

## On dispositional masks

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### 1. Introduction

Glasses remain fragile even if they do not break on any given drop. I remain disposed to make coffee upon waking in the morning even on days when I sleep past noon. Ordinary dispositions fail to manifest with astounding frequency and for a number of reasons. Some do so because they are *masked*: they are placed in a position such that the causal chain which would normally cause them to manifest is interrupted. A number of accounts of masks have been advanced, but I will argue in this paper that none have yet succeeded.<sup>1</sup> I will propose an analysis of masks that accounts for, among other things, dispositional masks which *reduce the probability* that a disposition will manifest.

I will begin (§2) with some methodological preliminaries. The problems facing any analysis of dispositions are far too complex to adjudicate in a single paper; addressing any one problem requires making commitments to certain controversial theses about dispositions. I will then (§3) highlight six key problems that any analysis of masks must be able to address. Then, I will (§4) argue that a number of influential attempts to solve masks fail to address each problem. Finally (§5), I will offer a new analysis of dispositional masks which I argue is able to address all six problems better than other influential accounts of masks can.

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<sup>1</sup> See Lewis (1997), Fara (2008), Manley and Wasserman (2008), Contessa (2013), and Gebharder and Fischer (2019) for some attempts to solve the problem of masks. I will discuss each of these accounts in detail in §4 of this paper.

My aim is to offer the necessary and sufficient conditions for the most useful way of thinking about dispositional masks. Masks are an interesting phenomenon in their own right, but they are also highly relevant to a host of other metaphysical issues. The analysis that I will offer, if correct, can be used to address a number of problems both in the metaphysics of dispositions and in its applications. An analysis of masks is necessary for the *ceteris paribus* or ideal conditions clause used in subjunctive analyses of dispositions.<sup>2</sup> In applications of dispositional analyses, masks are an important issue as well; an analysis of masks is necessary for analyzing concepts such as free will (Vihvelin 2004, 2013) and skill (Stanley and Williamson 2017).

## 2. Preliminaries

Discussions of dispositions require commitments to controversial claims. I will aim to keep my commitments as explicit as possible and as few as possible: I aim for the account of dispositions which I develop here to be compatible with any view of dispositions. I will thus stay neutral on, among other things, the questions of whether dispositions themselves are intrinsic or extrinsic, as well as the question of whether finks and masks can be intrinsic.<sup>3</sup> Though I assume that a conditional analysis of dispositions is correct—I take it that for any disposition, there exists some counterfactual conditional expressing the relationship between its stimulus and manifestation—I will stay neutral on whether dispositions can be *reduced* to conditionals or merely *correspond* to conditionals. Further, I will aim for the account of masks that I develop to

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<sup>2</sup> See Mumford (1998), Steinberg (2010), and Fischer (2013) for some examples of conditional analyses of dispositions that incorporate *ceteris paribus* or ideal conditions clauses.

<sup>3</sup> Lewis (1997), for instance, assumes the intrinsicness of dispositions; McKittrick (2003) argues for the possibility of extrinsic dispositions. Clarke (2008, 2010) and Kittle (2015b) argue that intrinsic interferers (a blanket term for masks, finks, and antidotes) are possible, while Choi (2005, 2011a, 2017a, 2017b) argues that they are not. Choi distinguishes between dispositional and categorical properties by arguing that categorical properties such as triangularity can be intrinsically finked, while dispositional properties such as fragility cannot.

be consistent with an approach to dispositions that differs in structure from the conditional analysis.

I will assume that dispositional ascriptions need not be fully specific; though I argue for this point in §4, I assume it throughout this paper. Attributing the disposition to break when dropped to a commonplace glass need not involve specifications of the particular circumstances that surround the attribution. I take it, then, that the disposition to break-when-dropped-while-wrapped-in-bubble-wrap is distinct from the disposition to break-when-dropped *simpliciter*, and that further variants on these dispositions can be distinguished.<sup>4</sup>

The view that I will assume here requires something similar to Fisher's (2013) notion of 'auspicious circumstances.' Fisher argues that in delineating dispositions, we should distinguish between three component parts: the stimulus, the manifestation, and the auspicious circumstances. The disposition to break (manifestation) when dropped (stimulus) in ordinary household circumstances (auspicious circumstances) differs from the disposition to break (manifestation) when dropped (stimulus) on a construction site (auspicious circumstances); thus, an interior designer and a construction worker are both correct when they say, respectively, that a television set is and is not disposed to break when it is dropped.<sup>5</sup>

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<sup>4</sup> I draw the use of hyphenated specifications from Bird (2000). The information contained within the hyphens should be understood as a component part of the circumstances in which the entity is disposed to display its characteristic manifestation.

