think my interpretation is correct? Imagine that Ming is a very sturdy (non-fragile) cinderblock. You take a sledgehammer and strike Ming as hard as you can. Sure enough, it breaks. Would you say Ming “manifested fragility” upon breaking? I think we would agree that it did not. However, this is precisely what we must say under Vetter’s interpretation. So, I conclude that Vetter’s interpretation has absurd consequences, which is reason to prefer my interpretation. At the very least, we must all agree that ‘manifesting D’ means more than simply ‘undergoing D’s manifestation.’

Since every disposition ascription is associated with a stimulus and manifestation term, I use the predicate ‘S’ to pick out the D-specific stimulus and ‘M’ to pick out the D-specific manifestation. Two sentences are *intersubstitutable* just in case they may be substituted for each other without a substantive change in meaning. Simply put, a single-track ascription is one whose meaning may be located in a single counterfactual.

It is important to note that *Single-Track Ascription* (STA) makes no commitment as to whether or not any disposition ascription is, in fact, single-track. It is consistent with the claim that *no* disposition ascription is single-track. So, one should not confuse STA for the *simple conditional analysis* – otherwise known as *SCA* – which states that any canonical ascription can be analyzed in terms of a single counterfactual:

$$\text{(SCA-Canonical) } Dx_{(S, M)} \leftrightarrow (Sx \square \rightarrow Mx)$$

Many philosophers disagree with SCA on the grounds that there are specific cases in which it delivers the wrong result. For my purposes, it is important to see that the falsity of SCA is consistent with the truth of STA. The latter is a much weaker thesis: it does not imply that any canonical ascription can be analyzed with a single counterfactual. It says only *what it would take* for an ascription to count as single-track.

STA helps to make clear a distinction between single-track and multi-track ascriptions that is central to the alternative approach I aim to develop. Its advantage over SCA is that it is not subject to the usual array of counterexamples and objections. But in order for STA to prove useful, there must be some ascriptions to which it actually applies. Therefore, the alternative approach must accept what I shall call the *minimal thesis*:

(Minimal Thesis) Some disposition ascriptions are single-track.

Many philosophers reject the idea that *all* ascriptions are single-track, but I do not know of anyone who rejects the idea that *some* are single-track. Nevertheless, if the minimal thesis comes into doubt, there are two possible lines of argument. There is the “natural” line and the “artificial” line. The natural line appeals to disposition ascriptions we are familiar with or apt to use in everyday life. The artificial line invents a new way of speaking that introduces single-track

ascriptions into our language. I will say something about each way of grounding the truth of the minimal thesis, although I will end up adopting the artificial line.

First, let us consider the natural way. There are at least two types of ascriptions that are reasonable candidates for being single-track. I call these *ceteris paribus ascriptions* and *extrinsic ascriptions*. A *ceteris paribus* ascription is a disposition ascription whose stimulus term is qualified with a *ceteris paribus* clause. This is a statement to the effect “all else is equal.” The ascription ‘Glass is disposed to shatter when dropped (all else being equal)’ is one example of the type of ascription I have in mind. (Note that such ascriptions need not be *explicitly* qualified, but the qualifier must be at least implicitly understood.) Some philosophers (e.g., Sungho Choi) claim that such ascriptions may be analyzed with SCA, because the *ceteris paribus* clause (suitably interpreted) may be understood to rule out confounding factors.²⁰ I do not take a stand about whether Choi is correct that there is such a suitable interpretation. My point is just that *ceteris paribus* ascriptions *might* be single-track.

The second type of ascription that might be single-track are extrinsic ascriptions. These are ascriptions that correspond to what Jennifer McKittrick has called *extrinsic dispositions*.²¹ One example of such a disposition is vulnerability. Whether a fortress is vulnerable is not a wholly intrinsic matter. For example, a fortress on a hill is not vulnerable compared to a fortress that is intrinsically the same but located in a valley. If we accept, as I do, that vulnerability is a genuine disposition, then it follows that not all dispositions are intrinsic, contrary to what some philosophers have suggested.²² We may then define an *extrinsic ascription* as one that ascribes an extrinsic disposition to an object. So, for example, ‘This fortress is vulnerable’ would be an extrinsic ascription. The reason why such ascriptions are important is because their truth-values shift as certain extrinsic properties come and go. Recall that counterexamples involving intrinsic ascriptions (such as ‘Ming is fragile’) rely on changes in extrinsic properties. Such counterexamples cannot involve extrinsic ascriptions because the presence or absence of extrinsic properties *really do* affect the truth of these ascriptions. This makes extrinsic ascriptions an especially good candidate for being single-track.

²⁰ (Choi, 2008)

²¹ (McKittrick, 2003)

²² (Lewis, 1997)

Both *ceteris paribus* ascriptions and extrinsic ascriptions are “natural” in the sense that philosophers are already familiar with them in the literature: both are already acknowledged and discussed. So, if one is looking for existing examples of single-track ascriptions, this would be a good place to start. That being said, the truth of the minimal thesis does not necessarily rest on the claim that *ceteris paribus* ascriptions or extrinsic ascriptions are single-track. We are not confined to existing linguistic expressions; new expressions can be invented when it is useful to do so.

Rather than assuming that MT can be grounded in existing linguistic expressions, I will assume that it is grounded in a new way of speaking. So, let us invent a new way of speaking right now. Consider the set of canonical ascriptions, which consists of statements of the form ‘ $Dx_{(S,M)}$.’ Call this set C . I will invent a whole new set of sentences, consisting of *single-track counterparts* of the sentences in C , as follows:

(Single-Track Counterparts) Where ‘ $Dx_{(S,M)}$ ’ is a canonical ascription in C , ‘ $\overline{D}x_{(S,M)}$ ’ is its single-track counterpart: ‘ $\overline{D}x_{(S,M)}$ ’ is intersubstitutable with a conditional of the form ‘ $Sx \square \rightarrow Mx$.’

We may now understand single-track ascriptions as counterparts of canonical ascriptions. To avoid confusion, whenever I abbreviate a single-track ascription, I will use an accent mark so that it will not be confused for a canonical ascription.

Why bother inventing a whole new set of sentences? I believe that single-track ascriptions are very useful: they are the key, in fact, to understanding disposition ascriptions more generally. I hope to show that single-track ascriptions can serve as basic building blocks for understanding more complicated and interesting disposition ascriptions (like the philosopher’s pet favorite, ‘ x is fragile’). Single-track ascriptions are a useful starting point because they are free of the technical issues plaguing canonical ascriptions. Vetter has shown that canonical ascriptions can be multi-track: such ascriptions are *not* a suitable starting point for analysis.²³ The basic building blocks need to be much simpler. You may think of single-track ascriptions as the simplest ascriptions that there are. They cannot be anything but single-track; their truth conditions are exactly that of the corresponding conditional.

²³ (Vetter, 2013)

The simplicity of single-track ascriptions brings benefits, but it also issues a challenge. How can such ascriptions figure in an analysis of disposition ascriptions that we *actually* care about? Just think about dispositions like fragility, solubility, irascibility, flammability, and the disposition to break when struck (understood in a multi-track sense). The central task for the alternative approach is to explain how simple building blocks can combine to explain the complicated and stable dispositions that are found in everyday life, science, and philosophy. I turn now to try and answer that challenge.

3.3 Multi-Track Ascriptions

Most of the dispositions that easily come to mind are multi-track: fragility, irascibility, flammability, etc. These correspond to multi-track ascriptions. I understand *multi-track ascriptions* in a negative sense: any ascription that is *not* single-track is multi-track. These are not to be confused with *conventional ascriptions*, which are importantly different. Although a conventional ascription can be (and usually is) multi-track, it can be single-track; similarly, although canonical ascriptions can be single-track, it can be (and usually is) multi-track. One should not confuse the single-track/multi-track distinction with the canonical/conventional distinction. The alternative approach is distinct from the traditional approach.

Multi-track ascriptions, by definition, cannot be characterized with a single counterfactual. This means that one cannot simply identify multi-track ascriptions with single-track ascriptions. So, if the former is to be understood somehow in terms of the latter, the relationship between the two must be more complex. In what follows, I will attempt to explain what I think that relationship is and defend my view from a few possible objections.

The essential idea is that any multi-track ascription can be explained in terms of constellations of single-track ascriptions. In the same way that atomic nuclei can form complex structures (atoms), which can form even more complex structures (molecules), single-track ascriptions can be combined to give meaning to multi-track ascriptions, which can be combined to give meaning to other multi-track ascriptions. Thus, different multi-track ascriptions can call for constellations of varying complexity.

We need to explain how the most complex ascriptions can be understood in terms of the simplest ones. For example, we need to explain how the truth-conditions of ‘x is fragile’ are grounded in counterfactuals corresponding to single-track ascriptions. My strategy for answering

this challenge is to begin with the important properties of multi-track ascriptions. Once I have described these features, I will design an analysis that aims to achieve them by combining single-track ascriptions in various ways.

Let us begin by considering two distinctive properties of multi-track ascriptions. First, unlike single-track ascriptions, multi-track ascriptions are less likely to be affected by external changes in the world. A fragile glass is not easily rendered non-fragile. I call this property *stability* and its opposite *volatility*. Single-track ascriptions tend to be volatile: at one moment it is true that something is disposed to break when dropped; at the very next moment, it is false. External circumstances are constantly changing such that objects are always gaining and losing single-track dispositions. Multi-track ascriptions, by contrast, tend to be *stable*. It remains true that glass is fragile even when it is in the presence of a sorcerer, packed into protective packaging, or dropped onto a soft mattress. So, stability is a property of ascriptions that are *resilient* (in some sense) to changes in the external world, whereas volatility is a property of ascriptions that are *susceptible* to such changes.

To determine whether a disposition ascription is resilient (or stable), you can consider the following question: “If this ascription were true, would it remain true across a large array of relevantly similar circumstances?” If the answer is yes, then the ascription is probably resilient in my sense.²⁴ Many disposition ascriptions are assumed to be stable in this sense. We assume, for example, that a fragile thing would be fragile under a wide variety of conditions, even under conditions that prevent it from breaking. So, the first thing an adequate analysis of multi-track ascriptions needs to account for is stability. It should explain how single-track ascriptions, which tend to be volatile, can combine to form stable compounds.

The second important property of multi-track ascriptions is what I call *plurality*. A disposition ascription is plural when it is associated with a bundle of conditionals, none of which by itself can ground the truth of the ascription. Take, for example, ‘Ming is fragile.’ This ascription is associated with ‘If Ming were dropped, it would break’ but also with ‘If Ming were lightly struck, it would break.’ In the appropriate context, neither conditional by itself is sufficient to guarantee the truth of ‘Ming is fragile.’ By contrast, single-track ascriptions are

²⁴ For my purposes, I leave the details aside. At this point, I do not need to give a precise understanding of how many circumstances must be considered, or in how many such circumstances the ascription remains true. Needless to say, the answers will depend partly on context, and in many cases, there will be no clear-cut answers.

always grounded in exactly one conditional. If ‘Ming is disposed to break when dropped’ is single-track, then its truth depends *only* on the conditional ‘If Ming were dropped, it would break.’

In sum, multi-track ascriptions tend to be both *stable* and *plural*. This means that they are not easily made false by external changes in the world and their truth is rarely grounded in a single counterfactual. Yet these properties are lacking in single-track ascriptions. The resulting challenge is to explain how single-track ascriptions (which are volatile and non-plural) can be combined to yield the multi-track ones (which can be stable and plural). In the next section, I will consider ways of doing just that.

3.3.1 Combining Single-Track Ascriptions

Although single-track ascriptions can be combined in multiple ways, there are two primary ways that I will focus on in this section. The first way is by *disjunction* – two or more single-track ascriptions are joined together with an ‘or.’ The second way is by *conjunction* – two or more single-track ascriptions are joined together with an ‘and.’ If single-track ascriptions are like atoms, then disjunctive and conjunctive compounds are like very simple molecules. As we will see, although these molecules are unlikely to serve as analysans on their own, they still can provide useful insight.

Suppose we wish to combine two atoms into a simple molecule. Our atoms are two single-track ascriptions:

- (1) $\bar{D}m_{(S,M)}$: ‘Ming is disposed to break when struck’
- (2) $\bar{E}m_{(S,M)}$: ‘Ming is disposed to break when dropped’

Our simple molecule will be called Fm or ‘Ming is F .’ Given only the two atoms, we can assign Fm either a disjunctive or conjunctive analysis. According to a disjunctive analysis, ‘Ming is F ’ is true just in case either $\bar{D}m_{(S,M)}$ or $\bar{E}m_{(S,M)}$ is true. According to a conjunctive analysis, ‘Ming is F ’ is true just in case both $\bar{D}m_{(S,M)}$ and $\bar{E}m_{(S,M)}$ are true.

A disjunctive analysis has the advantage of increased *stability*. Disjunctions tend to be weak claims. To say that I have either a nickel or a dime is to say something weaker than I have a nickel. The latter tells you what I have; the former does not. But an advantage of weak claims

is that they are more easily true and less easily false. Given a sufficiently diverse, finite number of situations, there are more in which the disjunction is true. Such is the case with our disjunctive analysis. If there are a finite but diverse number of situations (relevant to the truth of the ascription), then Fm is true in more of those situations than either $\overline{D}m_{(S,M)}$ or $\overline{E}m_{(S,M)}$ by itself. So, as a general rule, adding more disjuncts to an analysis is likely to increase the stability of a multi-track ascription. Highly disjunctive molecules tend to be stable.

A conjunctive analysis has the advantage of increased *plurality*. Conjunctions tend to be strong claims. To say that I have both a nickel and a dime is to say something stronger than I have a nickel. The former tells you something that the latter does not. But while these claims tend to be more easily false, when they are true, they are more informative. Our conjunctive analysis of Fm is no different. Although Fm is more volatile than either $\overline{D}m_{(S,M)}$ or $\overline{E}m_{(S,M)}$ by itself, in cases where it is true, we learn more about Ming's behavior. Many interesting multi-track ascriptions are similarly informative. If the ascription 'Ming is fragile' is true, then not only do we know it would break when dropped, we also know it would break when struck. Canonical ascriptions can be plural in the same way. If something is disposed to break when struck, it would break when struck with a hammer *and* it would break when struck with a club. The truth of disposition ascriptions often depends on a whole host of conditionals.

I have just touched on two strategies for creating compounds of single-track ascriptions. The first strategy was disjunctive. One can combine single-track ascriptions using an 'or.' Given some plausible assumptions, this strategy has the advantage of creating *stability*. The second strategy was to combine single-track ascriptions using an 'and.' The advantage of this strategy was that it could explain the plural nature of multi-track ascriptions. It could explain, for example, that fragile objects are not only disposed to break when dropped but also disposed to break when struck.

Although disjunctive and conjunctive compounds present interesting strategies for analysis, they are far too simple by themselves to constitute an adequate analysis of multi-track ascriptions. The conjunctive compound was far too volatile: it is easily subject to counterexamples like finks. The disjunctive compound was also too simple, in part because it cannot capture the full meaning of disposition ascriptions. But these simple compounds were never intended to serve as an analysis. Rather, they were meant to illustrate how our atoms can be combined to yield molecules with useful properties. The question now is whether there exists

an analysis that yields molecules suitable enough for even the most complex multi-track ascriptions like fragility.

It should be clear now that the best analysis of multi-track ascriptions will be some combination of the disjunctive and conjunctive strategies. The disjunctive strategy will provide the needed stability, and the conjunctive strategy will provide the needed plurality. In the next section, I will propose a general analysis of multi-track ascriptions that tries to incorporate both strategies. The proposal, which I call MT, goes as follows:

(MT) Any multi-track ascription of the form ‘x is D’ is true just in case there exists a D-characteristic set for which *every* ascription in that set is true of x.

I believe that MT is a suitable analysis of multi-track ascriptions. It represents instructions for combining single-track ascriptions into suitable compounds. In the next section, I will explain how one should understand the notion of a *D-characteristic set*. After that, in section 3.4, I defend the analysis from a few important objections.

3.3.2 Analyzing Multi-Track Ascriptions: D-Characteristic Sets

MT cannot be understood without first understanding the unfamiliar notion of a *D-characteristic set*. This plays a crucial role in the alternative analysis I aim to develop. As a first approximation, I will define a D-characteristic set as follows:

(DC) Where D is a multi-track disposition, a *D-characteristic set* is a finite set of disposition ascriptions that is *characteristic* of it.

This definition raises yet another question. What does it mean for a set of ascriptions to be “characteristic” of a disposition? Intuitively, a D-characteristic set consists of ascriptions that are relevant to whether an object possesses D. A fragility-characteristic set might include, for example, the ascription ‘X is disposed to break when struck’ – whether something is disposed to break when struck is relevant to its fragility. Obviously, the term “relevant” is itself in need of clarification. In this section, I will attempt to clarify DC by explaining how a set of disposition ascriptions can be *characteristic* of D.

I will begin by stating a definition. For any set of disposition ascriptions S, S is characteristic of multi-track disposition D just in case:

- (1) S consists of disposition ascriptions that are conceptually associated with (tied to/connected with) the dispositional concept related to D.
- (2) S can serve as a sufficiency test for whether an object has D.
- (3) S survives a process of hypothetical scrutiny.

When S satisfies these conditions, S is *characteristic of D* in my sense of the terms. Although I want to focus mainly on condition three, since it is perhaps the most unclear, I will need to say something about conditions one and two.

I take it as a basic fact about multi-track ascriptions that they are conceptually tied to other disposition ascriptions. A very clear example of this involves fragility. Upon learning that a glass is fragile, you believe it is disposed to break when struck. Your belief is not based on anything you observe about the glass; it is based on an *understanding* of fragility. From “Ming is fragile,” you are likely to infer “Ming is disposed to break when struck” in the same way you infer “triangle” from “three-sided polygon.” In some cases, however, the conceptual leaps are not so effortless or obvious. Only those with a knowledge of physics, for example, know the implications of the claim “Electrons are negatively charged.” Finally, in other cases, the conceptual ties merely *seem* obvious but later prove to be less clear upon reflection. Cases involving finks and antidotes often bring this complexity to light.

Whether ascertained through intuition, learning, or reflection, the conceptual ties that exist between multi-track ascriptions and dispositions is the basic starting point for the present analysis. As the starting point, there are a number of foundational issues raised, which I will not get into. This includes (but is not limited to) the nature and epistemology of concepts and conceptual association. Since my focus is not on concepts or their relations but on the proper analysis of multi-track ascriptions, I will say very little about the foundational issues raised by condition one. What I will say, therefore, is limited to the following observations:

- (1) The conceptual tie or association at issue is usually formed organically as concepts evolve over time. The exceptions to this are concepts formed artificially through

- invention or explication. Dispositional concepts found in the sciences often are of this artificial nature, while those found in ordinary life (such as Fragility) often are not.
- (2) Concepts can be “messy” in two senses. (1) They can admit of indeterminacy, and (2) they can resist attempts at strict definitions.
 - (3) Conceptual associations will often come fairly easily to mind. (This is the case with fragility, for example, which we easily recognize as being associated with the disposition to break when struck.) When the connections are not obvious, however, one may have to consult the experts – those who possess the relevant dispositional concept. Sometimes, when the connections are not obvious, reflection is necessary to uncover the true connections.

With these observations, one can see how it can be difficult to arrive at an adequate D-characteristic set for a disposition. Oftentimes, the conceptual connections that join together D and some set of disposition ascriptions will not be obvious or will come under scrutiny. This problem is only made worse because concepts can be “messy,” so it is not always clear whether a concept applies to a given case. My analysis is built to account for these difficulties with conditions two and three, to which I now turn.

Condition two states that S can serve as a sufficiency test for whether an object has the relevant disposition. A *sufficiency test* corresponds to a sufficient condition. Being a human being, for example, is a sufficiency test for being an animal. If one is a human being, then one is an animal. Similarly, the elements of S jointly constitute a sufficiency test for having disposition D.²⁵ If each element of S is true of x, then the multi-track ascription ‘x has D’ is true.^{26 27} Importantly, however, whether S *counts* as a sufficiency test depends on whether it passes condition three – that is, on whether it survives hypothetical scrutiny. Not just any set of disposition ascriptions associated with D is a sufficiency test for D. On my view, the sufficient ones must pass a kind of test, which I call the *test of hypothetical scrutiny*. With this in mind, let us turn our attention to condition three.

²⁵ Since multi-track ascriptions typically have more than one D-characteristic set, they typically have more than one sufficiency test. For example, fragile bricks will satisfy a different set of sufficiency conditions from fragile glasses.

²⁶ The reverse, however, does not follow from a sufficiency test – i.e., if some element of S is false of x, it does not follow that ‘x has D’ is false.

²⁷ Since S is finite, sufficiency tests are also finite. One does not need to consider an infinite number of ascriptions to determine the truth of a multi-track ascription. To determine whether something is fragile, for example, one does not need to consider every ascription that is associated with fragility. One only needs a select few.

The test of hypothetical scrutiny is a procedure for finding a set of ascriptions that can serve as a sufficiency condition for a multi-track ascription. The procedure I will develop here is inspired by the one that Rudolph Carnap (1955) develops for determining the intension of a predicate.²⁸ Since I draw heavily from Carnap, I will say a bit about his method for determining intension before moving any further in the discussion.

First of all, the *intension of a predicate* is roughly the general condition that an object must satisfy in order for the predicate to apply to it.²⁹ For example, the intension of ‘dog’ is the general condition that an object must satisfy to count as being a dog. This can be contrasted with the *extension of a predicate*, which is simply the set of actual objects to which the predicate applies. The extension of ‘dog’ is the set consisting of all and only dogs.

In his paper ‘*Meaning and Synonymy in Natural Languages*,’ Carnap outlines a “behavioristic, operational procedure” for determining the intension of a predicate.³⁰ His opponent is Quine, according to whom intensions (unlike extensions) are not scientifically respectable because there are no empirical criteria for them. Against this position, Carnap argues that scientists can determine intension in much the same way they determine extension. Here is Carnap’s example of an empirical method for determining extension:

“We take as example the German language. We imagine that a linguist who does not know anything about this language sets out to study it by observing the linguistic behavior of German-speaking people. More specifically, he studies the German language as used by a given person Karl at a given time. For simplicity, we restrict the discussion in this paper mainly to predicates applicable to observable things, like ‘blau’ and ‘Hund.’ It is generally agreed that, on the basis of spontaneous or elicited utterances of a person, the linguist can ascertain whether or not the person is willing to apply a given predicate to a given thing, in other words, whether the predicate denotes the given thing for the person. By collecting results of this kind, the linguist can determine first, the extension of the predicate ‘Hund’ within a given region for Karl, that is the class of things to which Karl is willing to apply the predicate, second, the extension of the contradictory, that is, the class of those things for which Karl denies the application of ‘Hund,’ and, third, the intermediate class of those things for which Karl is not willing either to affirm or to deny the predicate” (Carnap, 1955, pg. 35-36).

The method for determining extension involves observing whether someone is willing to apply a predicate to a given case. Obviously, things are not quite so simple. One assumes, for simplicity,

²⁸ (Carnap, 1955)

²⁹ (Carnap, 1955)

³⁰ (Carnap, 1955)

that the predicate applies to an observable thing – like ‘blau’ or ‘Hund’ – and that the agent is honest, well-informed, reasonable, etc. Despite these difficulties, the general point remains the same: one can discover the extension of a predicate by observing whether idealized agents are willing to apply that predicate to a wide range of actual cases.

Suppose a scientist, using Carnap’s method, determines that the extension of ‘Unicorn’ and ‘Goblin’ are both empty. There is no object in the actual world to which someone like Karl is willing to ascribe these predicates. On Quine’s view, no additional empirical investigation would further one’s knowledge about the meaning of these predicates. The fact that they are defined differently is just a matter of convention. There is no *right* choice (strictly speaking) as to how one chooses to define them.

I take it that Quine’s view will strike one as unintuitive. Although ‘Unicorn’ and ‘Goblin’ have the same extension, there is a fact of the matter regarding their correct definitions – a fact that *can* be discovered empirically. But this raises a certain challenge. How can a scientist verify that the intensions are, in fact, different? A scientist cannot present anybody with actual cases of unicorns or goblins because they do not exist. So, it might seem as though there is no empirically discoverable difference.

Carnap answers this challenge by providing an empirical method for determining intension. The scientist will not discover a difference between ‘Unicorn’ and ‘Goblin’ so long as she limits herself to actual cases. In addition to actual cases, the scientist must observe responses to *possible cases*. Although possible cases may not be actual, there are still empirical methods to investigate them. For instance, a scientist can describe a possible situation in which there exists a mythical, horse-like creature with a single horn on its head. The predicate ‘Unicorn’ clearly applies to this case, while the predicate ‘Goblin’ clearly does not. Therefore, a competent speaker is disposed to ascribe ‘Unicorn’ and to deny ‘Goblin.’

Notice that the procedure for discovering intension is essentially the same as that of discovering extension. The difference is that, when considering intension, all logically possible cases become relevant. Based on responses to these cases, one can construct a reasonable hypothesis and test it (at least in theory) against observation.