<sup>5</sup> Fisher is hardly the only philosopher to raise this point. Such distinctions can be traced back at least to Mumford (1998). Malzkorn (2000), and Choi (2008) make similar suggestions; Lewis (1997), arguably, does so as well. Though they vary on whether they take such conditions to be distinct from the stimulus conditions for a disposition, Fisher argues that proposals according to which such conditions must be conjoined with a stimulus are alike in spirit to his own.

### 3. Desiderata for an account of masks

#### 3.1. Six problems

First among the problems plaguing analyses of masks is what I will call the *actuality problem*. Dispositions can be masked even if they are never stimulated. A glass might be wrapped in bubble wrap and yet never dropped; even if it is never dropped, the presence of the bubble wrap still masks the glass' fragility. Relying solely on the actual sequence of events cannot, in itself, tell us whether any particular disposition is masked.

Here, it is useful to distinguish between two ways in which dispositional ascriptions might be used: as explanatory tools and as predictive tools. We can explain why a certain event happened by positing the presence of a disposition—'the glass broke when it was struck because it was fragile'—and we can predict what events will happen by positing the presence of a disposition—'the glass would break if it were struck because it is fragile.' If we are concerned with the former, the actual sequence of events can (usually) tell us whether a particular disposition is masked.<sup>6</sup> However, if we are concerned with the predictive sense in which a dispositional ascription might be used, we must examine certain counterfactuals.

Analyses of masks, like ordinary dispositional ascriptions, must account for both the explanatory and predictive powers of dispositional ascriptions. Masks can be used to explain why certain events happened (or did not happen)—'the glass did not break when it was dropped because it was wrapped in bubble wrap'—and masks can be used to predict what events will happen—'the glass would not break if it were dropped because it is wrapped in bubble wrap.' An account of masks cannot rely solely on the actual sequence of events in order to distinguish

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<sup>6</sup> I will argue below that a disposition might manifest even if it is masked. As such, examining the actual sequence of events to determine whether a disposition is masked or not might sometimes lead us astray. I will return to this issue in §3.2 of this paper below.

masking cases from non-masking cases. If, for instance, our analysis required that a disposition be stimulated in the actual sequence of events, a glass wrapped in bubble wrap that is not dropped would not count as having a masked disposition.

Second among the problems I will highlight is the *probability problem*. Some dispositions are inherently probabilistic. Prior, Pargetter, and Jackson (1982) define probabilistic dispositions as those whose stimuli and causal bases are jointly sufficient for the relevant probability of their manifestation. Choi (2017a) correctly notes that such dispositions must be distinguished from cases of masks, offering the example of a tossed coin: a fair coin has a probabilistic disposition to land on heads in 50% of cases; the stimulus (being tossed) and the causal basis (the intrinsic structure of the coin) are jointly sufficient for a 50% chance of the coin's landing on heads.

An analysis of dispositional masks must be able to distinguish between a case of masking and a case of a probabilistic disposition which fails to manifest solely because the chance of manifestation is less than 100%. Without such a distinction, any time that a coin lands on heads, for instance, we would be forced to wrongly conclude that its disposition to land on tails was masked by its happening to land on heads.<sup>7</sup>

Closely related to the probability problem is the *degree problem*. Putting a lid on my cup of tea prevents most of the heat from escaping, but not all. Wrapping a glass in bubble wrap

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<sup>7</sup> Choi (2017a) argues against the possibility of intrinsic interferers by means of this distinction. He argues that for some case in which an entity's disposition fails to manifest in the presence of its stimulus, we would do better to categorize its failure as the result of its disposition being probabilistic. When Randy drops his football en route to the endzone, we should not say that he failed to score because his ability to score was subject to intrinsic interference; instead, we should say that Randy has a probabilistic disposition to score a touchdown. While I agree that this is the best explanation for this particular case, there are other cases for which the best explanation would seem to be an intrinsic interferer: alcohol intoxication, for instance, is an intrinsic state which interferes with certain capacities of its bearer.

might prevent the glass from shattering while still allowing it to break slightly. To say that masks *must* prevent (or reduce the probability of) a disposition *manifesting at all* overlooks this nuance. An analysis of masks must account for cases in which a mask causes a disposition to manifest to *less of a degree* than it would have if the mask were not present.

Fourth is the *possession problem*. Some entity might fail to display the characteristic manifestation of fragility when it is dropped because it is not fragile. Though this point is obvious, an analysis of masks must distinguish between cases in which an entity has a disposition but fails to display the manifestation because its disposition is masked and cases in which an entity lacks a disposition altogether. This distinction requires some work towards an account of entities—the entity composed of the union of the glass and the bubble wrap surrounding it, for instance, must be distinguished from the glass itself, as the latter's disposition to break when dropped is masked by the presence of the bubble wrap, whereas the former is simply not disposed to break when dropped.