Carnap’s method for discovering intension suggests a sort of test. If you believe that something belongs to the intension of a predicate, you can test whether you are correct by observing responses to possible cases. What I am now suggesting is that the same sort of test be

used to determine whether a set of disposition ascriptions (S) counts as a sufficiency test for disposition D. Roughly, the idea is that D-characteristic sets can be discovered by empirical investigation of the kind Carnap had in mind. A scientist can present subjects with possible cases and use their responses to formulate a hypothesis, which she might go on to test and refine in light of new evidence.

Let me make this idea more explicit. Suppose a scientist is investigating whether a certain set of ascriptions {D1, D2, D3} constitute a D-characteristic set for Karl. The scientist presents Karl with different possible cases in which an object satisfies D1, D2, and D3. If the scientist can find a case in which the object satisfies all three, but Karl does not ascribe D to that object, then the set is not characteristic of D (for Karl). If Karl does ascribe D to the object under these conditions, then the scientist can be more confident that {D1, D2, D3} constitutes a D-characteristic set.³¹ In this way, the scientist can determine which ascriptions are likely to be sufficiency tests for D.

There is one important difference between Carnap's procedure and my own. Whereas Carnap's procedure involves logically possible cases, my procedure involves only *physically possible* cases. The only cases relevant to whether something is fragile are those in which the actual laws of nature obtain. Similarly, the only cases relevant to whether something is fragile are those in which the object has the same intrinsic properties as it actually has. Thus, there are two restrictions on the possible cases presented to Karl: (a) the cases must hold fixed the actual laws of nature and (b) the cases must hold fixed the actual intrinsic properties of the object in question.

I am now in a position to state the test of hypothetical scrutiny more explicitly. Suppose that 'D' stands for a multi-track disposition; 'S' stands for a set of ascriptions associated with it. Then, S survives the test of hypothetical scrutiny if and only if:

(Test of Hypothetical Scrutiny) Whenever the ascriptions in S are true of an object (X) in a relevant physically possible case, an idealized agent is disposed to judge that X has D.

We assume that an idealized agent is similar to Karl in Carnap's example. Among other things, an idealized agent is a competent reasoner, honest, and appropriately free to speak her mind. We

³¹ Perhaps not certain because there are many more cases that may need to be tested.

also suppose this agent possesses the relevant dispositional concept and that he is knowledgeable and well-informed.

Here is an example of how the test of hypothetical scrutiny would work. Let us take, as an example, a fragility-characteristic set. The question is whether the following two ascriptions can act as a sufficiency test for fragility:

- (1) $\overline{D}m_{(S,M)}$: ‘X is disposed to break when struck’
- (2) $\overline{E}m_{(S,M)}$: ‘X is disposed to break when dropped’

I argue that the test of hypothetical scrutiny reveals that the set $\{\overline{D}m_{(S,M)}, \overline{E}m_{(S,M)}\}$ is *not* characteristic of fragility. Although it may pass the first condition (each member of the set is conceptually tied to Fragility), it fails the other conditions: there is a physically possible case in which these two single-track ascriptions are true of X, but an idealized agent is not disposed to judge that X is fragile. An example is a case in which X is a very sturdy cinderblock. We may assume there are two salient features of the case. (1) The block is disposed to break when struck, because it would break if struck with a sledgehammer; (2) The block is disposed to break when dropped, because it would break if dropped from 5,000 feet onto a steel surface. Needless to say, such a block would not count as fragile.

It is not surprising that a set consisting of two single-track ascriptions did not pass the test. This is, in fact, what we would expect for a disposition like fragility. One can go on to refine the analysis in a variety of ways. One could get more specific: one could explicitly rule out the unwanted scenarios by getting more precise. The single-track ascription ‘X is disposed to break when struck’ may be substituted with the more precise ‘X is disposed to break when *softly* struck.’ Similarly, the single-track ascription ‘X is disposed to break when dropped’ may be substituted with the more precise ‘X is disposed to break when dropped *from short distances*.’ If the test is still not passed, then the specifications can continue.

Another strategy is to include *other* multi-track ascriptions in the set. Multi-track ascriptions can be, and quite often are, characteristic of other multi-track ascriptions. Arguably, when one asserts that the disposition to break when struck is associated with fragility, one has in mind not some *single-track* disposition but a multi-track one. If the disposition to break when struck is multi-track, then it’s not clear that the cinderblock is disposed to break when struck.

This would be the case *only if* the cinderblock were to satisfy every ascription in some striking-characteristic set. But perhaps the ascription ‘X is disposed to break if struck with a sledgehammer’ is not part of any striking-characteristic set. Or perhaps for any striking-characteristic set, there is at least one ascription that the cinderblock fails to satisfy. Either way, at the very least, the multi-track ascription is not obviously true of the cinderblock whereas the single-track ascription *is* obviously true of it.

3.3.3 Analyzing Multi-Track Ascriptions: Recap

I have just explained how I understand the idea of a *D-characteristic set*. Now I think it will be helpful to pause and summarize the ground covered thus far. I began with the idea of a D-characteristic set, which was defined (roughly) as a set of ascriptions that is *characteristic* of D. In an effort to make this definition more precise, I claimed that D-characteristic sets have three defining features: (1) each member of the set is conceptually tied to D; (2) the members jointly constitute a sufficiency test for D; and (3) the members jointly pass the test of hypothetical scrutiny. The test of hypothetical scrutiny was inspired by Carnap’s method for determining the intension of a predicate. The test is based on the hypothetical responses of idealized agents to physically possible cases.

With these ideas in place, we can return to the overarching analysis of multi-track ascriptions. Recall my previous statement of the analysis:

(MT) Any multi-track ascription of the form ‘x is D’ is true just in case there exists a D-characteristic set for which *every* ascription in that set is true of x.

While the idea of a D-characteristic set provided us with a *sufficiency condition*, MT provides us also with a *necessary condition*. What is necessary for the truth of ‘X is D’ is the truth of every disposition ascription in *at least one* D-characteristic set. In other words, if ‘X is D’ is true, then one can find a D-characteristic set that “works” for X. With both necessary and sufficient conditions, this completes the analysis of multi-track ascriptions.

I said before that one should think of MT as instructions for creating constellations of single-track and multi-track ascriptions. It has both a disjunctive and a conjunctive nature, which accounts for stability and plurality, respectively. The disjunctive nature lies in the possible

existence of more than one D-characteristic set. Among these sets, *only one* is needed to ground the truth of a multi-track ascription. The conjunctive nature lies in the possible existence of more than one ascription *within* a D-characteristic set. This explains why some multi-track ascriptions are grounded in not just a single counterfactual but a bundle of counterfactuals. The dual nature of my analysis gives it both flexibility (accounting for stability) and structure (accounting for plurality) where they are needed. At the same time, my analysis is not too restrictive in imposing any one particular structure. It allows for dispositions that have exactly one D-characteristic set (i.e., a simple conjunctive compound), and it allows for dispositions whose D-characteristic sets have exactly one member (i.e., a simple disjunctive compound). At the other extreme, my analysis allows for *infinitely many* D-characteristic sets, and it does so *without* requiring an individual to make judgments about the relative sizes of different infinities. (It is important to remember that D-characteristic sets themselves must be finite.) I believe that these qualities give my analysis an advantage over more traditional ones. In the next section, I will examine the usual problems that are raised against the traditional approach and argue that they do not trouble the alternative.

3.4 Objections and Responses

Philosophers have raised a number of pressing objections against the traditional approach. I will group these objections into two general categories: (1) *Counterexamples* and (2) *Structural Problems*. The first category captures objections that aim to show that a particular analysis succumbs to one or more counterexamples. Such counterexamples can involve finks, reverse-finks, antidotes (or maskers), mimickers, and Achilles' heels. The second category captures objections of a more general nature. These objections aim to show that, irrespective of counterexamples, the traditional approach fails because it rests on one or more faulty assumptions. In this section, I aim to show that neither type of objection is an immediate threat to the alternative approach I have put forward. This is a good reason to prefer the alternative approach over the traditional one.

3.4.1 Counterexamples

Philosophers have come up with an eclectic variety of cases that seem to constitute counterexamples to the traditional approach. This includes everything from *finks* and *antidotes* to *mimickers* and *Achilles' heels*. Although qualitatively distinct, the cases are singular in purpose: to demonstrate that a set of conditions either is not necessary or is not sufficient for the truth of a disposition ascription.

I will consider six possible counterexamples to the alternative analysis using a pair of imaginary objects called “Weak” and “Sturdy.” Weak is a very delicate glass vase, and Sturdy is a very sturdy cinderblock. The relevant context, which I hold fixed throughout, is the stereotypical one for fragility – roughly, that of fragile glasses, vases, and fine china. In this context, only Weak is fragile; Sturdy is not.

There are a few things to note about how I present the counterexamples. (1) Although the examples involve imaginary, fanciful things like sorcerers and spells, similar counterexamples can be constructed without such devices. The counterexamples need not involve any particularly unusual entities. (2) I will present six cases in total, but there are only three *types*. Each type has two different versions (corresponding to Weak and Sturdy) depending on whether the counterexample goes against a necessary or sufficient condition. (3) These counterexamples are typically offered as reasons for rejecting the traditional approach, especially the simple conditional analysis:

$$\text{(SCA-Canonical) } D_{X(S, M)} \leftrightarrow (Sx \square \rightarrow Mx)$$

$$\text{(SCA-Conventional) } D_X \leftrightarrow D_{X(S, M)}$$

Counterexamples are offered directly against SCA-Canonical or (more commonly) indirectly through SCA-Conventional. In any case, finking, masking, and reverse-heels all aim to show that a given counterfactual is not *necessary* for the truth of a disposition ascription, while reverse-finking, mimicking, and Achilles heels aim to show it is not *sufficient*. Let us consider each pair in the order presented.

3.4.1.1 Finking/Reverse-finking. The first pair of cases is called “finking” and “reverse-finking.” A *fink* is something that joins with a disposition’s stimulus to remove the disposition

quickly enough to prevent the object from undergoing its manifestation. Suppose, for example, that a protective sorcerer casts a spell on Weak that would render it non-fragile whenever it is struck. The sorcerer's spell acts very quickly – so quickly, in fact, that it would remove the glass's fragility before it breaks. Even though Weak is fragile, it is not disposed to break when struck: if it were struck, the sorcerer would intervene and remove its fragility. Therefore, 'Weak is fragile' does not imply 'Weak is disposed to break when struck.' This shows that the truth of the counterfactual ('If Weak were struck, it would break') is not *necessary* for the truth of the ascription.

Reverse-finks are similar to finks except that they challenge the *sufficiency* of the counterfactual. These are like the mirror images to finks. Instead of removing a disposition, a reverse-fink joins with a disposition's stimulus to *give* an object a disposition, which, in turn, causes the object to undergo its manifestation. For example, a devious sorcerer casts a spell on Sturdy that would render it fragile whenever it is struck. The sorcerer acts quickly enough to cause the cinderblock to break in any circumstance in which it is struck. Although Sturdy is not fragile, it would quickly become fragile due to the sorcerer's spell. Thus, even though the counterfactual ('If Sturdy were struck, it would break') may be true, it does not follow that Sturdy is fragile.

3.4.1.2 Masking/Mimicking. Not every counterexample involves changing the intrinsic properties of an object. An *antidote* (or *masker*) is exactly the same as a fink, except that it does remove the object's disposition.³² For example, a protective sorcerer might cast a shielding spell on Weak to prevent it from breaking whenever it is struck. We may stipulate that the spell does not remove Weak's fragility. It merely stops the stimulus (striking) from leading to the manifestation (breaking). The end result is the same. Although Weak is fragile, the counterfactual 'If Weak were struck, it would break' is false. This goes against the necessity of the counterfactual.

As one might guess, a *mimicker* is exactly the same as a reverse-fink, except that it does not actually *give* the object a certain disposition. Rather, it causes an object to behave the same way that an object with that disposition would behave. For example, a sorcerer might cast a

³² This is one way of understanding masking, but it is not the only (or even the best way). Elsewhere, I argue that there is another, equally good way of understanding this phenomenon.

breaking spell on Sturdy that would cause it to break whenever it is struck. The spell does not cause Sturdy to become fragile; it merely causes it to break in the same situations in which fragile things break. Although Sturdy is non-fragile, the counterfactual ‘If Sturdy were struck, it would break’ is still true. This goes against the sufficiency of the counterfactual.

3.4.1.3 Achilles Heels/Reverse-Heels. Not every counterexample involves interference from an outside source. Some involve “weird” objects – objects that behave as you would expect them to behave, except in one particular situation. Imagine, for example, that Weak has exactly one particularly strong spot on which it would *not* break upon being struck. Call this spot the “reverse-heel.”³³ Weak could still be fragile, provided that it would break on any other spot. If Weak were struck on its reverse heel, however, then it might falsify the conditional analysis: it would be fragile, but it would not break when struck.

Sturdy is subject to a similar problem. Although it is non-fragile, it might have one particular spot that is extremely delicate, an “Achilles heel.”³⁴ If it were struck on that spot, it would surely break; if it were struck on any other spot, it would not break. Suppose Sturdy just so happens to be struck on its Achilles heel. This might constitute a counterexample to the conditional analysis. Sturdy is non-fragile, and yet it is true that, if Sturdy were struck, it would break.

3.4.1.4 Responses. An immediate advantage of the alternative analysis is that it is not immediately subject to any of the above counterexamples. The reason is that my analysis does not imply that fragility is identical to any particular disposition ascription. Without this assumption, the counterexamples do not apply. They assume that fragility is analyzed with exactly one counterfactual. But I have already rejected this assumption. Therefore, finks, reverse-finks, maskers, mimickers, reverse-heels, and Achilles heels do not pose an immediate threat to the alternative analysis.

Even though the counterexamples do not pose an *immediate* threat, they may pose a threat, nonetheless. Perhaps they can be reformulated, so they more clearly threaten the analysis. Conceivably, the sorcerer’s powers could affect a number of dispositions at the same time. Couldn’t the sorcerer make *at least one* disposition ascription in *every* fragility-characteristic set

³³ (Manley and Wasserman, 2008)

³⁴ (Manley and Wasserman, 2008)

false? Suppose, for example, that the sorcerer acts as a fink to at least one disposition ascription in every fragility-characteristic set. On my analysis, this would entail that Weak is not fragile, which is clearly the wrong result. Similarly, the sorcerer might make *every* disposition ascription *in at least one* fragility-characteristic set true. In such a situation, although Study would be non-fragile, my analysis wrongly implies that it is. It is not obvious yet that these reformulated counterexamples are unsuccessful, so my analysis is still under threat.

A similar line of reasoning might apply to Achilles heels and reverse heels. Suppose, for example, that Sturdy has several different Achilles heels. Isn't it possible that, for some fragility-characteristic set, Sturdy satisfies every ascription in the set? If so, then my analysis would entail that Sturdy is fragile. Similarly, one could imagine that Weak has multiple reverse-heels – so many, in fact, that it *fails* to satisfy an ascription in every fragility-characteristic set. Once again, my analysis would get the wrong result.

I believe that the reformulated objections are unsuccessful. The key to answering the challenges brought on by these cases is the test of hypothetical scrutiny. In this section, I will first consider the objections aimed at Weak, and then I will consider those aimed at Sturdy. I argue that none of the objections are successful counterexamples to the alternative analysis.

The objections against Weak all aim to show one thing: although Weak is fragile, there is no fragility-characteristic set that “works” for it. In other words, one can always find at least one ascription in the set that is false of it. I believe that the objections are wrong because one *can* find a fragility-characteristic set that works. So, my analysis would agree with the objections that Weak is fragile, which means the alleged objections are no objections at all.

Regardless of whether Weak is guarded by a sorcerer, wrapped in protective packaging, or struck on its reverse heel, one can find a fragility-characteristic set that gives the correct verdict. There are two strategies. One is to find a set in which each member is precise enough to remain true even in the face of confounding factors. This strategy deals more effectively with finks and antidotes but less effectively with reverse heels. Another (perhaps more promising) strategy is to find a set in which each member is itself *multi-track*. This gives rise to a branching, tree-like kind of structure, as follows:

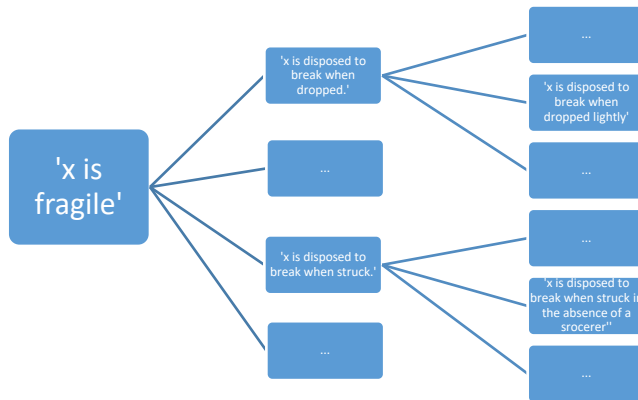


Figure 2: Multi-Track Structure

This tree represents just *one* fragility-characteristic set. Note that each member of the set is itself multi-track and therefore has its own D-characteristic set(s). We might further suppose that each of *these* is also multi-track, and so on down the line, until we get to some set of single-track ascriptions. With this in mind, imagine that Weak is guarded by a protective sorcerer. By hypothesis, the sorcerer makes false the single-track ascription ‘Weak is disposed to break when struck.’ It does not, however, make false the corresponding *multi-track* ascription. The latter ascription can still be true, provided one can find a striking-characteristic set that works for Weak. I submit that one *can* find a set that works, because there are sets in which the truth of its members is incompatible with the presence of the sorcerer. It is characteristic of things that are disposed to break when struck that they are struck in the absence of a sorcerer.

A similar line of reasoning applies to masking cases like the protective packaging, as well as those that involve a reverse-heel. It is characteristic of things that are disposed to break when dropped that they are dropped in the absence of protective packaging. So, even when Weak is dropped onto such packaging, it does not follow that the multi-track ascription ‘Weak is disposed to break when dropped’ is false. On the contrary, this multi-track ascription remains true of Weak, even while its single-track counterpart is false. And it also remains true if Weak were dropped onto its reverse-heel, for there are many dropping-characteristic sets in which Weak is not dropped onto its reverse-heel.

I have just argued that my analysis does not yield the unintuitive result that Weak is non-fragile. Now, I will argue that it also does not yield the unintuitive result that Sturdy *is* fragile. The objections considered above try to show that, although Sturdy is not fragile, one can find a

fragility-characteristic set that works for it. In this way, the objections claim that my analysis yields an unintuitive result.

Imagine that Sturdy is struck in the presence of a destructive sorcerer. Then, although Sturdy is not fragile, it would be rendered fragile so quickly that it would break upon being struck. This is a counterexample to my analysis if there is some fragility-characteristic set for which each member of the set is *true* of Sturdy. On the contrary, I maintain that no fragility-characteristic set works for Sturdy, and so this case is *not* a counterexample.

There are two reasons. First, so long as the sorcerer's powers are limited only to striking cases, there are plenty of other cases in which Sturdy fails to show its fragility. If at least *one* relevant ascription is false of Sturdy, my analysis still delivers the right result. Second, even if the sorcerer's powers are not limited in this way, there does not exist a fragility-characteristic set that works for Sturdy. That is to say, *every* fragility-characteristic set is incompatible with a sorcerer's interference.

Imagine (for the sake of *reductio*) that the opposite is true: there is some fragility-characteristic set ('F') that is compatible with the presence of a sorcerer. A contradiction ensues because F does not pass the test of hypothetical scrutiny. There is a physically possible case in which, although Sturdy is intuitively non-fragile, every ascription in F is true of it. (We might imagine, for instance, that Sturdy is being guarded by a destructive sorcerer.) If F does not pass the test of hypothetical scrutiny, it cannot act as a sufficiency test for fragility. And if it cannot act as a sufficiency test for fragility, it cannot be a fragility-characteristic set. Therefore, no fragility-characteristic set is compatible with a destructive sorcerer.

The argument given in the previous paragraph can be generalized to deal with cases of mimicking and Achilles' heels. Again, any set of ascriptions that is compatible with interference from a mimicker could not act as a sufficiency test. And even if Sturdy has one (or even more) Achilles' heels, this does not mean that *every* ascription in a fragility-characteristic set is true of Sturdy. As long as Sturdy is truly non-fragile, many ascriptions in the set will be false, even if one (or more) just happen to be true. So, I conclude that the alleged counterexamples do not show my analysis yields unintuitive results.

Let me summarize the arguments of this section. I argued that the counterexamples have no effect on my analysis, because in cases involving Weak, there is *some* fragility-characteristic set that works, and in cases involving Sturdy, there are *no* fragility-characteristic sets that work.

The sets that work for Weak involve “nested” multi-track ascriptions. If the members of a fragility-characteristic set are themselves multi-track, then the objections have no force. On the other hand, there is *no* set that works for Sturdy, in part because any set that is compatible with interfering factors does not pass the test of hypothetical scrutiny. In this way, my analysis delivers the correct result in response to both types of counterexamples.

3.4.2 Structural Problems

Philosophers have criticized the traditional approach by claiming that, irrespective of various counterexamples, it is fundamentally mistaken. Manley and Wasserman, for example, claim that the approach cannot account for the *comparative nature* of dispositions.³⁵ The approach offers no explanation as to what it means for one thing to be *more fragile* than another. Another potential problem is the role of *context*. In certain contexts, bricks are fragile; in other contexts, they are not. It seems that the traditional approach has nothing to say about how context contributes to the meaning of a disposition ascription. Finally, Barbara Vetter has argued that the traditional approach succumbs to what she calls the *problems of qualitative and quantitative diversity*.³⁶ What these problems apparently show is that even canonical ascriptions (with *ceteris paribus* clauses) cannot be linked to just a single counterfactual.

I believe that these structural problems can be reasons to prefer the alternative approach. I will argue that (1) the approach, in theory, can be extended to account for gradeability, (2) it can account for the contribution of context, and (3) it is not subject to problems of quantitative or qualitative diversity. But before I get into these responses, let us take a closer look at the structural problems themselves.

3.4.2.1 Gradeability. Dispositions often admit of degrees. Glass vases are more fragile than coffee cups, which are more fragile than bricks. Manley and Wasserman claim that it is a relative drawback of some traditional analyses that they do not account for the gradeability of disposition ascriptions. Such analyses offer no explanation of what it means for one object to be more fragile than another, or what it means for one person to be more irascible than another. This

³⁵ (Manley & Wasserman, 2008)

³⁶ (Vetter, 2013)

will seem like a problem as long as it is assumed that an analysis of disposition ascriptions *should* account for gradeability.

So far, I have not mentioned anything about the gradeability of dispositions. Manley and Wasserman, on the other hand, offer an analysis (PROP) that lends itself to an account of gradeability. Therefore, it might be thought that the alternative approach I have developed is inferior to Manley and Wasserman's approach because it does not account for gradeability. Perhaps this is not a decisive reason, but at the very least, it would be *one* reason to prefer Manley and Wasserman's approach to my own.

3.4.2.2 Context. Context contributes, somehow, to the meaning of disposition ascriptions. How? This question seems especially important because we are trying to give the general truth-conditions of disposition ascriptions. Since context is relevant to the truth-conditions, one must articulate how context makes its contribution. A natural suggestion, offered by some philosophers, is that context sets a *threshold*. The context of aerospace engineering sets a very high bar for what counts as a non-fragile object, whereas ordinary life does not. Thus, things that are not ordinarily considered to be fragile are fragile in an appropriate context like aerospace engineering.

I believe this is part of the story about the contribution of context. The bigger picture is that concepts are *adapted* to various human purposes. What starts out as a concept that applies mainly to things like champagne glasses and fine china can eventually apply to things like bricks and watches. As concepts like Fragility evolve, the number and variety of fragility-characteristic sets also evolves. Two fragility-characteristic sets might have *nothing* in common. This is why I say that gradeability is *part* of the story – context surely does contribute by setting thresholds, but it also contributes in other ways as well.

An important question is whether the alternative account has the resources to explain the ways in which context contributes to the truth of a disposition ascription. If it does not, then this would seem to be a drawback of the alternative approach. At best, it would suggest that the approach is incomplete; at worst, it would suggest that it is mistaken.

3.4.2.3 Diversity. In her paper “Multi-Track Dispositions,” Vetter claims that the problem with the traditional approach is the assumption that most disposition ascriptions can be

analyzed with exactly one counterfactual.³⁷ What's novel about her arguments is that they are targeted at *canonical ascriptions* as well as conventional ones. When it comes to conventional ascriptions, they are subject to the problem of *qualitative diversity*. Canonical ascriptions are subject to the problem of *quantitative diversity*.

Conventional dispositions like fragility can be realized in a variety of ways. Their stimulus conditions tend to be qualitatively diverse. Fragility, for example, is manifested in response to striking, dropping, tapping, heating, etc. Vetter argues that, if fragility is single-track, then its qualitative diversity cannot be accounted for. One would be forced to choose between an arbitrary stimulus condition or one that is too general. Since both options are bad, Vetter concludes that fragility cannot be adequately characterized in terms of a single counterfactual – i.e., it cannot be single-track.

Perhaps surprisingly, a similar problem awaits canonical dispositions. Stimulus conditions like *being struck* admit of different quantities: something can be struck with a certain degree of force, at a particular angle, with a particular speed, etc. Either we pick a particular quantity, or we generalize the stimulus by setting an appropriate range. Either way, Vetter argues that we run into problems. Her conclusion is that if the disposition to break when struck is single-track, then its quantitative diversity cannot be accounted for. Therefore, all but the most specific canonical ascriptions must be multi-track.

3.4.2.4 Responses. The first problem was to explain how the alternative analysis can account for gradable dispositions. First, I do not agree with Manley and Wasserman that an analysis of disposition ascriptions *should* account for gradeability. As I see things (and as many others see them as well), there are two distinct tasks. The first is to explain what is meant by disposition ascriptions; the second is to explain what is meant by *comparative* disposition ascriptions. (Comparative ascriptions include claims like 'X is more fragile than Y', 'X is more irascible than Y', and so on.) Although these tasks are importantly related, I can see no reason to expect that we must take them on all at once – i.e., that completion of the first task amounts to completion of the second. That being said, perhaps it is still an advantage of an approach if it can take on both tasks simultaneously. I believe that the alternative approach can do this. The more fragile something is, the more fragility-characteristic sets one would expect it to satisfy; the less

³⁷ (Vetter, 2013)

fragile something is, the fewer fragility-characteristic sets it satisfies. In other words, one might determine *how* fragile something is by paying closer attention to the *number* of fragility-characteristic sets it satisfies. Alternatively, one might loosen the requirement that a fragile object must satisfy *every* ascription in some fragility-characteristic set. Perhaps the object merely needs to satisfy *enough* ascriptions. If the requirement is loosened in this way, then the *number* of ascriptions that an object satisfies becomes relevant. Some objects will satisfy *more* ascriptions within a fragility-characteristic set than others, and those that satisfy more ascriptions can count as more fragile than those that do not.

I admit that these ideas need to be fleshed out, which goes far beyond the scope of this chapter. Nevertheless, gradeability is not necessarily a reason to prefer Manley and Wasserman's approach. The alternative approach has resources for understanding comparative disposition ascriptions, and it arguably does so in a way that is more straightforward.³⁸

The second problem was related to context: How does context contribute to the meaning of disposition ascriptions? One answer is that it sets a sort of threshold. If the context is aerospace engineering, then relatively few fragility-characteristic sets must be satisfied for something to count as fragile. This is one way in which my analysis could account for the contribution of context. Another way is to point out that context *privileges* or *makes salient* certain D-characteristic sets. In the context of watches, one group of fragility-characteristic sets is relevant; in the context of champagne glasses, another group is relevant. One could make this contribution explicit with a slight modification of the proposal:

(MT) Any multi-track ascription of the form 'x is D' is true just in case there exists a *contextually relevant* D-characteristic set for which *every* ascription in that set is true of x.

This formulation of MT makes it clear that context restricts which D-characteristic sets are relevant to the truth of 'x is D.' Whether or not champagne glasses break in circumstances characteristic of fragile watches is irrelevant to its fragility.

Finally, the last problem was based on the qualitative and quantitative diversity of the stimulus. Vetter argues that many conventional and canonical ascriptions are, in fact, multi-track,

³⁸ For one, my approach does not require one to make judgments about the relative sizes of different infinities.

meaning that they cannot be characterized in terms of a single counterfactual. It should be obvious now that I happily agree with this claim. We tend not to care much about single-track ascriptions in everyday life, as they lack the important properties of stability and plurality. What philosophers tend to overlook (and what Vetter helpfully points out) is that even canonical ascriptions tend to be multi-track. Realizing this important fact should only strengthen my proposal. It should help us to shake off the assumptions that underly the traditional approach and realize that what really matters is not the canonical/conventional distinction, but the single-track/multi-track distinction.

3.5 Conclusion

In this chapter, I presented an alternative to the traditional approach, which I called the *alternative approach*. The alternative approach differs from the traditional approach in that it rejects its basic starting point: the canonical/conventional distinction. Instead, I suggested that a more useful starting point is the single-track/multi-track distinction. Single-track ascriptions are counterparts of canonical ascriptions. Their truth may be located in a single counterfactual. Multi-track ascriptions are bundles of single-track or (other) multi-track ascriptions. Their truth conditions are given by MT. I argued that the alternative approach is at an advantage when it comes to various counterexamples and structural problems. This, I believe, is good reason to prefer the alternative approach over the traditional one.

CHAPTER 4

CAN DISPOSITION ASCRIPTIONS BE ANALYZED WITHOUT STIMULUS CONDITIONS?

4.1 Introduction

Many philosophers assume that there is a special connection between disposition ascriptions and counterfactual conditionals. It looks like conditionals might help us to understand disposition ascriptions. Under normal conditions, a vase is fragile if and only if it would break when struck. Plausibly, the reverse also holds true. Examples like this suggest that conditionals can be used to analyze disposition ascriptions. Any analysis that uses conditionals in this way is what philosophers call a *conditional analysis*. Even if they disagree with it, many philosophers at least recognize the conditional analysis as the default starting point for talking about dispositions.

Barbara Vetter (2014) challenges this starting point. She argues that the modality most closely associated with dispositions is not counterfactual modality but rather *possibility modality*. In addition, she argues that there are structural problems with the counterfactual account that should lead one to be skeptical of its prospects.³⁹ As an alternative approach, Vetter proposes the *possibility account*, according to which disposition ascriptions can be analyzed with possibility claims rather than counterfactuals.

In this chapter, I will examine Vetter's account and argue that it is not a superior starting point as compared to the standard conditional analysis. My conclusion is based on three claims: (1) The linguistic evidence offered by Vetter is insufficient; (2) Counterfactual modality is not different from possibility modality; and (3) Vetter's account cannot easily explain disposition ascriptions with explicit stimulus conditions.

This chapter is structured as follows. In section 4.2, I explain Vetter's view, the *possibility account*. Vetter provides reasons for thinking that this account has advantages relative to the *standard account*. In section 4.3, I evaluate these reasons and argue that they are ultimately unpersuasive. This is because (a) the linguistic evidence is insufficient; (b) possibility modality is not substantively different from counterfactual modality; and (c) the alternative conception has a hard time accounting for dispositions with explicit stimulus conditions. Due to

³⁹ (Vetter, 2014)

these reasons, I conclude that the alternative conception is not a superior starting point as compared to the standard conception.

4.2 Vetter's View: The Possibility Account

In “Dispositions Without Conditionals,” Barbara Vetter (2014) proposes an alternative to the standard conception of dispositions.⁴⁰ Whereas many philosophers apparently assume that the modality of dispositions is best captured by counterfactuals, Vetter argues that there are good reasons to question this assumption. She provides two reasons. The first reason is that certain pieces of linguistic evidence – namely, English Dictionaries – fail to mention stimulus conditions. The second reason is that, intuitively speaking, some dispositions seem to lack stimulus conditions – e.g., loquacity (otherwise understood as the disposition to talk frequently). Vetter takes both reasons to motivate an alternative conception, which she calls the *possibility conception*. On this view, dispositions are characterized by manifestation conditions alone; fragility, for example, most closely resembles the disposition to break *easily*. If dispositions are characterized only by their manifestations, then their modality is closest to *possibility*. But there are different kinds of possibility, ranging from logical and metaphysical to physical possibility. According to Vetter, dispositions are characterized by what she calls *easy possibility*.

In the first section (4.2.1), I examine the two sources of motivation for the possibility conception of dispositions. This involves explaining how Vetter thinks the two reasons given above motivate her account. In the next section (4.2.2), I reconstruct Vetter's account and explain how Vetter intends to interpret the notion of easy possibility. Both sections will set the stage for my evaluation of the view in section 4.3.

4.2.1 Motivation

It is not always easy to shake off one's preconceptions, especially when they go unnoticed or unchallenged. In the literature on dispositions, one widespread preconception is the idea that dispositions and conditionals share a very intimate connection. On David Lewis's view, for example, dispositions are individuated by both a stimulus and a manifestation, which

⁴⁰ (Vetter, 2014)

correspond to the antecedent and consequent (respectively) of a conditional.⁴¹ It's safe to say that other philosophers – even the ones that disagree with Lewis – have pretty much taken on board this way of conceiving dispositions. Vetter, however, is an important exemption. She argues that there are two good reasons to question the supposed relationship between dispositions and conditionals. (1) Linguistic evidence supports the idea that dispositions are individuated only by their manifestations. (2) Some dispositions seem to lack stimulus conditions altogether. Based on these reasons, Vetter concludes that one should be motivated to look for an alternative conception.

The linguistic evidence in support of claim (1) comes in the form of two studies, one by Goran Kjellmer (1986) and the other by Angelika Kratzer (1981).⁴² Kjellmer's study looked at a "complete typology of entries for terms in *-ble* in all standard English dictionaries" (Vetter, pg. 130, 2014). (This includes words like 'fragile' whose suffix ends in a variant of *-ble*.) So, for example, the study looked at terms like 'fragile,' 'soluble,' and 'transmissible.' The study found that the stimulus played no role whatsoever in the definition of any of these terms. In addition, the terms were defined by the disposition's manifestation. For instance, in the *Oxford English Dictionary*, 'fragile' was defined as 'liable to break or be broken,' 'soluble' was 'capable of being melted or dissolved,' and 'transmissible' was 'capable of being transmitted.'⁴³

One might worry that the findings of Kjellmer's study reflect linguistic conventions particular to the English language. Even if the English dictionaries tend to define dispositional terms a certain way, perhaps Chinese or Arabic dictionaries do not. If this is the case, then the "evidence" cited by Vetter is just a reflection of a particular linguistic convention; it would not, however, indicate a conceptual gap between dispositions and conditionals.

As a way of addressing this immediate worry, Vetter turns to Kratzer's study, which examines the use of suffixes in other languages – most notably, German. The notable finding, according to Vetter, is that "the suffixes *-lich* and *-bar* express possibility."⁴⁴ So, the practice of defining dispositional terms with possibility statements seems to have a certain "stability across languages."⁴⁵ It is not peculiar to the English language alone.

⁴¹ (Lewis, 1997)

⁴² (Kjellmer, 1986) and (Kratzer, 1981)

⁴³ (Vetter, 2014)

⁴⁴ (Vetter, 2014)

⁴⁵ (Vetter, 2014)

It is important to be clear about what Vetter concludes from these studies. Her conclusion is not that these studies provide conclusive evidence against the standard conception. The conclusion is rather weak: these studies *motivate* an alternative, possibility-based conception of dispositions. From both Kjellmer's and Kratzer's studies, we know that lexicographers in both English and German dictionaries are not in the habit of defining certain dispositional terms by identifying stimulus conditions. We should not conclude too much from this finding. Vetter does not suggest that we replace philosophy with lexicography. So, one should not think that the linguistic evidence is decisive.

Linguistic evidence aside, there may be another reason to look for an alternative: some dispositions seem to lack stimulus conditions. Following Fara (2005), Vetter notes that not every canonical ascription comes with a stimulus.⁴⁶ Radioactive isotopes, for example, are disposed to decay (spontaneously). In this case, it is not clear that there is any stimulus at all. Other, more mundane examples include loquacity and irascibility, understood as the disposition to talk and the disposition to get angry, respectively. Vetter believes that these examples (among other examples) should motivate one to question the assumption that dispositions are individuated by both stimulus and manifestation conditions.

Both the linguistic evidence and the problematic examples just mentioned are sources of motivation. Or so Vetter claims. On her view, after considering the evidence and the examples, one will probably be more skeptical of the standard conceptions and more open to her alternative. In section 4.3, I provide reasons why this reaction would not be justified in light of the reasons she provides. But before getting to my criticisms, let us consider the alternative conception itself.

4.2.2 The Alternative View

The alternative conception motivated by the previous considerations is the *possibility conception*. This consists of two claims:

Alternative View

- (1) A disposition is individuated by its manifestation to M. It is a disposition to M, full stop.

⁴⁶ (Fara, 2005)

- (2) Its modal nature is that of possibility, best characterized (to a first approximation) by ‘x can M.’⁴⁷

For example, on the alternative view, fragility is individuated by its manifestation alone – it is the disposition to break (easily), full stop. Its modal nature is that of possibility. The claim ‘This vase is fragile’ is to be evaluated by the possibility statement ‘This vase can break (easily).’

The alternative conception stands in contrast to the *standard conception*. The latter also consists of two claims:

Standard View

- (1) A disposition is individuated by the pair of its stimulus condition and its manifestation (or, if it is MT, by several such pairs): it is a disposition to M when subjected to the stimulus (S).⁴⁸
- (2) Its modal nature is best characterized (to a first approximation) by a counterfactual conditional ‘If x were S, x would M’ (or if it is a MT disposition, by several such conditionals).⁴⁹

On the standard view, fragility is not individuated by its manifestation alone. It is *also* individuated by its stimulus condition. If one assumes (for simplicity) that fragility is not multi-track, then it might be characterized as the disposition to break *when struck*. The claim ‘This vase is fragile’ could then be evaluated by a conditional – perhaps, for example, ‘If this vase were struck, it would break.’

A difficulty with the alternative account concerns the notion of *possibility*. There are different types of possibility. Just to name three: logical, metaphysical, and physical possibility. Logical possibility is the most permissive sense, metaphysical possibility is less permissive, and physical possibility is even less so. Importantly, many non-fragile things can break in all three senses. It is logically possible that a sturdy bridge breaks, and it is also metaphysically and physically possible, too. The difficulty, therefore, lies in giving an interpretation of possibility that adequately characterizes dispositions like fragility.

⁴⁷ (Vetter, 2014)

⁴⁸ ‘MT’ stands for “multi-track.” On Vetter’s view a multi-track disposition is one that cannot be adequately characterized by a single counterfactual.

⁴⁹ (Vetter, 2014)

Vetter claims that the relevant sense of possibility is *easy possibility*. Thus, to be fragile is to break *easily*, to be irascible is to get angry *easily*, to be flammable is to catch fire *easily*, to be soluble is to dissolve *easily*, and so on.⁵⁰ Of course, the notion of easy possibility itself needs explanation. (At the moment, it is not clear how it differs from other notions of possibility.) Vetter considers two possible interpretations: the *closeness conception* and *proportion conception*. For reasons I will not get into here, she ultimately rejects the former and instead adopts the latter.

The *proportion conception* interprets a possibility claim like ‘X can break’ as statement about the proportion of possible worlds in which X breaks relative to a total number. Here is a general statement of the view:

Proportion Conception: It is easily possible that p just in case there are a sufficiently large proportion of p -worlds (relative to the set of worlds W)⁵¹.

For example, the claim ‘This vase can break easily’ is true if and only if there are sufficiently many breaking-worlds (relative to W). It is obviously important how we understand “ W .” Roughly speaking, W consists only of *relevant* worlds. But which possible worlds are relevant? Vetter imposes four restrictions. (1) W consists only of *centered worlds*. These are triples of a world, object, and a time. (2) W is *finite* but sufficiently large. (3) W is *maximally diverse* (or at least sufficiently diverse). This means that the worlds should represent the object in a large array of different external situations. (4) W contains only worlds that have the same laws of nature as the actual world and in which an object has the same intrinsic properties as the actual object.

All in all, W is a *finite* set of centered worlds that is maximally diverse and subject to all the standard restrictions on possible worlds. We may now understand what it means, on Vetter’s view, for it to be true that this vase breaks easily. It means that the vase breaks in a sufficient number of relevant cases, where the “relevant” cases are standard (have all the same laws as the actual world and the vase has the same intrinsic properties) and represent a large enough array of

⁵⁰ Note that not all dispositions are given this treatment on Vetter’s view. Vetter distinguishes “easy” possibility from possibility “simpliciter,” which is more akin to physical possibility. An example is the disposition *breakable*, which may be analyzed with ‘X can break.’ This is possibility simpliciter. In this paper, I will focus on easy possibility claims only.

⁵¹ I understand p to be a proposition like *This vase breaks*. A p -world is a possible world in which proposition p is true.

diverse situations in which the vase might find itself. The thought is that if the vase is truly fragile, then it will break in some non-negligible proportion of those cases.⁵² Otherwise, the vase is not fragile.

Vetter anticipates two objections to the alternative view just explained. First, the view does not seem to account for dispositions with *overt* stimulus conditions. This includes, for example, the disposition to break when struck, the disposition to dissolve when placed in water, the disposition to sneeze when near flowers, and so on. How would Vetter's view account for canonical dispositions? The second objection is that Vetter's view seems subject to a particular type of counterexample. Consider, for instance, a case that I call "*Bob the Above-Average Sneezer*."

(Bob the Above-Average Sneezer) A newly discovered plant gives off a chemical that, to some people, causes sneezing when they are sufficiently nearby. A person who reacts in this way to the plant has a particular allergy to it. Suppose that Bob is not allergic to the plant; however, Bob has a special condition that causes him to sneeze in just about any situation he finds himself.

On Vetter's view, the allergen's disposition is individuated by its manifestation only. Thus, Bob has the allergy if and only if Bob is disposed to sneeze. According to Vetter, the ascription 'Bob is disposed to sneeze' expresses a possibility claim:

Bob is disposed to sneeze if and only if there is a sufficient proportion of relevant cases in which Bob sneezes.

Due to Bob's condition, the right-hand side of the bi-conditional is true – he sneezes in just about every case. Therefore, the left-hand side must also be true. However, it is evident that Bob does *not* have the relevant allergy, because Bob does not sneeze in *response* to the chemical. Therefore, the allergen's disposition cannot be individuated by its manifestation only; we need a stimulus (i.e., the flowers or the chemical) to distinguish the disposition to sneeze from other dispositions with the same manifestation.

⁵² The proportion might be very small, but it may be non-negligible, nonetheless.

Vetter's response to the first objection is that the intuition that some dispositions are characterized by both stimulus and manifestation conditions is the result of adopting the standard conception. In other words, the intuition conforms to the standard conception; the standard conception, however, does not conform to the intuition. If the intuition that some dispositions are individuated partly by a stimulus is the result of adopting the standard conception, then one cannot rely on those intuitions to justify that conception. To do so would confuse a causal connection for a justificatory one.

One might reply to Vetter by denying that our intuitions are biased by the standard conception in the way she imagines. Perhaps the conception conforms to the intuitions after all. In response, Vetter turns to linguistic evidence. She points out that the term '___ is disposed to ___ when ___' is an artefact of theoretical philosophy and does not commonly occur outside of it. The *Corpus of Contemporary American English* (COCA) seems to confirm this hypothesis.⁵³ Vetter reports:

“In the entire corpus, there is not a single example of ‘disposed to’ being used to ascribe to a concrete, inanimate subject a relatively permanent and intrinsic tendency to behave in certain ways – a disposition in the philosophers’ sense” (Vetter, 2014, pg. 147).

This finding seems to indicate that ‘disposed to’ is a technical term in philosophy. As such, intuitions about the nature of dispositions are already informed by the relevant theory – in this case, the standard conception. This makes it seem as though appealing to intuitions as a way of justifying the theory gets things backwards: the intuitions are already informed by theory; they do not inform it.

What about the second worry? The counterexample seemed to show that some dispositions (for example, the allergen's disposition to cause sneezing) cannot be understood merely in terms of its manifestation. Bob is surely disposed to sneeze; however, he is not disposed to sneeze in *response* to flowers. Doesn't that show that the allergen's disposition cannot be individuated merely by its manifestation?

In response to the second worry, Vetter claims that the allergen's disposition *can* be individuated by its manifestation, because the manifestation is a complex causal process. The

⁵³ (Vetter, 2014)

disposition to sneeze is distinct from the disposition to sneeze-in-response-to-flowers. The second disposition has a more complex manifestation that includes a particular causal process, while the first does not. Since the allergen's disposition is identical to the latter disposition (but not the former), Vetter can agree that Bob is not allergic to the flowers. A similar line of reasoning would apply to just about any other disposition that we think of as having a stimulus. For example, water-solubility is not simply being disposed to dissolve; it is being disposed to dissolve-when-placed-in-water. The difference is that the manifestation is a complex causal process and not simply a single event like dissolving. Since the causal process includes what we would ordinarily think of as the cause or "stimulus" of the disposition, it is different from an event like dissolving.

In the next section, I will evaluate Vetter's view, beginning with the motivation she provides for adopting the alternative conception. I will then argue that "possibility modality" is not distinct from "counterfactual modality." To support this claim, I show how Vetter's view can be recast within the standard conception. Finally, I will argue that Vetter's responses to both objections are unsatisfactory. I argue that the linguistic evidence in support of her first response is lacking and that the second objection cannot be avoided by trying to incorporate the stimulus into the manifestation.

4.3 Evaluation of Vetter's View

Perhaps the most important assumption underlying the alternative view is the claim that "possibility modality" is different from "counterfactual modality." If this were not the case, then Vetter's view might be viewed as a kind of counterfactual account. Indeed, as I will argue, one *can* recast the alternative conception as the standard conception. Possibility modality is not different from counterfactual modality.

My strategy for arguing for this claim will be to rely on the standard interpretation of modality in terms of possible worlds. The modality of necessity is truth in *all* possible worlds; the modality of possibility is truth in *some* (typically, at least one) possible world. Easy possibility – the modality of Vetter's view – is closer to possibility modality. Roughly, it is truth in a *non-negligible proportion* of centered worlds, where this is more than one world but much fewer than all worlds. I will argue that this particular modality can be modeled within the

standard (conditional) account. Thus, counterfactual modality is not at odds with possibility modality.

In section 4.3.3, I examine more closely the claim that possibility modality is distinct from conditional modality. But first, it is worth considering Vetter's motivation for the alternative approach, which includes linguistic evidence and dispositions without stimuli. I do not believe that either of these are sufficient motivators. In section 4.3.1, I argue that the linguistic evidence is lacking for several reasons. In section 4.3.2, I argue that the possibility of "stimulus-less" dispositions should fail to motivate us to give up the standard conception because the alternative conception faces an equal and opposite problem.

Finally, in the last two sections – section 4.3.4 and 4.3.5 – I return to the two primary challenges to Vetter's view. One challenge is supposed to be defeated by linguistic evidence concerning the usage of the term 'disposed to.' I explain (in the first of these two sections) why I do not think the linguistic evidence is enough to undermine the challenge. The other challenge is met by incorporating the stimulus into the manifestation. In the last section, I explain why I believe the two should be conceived of independently.

4.3.1 Linguistic Evidence? (Part 1)

Vetter's primary source of linguistic evidence is a study by Goran Kjellmer (1986). The study looks at terms in *-ible* in all standard English dictionaries; it reveals that the stimulus term does not appear in any entries. From this study, Vetter concludes that linguistic evidence motivates the alternative (non-conditional) conception of dispositions.

There are two reasons why the linguistic evidence fails to motivate the alternative conception. The first reason is that, even if the linguistic evidence favors the alternative conception, this fact does not necessarily have interesting philosophical consequences. The second reason is that the linguistic evidence *on balance* does not favor the alternative conception. In other words, even if Kjellmer's study in particular motivates the alternative conception, there may be other sources of motivation in favor of the standard conception. It's not clear that the evidence (overall) sufficiently motivates the alternative conception. One should consider sources of motivation *against* Vetter's view.

Let us return to the first reason. Even if the linguistic evidence favors the alternative conception, this might not *motivate* the alternative conception. Philosophical theory can be

motivated from a variety of sources. Perhaps studies examining patterns of dictionary entries could be one potential source, but this would depend on the theory. If the philosophical theory concerns the actual usage of a term, then linguistic evidence seems especially relevant. For example, if one held that the term ‘free will’ is applied in a compatibilist sense, then dictionary entries could be an illuminating source of evidence. However, other philosophical theories are not similarly motivated. The thesis that free will *should* be understood in a compatibilist sense is not typically motivated by appeal to dictionaries.

I am not claiming that there is no evidentiary relationship between philosophical theory and linguistic studies concerning philosophical terms. Rather, I am claiming that the existence of a pattern among dictionary definitions does not *necessarily* translate to *motivation* for a given theory. In other words: That entries of terms ending in *-ible* do not indicate a stimulus does not straightaway imply motivation for the alternative conception. Not all philosophical theories are motivated by data of this sort.

The second response to Vetter considers linguistic evidence *on balance* compared with Kjellmer’s study *in particular*. Even if we grant that Kjellmer’s study counts as motivation for the alternative conception, this is not enough to *motivate* (on balance) that conception because there are other relevant sources of motivation. Kjellmer’s study is just one consideration; there are many others. It might be the case that other sources of motivation work *against* the alternative conception. If this is the case, then even if Kjellmer’s study motivates that conception, it would not necessarily provide *sufficient* motivation.

Most notably, Kjellmer’s study only considers terms most closely related to the suffix *-ible* — e.g., ‘soluble,’ ‘irascible,’ ‘fragile,’ etc. While this accounts for a great deal of disposition terms, it does not account for all of them. Many disposition terms do *not* end with this suffix, which include: ‘charged,’ ‘fit,’ ‘virtuous,’ ‘slippery,’ ‘allergic,’ and ‘somniferous.’ The study also does not consider *canonical* expressions like ‘disposed to break when struck.’ It remains to be seen whether the full range of disposition terms follows the pattern picked out by Kjellmer’s study. In fact, a quick google search into the term ‘allergy’ suggests otherwise. The Merriam-Webster definition seems to mention a stimulus condition — “altered bodily reactivity (such as hypersensitivity) to an antigen in response to a first exposure” — which suggests the standard

conception rather than the alternative conception.⁵⁴ But even if this is just an anomaly (which is not obvious), there are other sources of linguistic evidence that must be considered.

Not all linguistic evidence comes in the form of the dictionary — verbal behavior, I take it, is also a form of linguistic evidence. A linguist could consider verbal behavior by conducting research into how people tend to talk about dispositions. When talking about dispositions, are people likely to mention a stimulus as well as a manifestation? How do people tend to respond to questions about dispositions? Considering other forms of linguistic evidence would lead to a better understanding of *all* available evidence. This might work in Vetter’s favor, or it might not. The point is that, without more research, it is uncertain whether the alternative conception is sufficiently motivated.

I have just argued that Vetter was too hasty to conclude that the linguistic evidence motivates the alternative conception. Another reason to think the inference was too hasty has to do with the nature of the evidence itself. Lexicographers might not be overly concerned to define things in a fully rigorous or completely accurate manner. Although they *do* strive for accuracy, lexicographers have other purposes, too. They must, for example, construct a dictionary that is *easily readable* and *succinct*. The function of a dictionary is not simply to inform but to do so in a particular way.

The practical aims of a dictionary make it unfit to motivate *any* conception of dispositions. For a moment, put yourself in the shoes of a lexicographer who is tasked with coming up with an entry for the term ‘fragility.’ You are now faced with two options:

- (1) “The quality of breaking easily”
- (2) “The quality of breaking in response to a wide variety of stimuli — e.g., striking, dropping, etc.”

To a lexicographer — who is not overly concerned with accuracy or rigor — both definitions may be adequately precise and may conform perfectly well to the usage of the term. However, definition (1) has the edge in that it is much more succinct. Thus, as a lexicographer, you would choose definition (1) as your preferred entry. Notice: your choice had *nothing* to do with the “intuitiveness” of the entry; it had to do with its brevity or succinctness. So, a dictionary sometimes sacrifices accuracy or rigor to fulfill one of its other aims. Because of this purpose,

⁵⁴ allergy. 2020. In Merriam-Webster.com. Retrieved January 1st, 2021. <https://www.merriam-webster.com/dictionary/allergy>

one cannot look to dictionaries as a reliable indicator that one philosophical conception is more intuitive than another. On the contrary, one would actually *expect* the alternative conception to conform better to dictionary definitions, precisely because it is simpler (i.e., more succinct) than the conditional approach.

4.3.2 Dispositions Without Stimuli?

As a second source of motivation for the alternative approach, Vetter appeals to dispositions that seem to lack stimulus conditions. This includes loquacity (the disposition to talk frequently), radioactivity (the disposition to emit certain particles), and transmissibility (the disposition of a disease to be transmitted).⁵⁵ On reflection, it seems that many dispositions lack stimulus conditions. This would appear to motivate the alternative conception since the standard conception assumes (or seems to assume) that dispositions must have stimulus conditions.

As a first reply, I would deny that the standard conception comes with the assumption that Vetter gives it. The standard conception, as I see it, is an attempt to provide an analysis of disposition *ascriptions*. It does not, however, attempt to say anything about the nature of dispositions *themselves*.⁵⁶ So, let us distinguish between two different questions:

- (1) Does every disposition have both a stimulus and manifestation?
- (2) Can every disposition ascription be analyzed with a stimulus and manifestation term?

Even if the answer to the first question is “no,” the answer to the second may be “yes.” Stimulus and manifestation *conditions* are different from stimulus and manifestation *terms*. The former are events, while the latter are linguistic devices. In the philosophical literature, talk of dispositions and talk of disposition *ascriptions* tend to blur together, which can lead to confusion. Vetter, for example, claims that the modality of dispositions is possibility, and it is clear that she intends to depart from the standard conception. However, the standard conception should be about disposition *ascriptions* – not dispositions themselves. Although there is modality involved, it is the modality of *claims* (or propositions) not properties. One should be able to accept the standard

⁵⁵ (Vetter, 2014)

⁵⁶ In fact, the authors whose views are supposed to fall under the standard conception all attempt to give analyses of disposition *ascriptions*. This includes David Lewis, Sungho Choi, and Manley and Wasserman.

conception while remaining neutral on the nature of dispositions themselves.⁵⁷ This isn't to say that there is *no* connection between dispositions and disposition ascriptions. It is rather to deny that the connection is *evidentiary*: the existence of a stimulus term is not evidence for the existence of a stimulus. In the same way, the existence of a predicate like 'unicorn' is not evidence for the existence of a real property.

I have just suggested that one could remain neutral about the first question even while answering "yes" to the second. One question that arises naturally is how to interpret disposition ascriptions lacking a stimulus term on the standard conception. Manley and Wasserman propose one answer.⁵⁸ They suggest that a disposition like loquacity is multi-track and should be analyzed using infinitely many, highly specific counterfactuals. Although I will not go into detail about their view here, I take it that Manley and Wasserman's proposal shows one way of answering question two. It shows how disposition ascriptions like 'Bob is loquacious' may be analyzed using counterfactuals, and it does not require one to take a stance with respect to question one.

Let us assume for a moment that the answer to question two is "no." This does not mean that there is more motivation for the alternative approach. In fact, the alternative conception faces an apparently equal and opposite problem as the standard conception. This is the problem of dispositions with *explicit* stimulus conditions. While the standard conception has a hard time explaining dispositions that seem to *lack* stimulus conditions, the alternative conception has an equally hard time explaining dispositions that seem to *have* them. (Such dispositions include canonical dispositions corresponding to 'X is disposed to M when S.')

Since the alternative conception faces an equally serious problem as the standard conception, it is not the case that there is more motivation for the alternative conception. Although Vetter develops a response to this problem, I argue in section 4.3.5 that her response is ultimately unsuccessful. Therefore, this remains a serious problem for the alternative conception — at least as serious, I think, as the problem of dispositions *without* stimulus conditions. So, the alternative conception does not garner support from an ability to account for dispositions with explicit stimulus conditions.

⁵⁷ This is my own position. Although I accept the standard conception, I do not take a stance on the nature of dispositions *themselves*. Thus, I answer "yes" to the second question, and I decline to answer the first question.

⁵⁸ (Manley & Wasserman, 2008)

4.3.3 Different Modal Natures?

Perhaps the most important assumption underlying Vetter's argument is the claim that "possibility modality" is different from "counterfactual modality." She argues that the former type of modality characterizes dispositions better than the latter type. If she is wrong about this, then the alternative conception is only superficially different from the standard conception. In this section, I will argue that Vetter is, in fact, wrong about this assumption because the alternative conception may be recast as a conditional account.

I should first emphasize something that was said before: I do *not* believe that the standard conception is about the nature of dispositions themselves. Most of the authors to whom Vetter attributes this view actually endorse a view about disposition *ascriptions* (not dispositions). Sungho Choi, for example, defends a particular analysis of disposition *ascriptions*.⁵⁹ The unfortunate blending in the literature between talk of dispositions and talk of disposition ascriptions leads to confusion. It leads to the thought that the modality of dispositions *themselves* is somehow "captured" by conditionals. But it is unclear how dispositions can have a modal nature at all. Modality, it is usually assumed, is a feature of statements or propositions — it is a way in which those statements or propositions are true.

Let us put aside the issue just mentioned. Perhaps properties can have modal natures after all. The question that I want to explore now is whether "possibility modality" is distinct from "counterfactual modality," as Vetter's argument assumes. I will argue that they are not distinct. My argument will be based on the *Possible Worlds* interpretation of modality, which is perhaps the most popular and widely accepted interpretation of modality currently.

On the possible worlds interpretation, modal claims like 'It is possible that it will rain today' are analyzed in terms of possible worlds. *Possibility claims* express that a proposition is true in *at least one* possible world. Therefore, 'It is possible it will rain today' expresses that there is at least one possible world in which it will rain today. On the other end of the spectrum, *necessity claims* express that a proposition is true in *every* possible world. For example, 'It *must* rain today' expresses that, in every possible world, it will rain today.

Different types of necessity and possibility are obtained by varying the range of possible worlds that count towards the truth of a modal claim. *Metaphysical* necessity is truth in every

⁵⁹ (Choi, 2008)

possible world, whereas *physical* necessity (for example) is truth in every possible world having the same laws of nature as the actual world. In natural language, it can often be ambiguous what kind of necessity or possibility is expressed. The sentence ‘When I drop the ball, it *must* fall to the ground’ is not typically taken to express metaphysical necessity. Rather, it expresses a fact about all worlds having the same laws as the actual world (physical necessity). Similarly, on Vetter’s view, the claim ‘This vase can break’ is not taken to express metaphysical possibility — it does not usually mean ‘There is a possible world in which this vase breaks.’ Rather, the claim expresses what Vetter calls *easy possibility*.

In section 4.2.2, I explained how Vetter understands the modality of “easy” possibility. Easy possibility is (roughly) truth in a non-negligible proportion of centered worlds. More specifically, it is interpreted according to the *proportion conception*:

Proportion Conception: It is easily possible that p just in case there are a sufficiently large proportion of p -worlds (relative to the set of worlds W).

We saw before that there are several restrictions on W . It is a finite, maximally diverse subset of centered worlds, where each world is “normal” or “standard,” meaning that they all have the same laws as the actual world and the object has the same intrinsic properties in each world as its actual counterpart.

The possible worlds interpretation is also used to understand the truth-conditions of counterfactuals. This approach was developed by Lewis and Stalnaker.⁶⁰ On their interpretation, a counterfactual of the form ‘If X were the case, then Y would be the case’ is true (in the actual world) just in case all the closest X -worlds are also Y -worlds.⁶¹ Closeness between worlds is understood as *resemblance* between them. The more closely a world resembles the actual world, the *closer* it is to the actual world. (Every world perfectly resembles itself and so is closest to itself.) Certain questions arise about this view — e.g., “How does one determine which possible worlds most closely resemble the actual world?” — but it is not necessary to answer those

⁶⁰ Cite the Lewis and Stalnaker.

⁶¹ This is an oversimplification of the view, but it suffices for my purposes. If there are no X -worlds, then the counterfactual is trivially true. We may assume, for simplicity, that there is always a “closest” world (or set of worlds) although Lewis himself thought that the worlds could always get closer by being more similar to the actual world.

questions here.⁶² I only require a rough presentation of the Lewis/Stalnaker view for the purposes of my argument.

Let us return to the main question: Is easy possibility modality distinct from counterfactual modality? The answer, we can now say, depends on whether claims expressing easy possibility can be interpreted in terms of counterfactuals. In other words, there may be two (equally good) ways of understanding the proportion conception: *truth in* a non-negligible proportion of possible worlds and *truth of* a non-negligible proportion of counterfactuals. Therefore, I will argue, the alternative conception represents only a different way of *talking* about dispositions; it does not, however, offer a different account of their *modality*.

My argument for the above claim will use the example ‘This glass is fragile.’ On the alternative conception, ‘This glass is fragile’ is to be analyzed as a possibility claim — i.e., ‘This glass breaks easily.’ The latter claim, in turn, is to be understood according to the proportion conception:

(Proportion) ‘This glass breaks easily’ just in case there are a sufficiently large proportion of *breaking*-worlds relative to W.

Now, I will argue that the proportion conception itself can be understood in terms of counterfactuals. I will argue for the following equivalency:

(Equivalency) There are a sufficiently large proportion of *breaking*-worlds relative to W just in case a sufficiently large proportion of counterfactuals are true relative to C.

If the equivalency holds, then the possibility claim can be interpreted directly in terms of counterfactuals, as follows:

‘This glass breaks easily’ just in case a sufficiently large proportion of counterfactuals are true relative to C.

The implication of this argument would be that there are two ways of talking about the truth-conditions of possibility claims: one as Vetter would have it and the other according to the standard conception. If possibility claims can be understood in terms of counterfactuals, possibility modality would not be distinct from counterfactual modality. A major assumption in Vetter’s argument would prove to be false.

Before I can argue that Equivalency holds true, I need to explain some core notions that will be essential to my argument. The most familiar notion is the set W, which I said before

⁶² For additional details on this interpretation of counterfactuals, see Lewis, 1997.

contains a finite number (n) of possible worlds. W is subject to the restrictions mentioned – i.e., it is a maximally diverse subset of centered worlds, where each world is “normal” or “standard.” Each world in W is assigned a name from ‘ W_0 ’ to ‘ W_n .’ For any world W_n , there is a set of conditions (S_n) that describe *exactly* the glass’s situation. It is important that S_n is specific enough that it applies only to W_n . For example, if the glass is dropped onto a concrete floor in W_n , then S_n contains a description of the event *being dropped onto concrete*.

The final notion is a set of counterfactuals (C), each of the form ‘If the glass were in S_n , it would break.’ Each counterfactual in C is assigned a name from ‘ C_0 ’ to ‘ C_n .’ Just as W has certain restrictions, C also has certain restrictions. (1) C contains a finite number of counterfactuals. (2) Each counterfactual in C is *restricted*: their antecedents specify an object in a situation (S_n) at a particular time. (3) C is maximally (or sufficiently) diverse: the antecedents of all the counterfactuals represent a large and diverse array of situations. (4) C is normal: for any counterfactual in C , its antecedent is restricted to situations involving the same laws as the actual world in which the glass has the same intrinsic properties as the actual glass.

The claim that I now wish to defend is Equivalency, which is a bi-conditional statement connecting the possibility account to the standard conception:

(Equivalency) There are a sufficiently large proportion of *breaking*-worlds relative to W just in case a sufficiently large proportion of counterfactuals are true relative to C .

I will argue that this claim is true following the standard way of establishing biconditionals — what is sometimes called *biconditional introduction*. First, I will assume the left-hand side and show how the right-hand side follows. Then, I will assume the right-hand side and show how the left-hand side follows.

Consider now the entailment from left to right. This entailment is represented by the following conditional:

(Equivalency-L) If there are a sufficiently large proportion of *breaking*-worlds relative to W , then a sufficiently large proportion of counterfactuals are true relative to C .

Suppose the antecedent is true — i.e., there are a sufficiently large proportion of *breaking*-worlds relative to W . On Vetter’s view, if this is true, then the glass is fragile. Recall that C is a set of counterfactuals (C_0 to C_n) of the form ‘If the glass were in S_n , it would break.’ And recall that S_n is the situation in which the glass finds itself in W_n . The sentence ‘There are a sufficiently large proportion of *breaking*-worlds’ means ‘In enough situations in which the glass finds itself, it

breaks’ — which is just to say that enough conditionals of the form ‘If the glass were in S_n , it would break’ are true.

Consider now the entailment from right to left. This entailment is represented by the following conditional:

(Equivalency-R) If a sufficiently large proportion of counterfactuals are true relative to C , then there are a sufficiently large proportion of *breaking*-worlds relative to W .

Suppose again that the antecedent is true — i.e., a sufficiently large proportion of counterfactuals are true relative to C . This means that enough counterfactuals of the form ‘If the glass were in S_n , it would break’ are true. Once again, S_n is the situation in which the glass finds itself in W_n .

Suppose, for instance, that S_1 is a perfectly normal situation in which the glass is dropped onto a concrete floor from high off the ground. If the sentence ‘If the glass were in S_1 , it would break’ is true, the glass breaks in all the closest S_1 worlds. Since W_1 is among the closest S_1 worlds, this entails that W_1 is a *breaking*-world. The same conclusion follows, *mutatis mutandis*, for each other true counterfactual in C . Since the proportion of true counterfactuals in C is the same as the proportion of *breaking*-worlds in W , there must be a sufficiently large proportion of *breaking*-worlds relative to W .

I conclude that Equivalency holds true. What are the general implications? First, there are two, equally good ways of developing a semantics for easy possibility claims. The first way (alternative conception) is in terms of centered worlds; the second way (standard conception) is in terms of counterfactuals. Second, and relatedly, the alternative conception is not substantially different from the standard conception — it is not as if there are two different “modalities” represented by each view. We should think of these different conceptions rather as different *linguistic frameworks*. The standard framework draws on an existing framework of counterfactuals while the other tries to make do without it.

Finally, one can see how the alternative conception silently incorporates stimulus conditions into the picture. *Why is it the case*, we need to ask, that there is a sufficiently large proportion of *breaking*-worlds relative to W ? It is not simply because fragile things break easily. There is a hopeless infinity of hopelessly diverse possible worlds. There is *no such thing* as a “maximally diverse” and finite subset of this infinite structure. And even if we limit ourselves to “sufficiently diverse” subsets, what guarantee is there that all of *these* contain the right proportion of *breaking*-worlds? The only guarantee is to rig the game (so to speak). One must

deliberately choose to include enough worlds in which the glass undergoes the right stimulus. Only by rigging the game in this way can we guarantee that W is both diverse *and* contains the correct proportion of *breaking*-worlds. I conclude that Vetter’s view only appears to ignore the stimulus, when in fact the stimulus plays an integral role in deciding what subset of worlds counts as “sufficiently diverse.”

4.3.4 Linguistic Evidence? (Part 2)

Let us turn now to the two objections raised to Vetter’s view before. The first objection was that the alternative conception cannot account for dispositions with *explicit* stimulus conditions. These include canonical dispositions such as the disposition to break when struck, the disposition to dissolve when placed in water, and so on. The second objection had to do with a particular type of counterexample — Bob the Above-Average Sneezer. In this section, I will argue that Vetter’s response to the first objection is not satisfactory. In the next section, I will argue that the same holds for her response to the second objection.

Vetter’s response to the first objection was to deny that there is adequate support for canonical dispositions.⁶³ Linguistic evidence, she claims, suggests that the canonical formulation ‘X is disposed to M when S’ is an artifact of theoretical philosophy. As such, it cannot be used as evidence for canonical dispositions. In other words, canonical dispositions do not motivate the standard conception; it is the other way around — the intuition that there are canonical dispositions is actually the *result* of adopting the standard conception.

Vetter’s response would not be successful if she ended up being wrong about the order of explanation. In her view, the standard conception explains the intuition. But perhaps it is actually the other way around, or perhaps a bit of both. In support, Vetter cites the *Corpus of Contemporary American English* (COCA), which is the largest corpus for the English language (Vetter, 2014). The corpus reveals that the term ‘disposed to’ is not commonly used in connection with counterfactuals or dispositional properties.⁶⁴

Once again, I believe that Vetter’s conclusion is too hasty. The linguistic evidence does *not* show that the belief in stimulus conditions is the result of adopting the standard conception. First of all, that a term has a distinct ordinary usage does *not* imply that its theoretical usage is

⁶³ A canonical disposition is one that is characterized by both stimulus and manifestation.

⁶⁴ It is more often used in connection with agents – as in, ‘N is willing to A.’

unintuitive. One actually would expect the theoretical usage of a term to differ from its ordinary usage. Most theoretical terms are like this. For example, ‘mass’ and ‘weight’ tend to be used interchangeably in ordinary conversation. (When asked, “Why can’t you push that car?” one is likely to respond, “Because it weighs too much.” Strictly speaking, the car’s *mass* explains why it is hard to push, not its weight. Its weight would explain why it is hard to lift.) I take it that the terms ‘mass’ and ‘weight’ as they are used in physics are not therefore “unintuitive.” By the same token, the fact that the theoretical usage of ‘disposed to’ differs from its ordinary usage does not imply that the theoretical usage is unintuitive.

Once this point is made clear, it is difficult to feel the pull of Vetter’s argument. We can readily agree with her point that ‘disposed to’ is not ordinarily used in the philosophical sense. (This much should have been obvious!) Given the point, what comes of it? It does not follow that the philosophical sense is unintuitive, for the same reason that the theoretical sense of ‘mass’ and ‘weight’ are not necessarily unintuitive. So, it would seem that the original objection remains – dispositions with stimulus conditions seem to threaten the alternative conception.

It may be worthwhile to point out what it would take to flesh out Vetter’s argument. Vetter would have to show (1) that adopting the standard conception causes the belief in stimulus conditions and (2) that the belief is not commonly held independently of it. Even though both (1) and (2) currently lack support, experimental philosophy might help Vetter’s case. Participants who are not familiar with the standard conception can be asked (directly or indirectly) whether they believe that some dispositions have stimulus conditions. If they initially think ‘no’ but subsequently gain the belief *after* adopting the standard conception, this will count as evidence for Vetter’s view. Otherwise, if they initially think ‘yes,’ this will motivate the objection *against* Vetter’s view.

The type of study mentioned above would not establish whether dispositions have stimulus conditions. It would only help to establish whether the general population finds the idea intuitive. But even if the general population is on Vetter’s side, we must keep in mind that the standard conception ought to be about disposition *ascriptions* — not disposition themselves. So, even if dispositions are individuated only by manifestation conditions, it might still be the case that canonical *ascriptions* cannot be analyzed without a stimulus term. In the next section, I will examine Vetter’s attempt to account for the role of the stimulus term in disposition ascriptions and argue that it is not satisfactory.

4.3.5 Complex Manifestations?

The case of Bob the Above-Average Sneezer spells trouble for the alternative conception. Although Bob is disposed to sneeze, he is not disposed to sneeze in response to flowers. Given the proportion conception, it seems that Vetter's view wrongly entails that Bob is allergic to the flowers. Bob sneezes in a non-negligible proportion of possible worlds, but Bob does not have the allergy.

Vetter's response to this case is to *complexify* the manifestation. Bob is not simply disposed to sneeze; he is disposed to sneeze-when-near-flowers. *Sneezing-when-near-flowers* is a complex causal process that differs from *sneezing*. Thus, the alternative conception recognizes two different dispositions: the disposition to *sneeze* and the disposition to *sneeze-when-near-flowers*. Since Bob's disposition is only the former (not the latter), Vetter's view correctly entails that Bob is not allergic to the flowers.

Or does it? Suppose Bob is in a field of flowers when he sneezes. Did he undergo the manifestation *sneezing* or *sneezing-when-near-flowers*? Although he is near flowers when he sneezes, he does not undergo *sneezing-when-near-flowers* because the flowers did not *cause* his sneezing. So, the disposition to sneeze-when-near-flowers is partly individuated by the cause of the sneezing. On the alternative view, if the cause partly individuates the disposition, then the cause is *part* of the manifestation, because dispositions are individuated only by their manifestations. But the cause cannot be part of the manifestation.

Suppose, for reductio, that the cause of fragility (striking) is part of the manifestation (breaking-after-being-struck). This glass is fragile. It is struck, and sure enough, it breaks. Clearly, the glass has undergone the manifestation for fragility, which is typically explained by two facts. (1) The glass is fragile, and (2) it was struck. In other words, the glass's being struck (combined with its fragility) *caused* the glass to undergo the manifestation. But if the striking is part of the manifestation, then the glass's being struck caused it to be struck, which is absurd. Nothing causes itself – not even partly.

In short, if the cause of the breaking is part of the manifestation, then absurdity ensues. To avoid such absurdity, Vetter must deny (2). She must deny that the manifestation of fragility is caused by striking. But this also seems an absurd result. What else caused the manifestation of

fragility if not the striking? If it was some event *outside* of the manifestation, then one should want to know why that event is not the disposition's stimulus.

The difficulty is related to the notion of a *manifestation*. Unlike the standard conception, the alternative conception cannot say that a manifestation differs from other events by standing in a causal relationship to the stimulus. Normally, we understand a manifestation to be an event caused by the stimulus. But the alternative conception incorporates the stimulus *into* the manifestation, so that the manifestation needs to be understood some other way. Vetter's view gives rise to a question: What other way should that be?

Even if Vetter can answer this question, there is a separate issue. One reason to prefer the alternative conception is due to its apparent simplicity. Whereas the standard conception requires both stimulus and manifestation, the alternative conception requires only manifestation. But Vetter's response threatens this simplicity. Whatever simplicity was gained by taking the stimulus out of the picture is immediately lost by adding it to the manifestation. And to make matters worse, some of the old problems are also transferred in the process — e.g., “Just how specific does the manifestation have to be?” and “Does the manifestation need to include a saving clause?” If simplicity no longer favors the alternative conception, it is not clear why one should prefer it to the standard conception.

4.4 Conclusion

I have argued against the alternative conception in three ways. (1) The alternative conception is not sufficiently motivated, especially by the linguistic evidence offered by Vetter. (2) Possibility modality is not distinct from counterfactual modality. (3) The two major objections to the alternative conception still pose significant threats to it, even in light of Vetter's responses. The linguistic evidence is not sufficient, because it does not actually suggest that the standard conception is any less intuitive. Possibility modality is not distinct from counterfactual modality, because the alternative conception can be modeled within the standard conception. Finally, the objections against the alternative conception stand, because (a) the linguistic evidence does not show that belief in stimulus conditions is the result of adopting the standard conception and (b) there are significant problems raised by incorporating the stimulus into the manifestation. I believe that these are good enough reasons *not* to prefer the alternative conception to the standard one.

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BIOGRAPHICAL SKETCH

My name is Francis Caruso. I started the process of obtaining a doctorate degree in philosophy from Florida State University about seven years ago in August 2014. Since that time, I have completed a master's degree in philosophy as well as significant progress on this project. Before Florida State, I was a student at University of North Carolina at Charlotte, where I earned my Bachelor of Science in psychology. My favorite subject was logic, which is what led me to philosophy, since the two are very much connected. I have since moved on to study topics in Analytics, where my focus currently lies.