Fifth is the *finkish problem*. In certain cases, an entity's intrinsic properties (or surrounding environment in the case of extrinsic dispositions) might change when the stimulus for its disposition obtains. The standard example of a fink is Lewis's (1997) sorcerer who is fond of a particular glass; every time that the glass is exposed to the stimulus for its disposition to break when dropped, the sorcerer casts a spell that alters the chemical structure of the glass such that it ceases to be fragile. To capture all and only cases of masks, our analysis must exclude cases of finks.

There is some disagreement as to whether any distinction between masks and finks needs to be drawn as such.<sup>8</sup> Beyond theoretical interest in what, if anything, distinguishes the two, giving good explanations of why dispositions failed to manifest and making accurate predictions about whether dispositions will manifest in the future, however, requires that such a distinction be drawn. The best explanation for why a finkish disposition failed to manifest when its stimulus conditions came about is that it lost its disposition; the best explanation for why a masked disposition failed to manifest when its stimulus conditions came about is that something interrupted the causal chain that otherwise would have caused it to manifest. This is a significant difference, and one for which an analysis of masks must account.

Sixth and finally is the *simultaneous interference problem*. Masks can, in principle, accompany other forms of interference. Consider, for instance, a novice sorcerer who does not yet trust his ability to alter a glass' chemical structure when it is dropped. To preclude embarrassment, he wraps the glass in bubble wrap, masking its disposition. Upon dropping the glass, however, he successfully casts a spell that changes its intrinsic structure. A successful analysis of masks must account for the fact that the glass' fragility was masked prior to being finked.

### 3.2. Are masks probabilistic?

Before I consider whether any existing account of masks is able to address each of these problems, I will address a potential objection. Examining the actuality and probability problems jointly yields the conclusion that a disposition might sometimes be exposed to its stimulus conditions while in the presence of a mask and, in the actual sequence of events, still manifest.

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<sup>8</sup> Contessa (2013) uses the blanket term 'interferer' to refer to both, and Gebharter and Fischer (2019) hold that finks are just one kind of mask. I will discuss both of these proposals in §4 below.

Intuitively, one might think that if the disposition manifests despite the presence of a mask, we should say that the disposition was not masked at all. Suppose that a glass is dropped while wrapped in bubble wrap but happens to break anyway (perhaps because the bubble wrap only decreases the probability that the glass will break when dropped by a small percentage). Would it be reasonable, in such a case, to say that the glass' disposition to break when dropped was not masked?<sup>9</sup>

In the explanatory sense discussed above, such a conclusion might be reasonable. If we are merely focused on the actual sequence of events and attempting to explain why a glass broke when it was dropped, it might be useful to say that the glass' disposition to do so was not masked insofar as the bubble wrap did not actually prevent the glass from breaking when it was dropped. But while there are some *prima facie* reasons to take this stance, this position leads to counterintuitive results. Consider a glass wrapped in bubble wrap in a world ( $W_1$ ) with indeterministic laws of nature, and consider its counterpart in another world ( $W_2$ ). Suppose that the laws of nature are such that the glass would break as the result of being dropped while wrapped in bubble wrap in exactly 50% of cases across these two worlds, and that the glass is dropped and breaks in  $W_1$  and that the glass is dropped and remains unbroken in  $W_2$ . Assuming that the conditions in which the glass is dropped are identical across the two worlds, we would be forced to say that the glass is masked in  $W_1$  and not masked in  $W_2$  despite there being no difference between these two circumstances.

One might object that in the explanatory sense, holding that the same sheet of bubble wrap both is and is not a mask is not absurd. But regardless of whether such a conclusion is

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<sup>9</sup> Thanks to an anonymous referee for pressing me on this point.



reasonable when we are concerned with the explanatory sense, it is clearly unreasonable when we are concerned with the predictive sense. If whether an entity masks a disposition depends on whether the disposition manifests, then for any probabilistic mask, we cannot know whether it *actually masks* the disposition in question until after the disposition is stimulated. If the presence of a sheet of bubble wrap decreases the probability that a glass will break from 100% to 10%, for instance, then we cannot know before the glass is dropped whether the glass' disposition is actually masked, as we will not know whether the glass will break when dropped. If we cannot know whether an entity is a mask until the disposition that it masks is stimulated, then we run full force into the actuality problem once again: we can only appeal to the actual sequence of events in determining whether some disposition is masked.<sup>10</sup>

#### 4. Accounts of masks

With these problems in mind, we can turn to some attempts to address masks. I will examine in detail Fara's (2008), Manley and Wasserman's (2007, 2008, 2011), Contessa's (2013), and Gebharder and Fischer's (2019) attempts to address masks and argue that all of them fail to account for at least one of the problems above; each offers a suggestion distinct enough to warrant independent consideration.<sup>11</sup> First, though, I will argue against an approach which many have taken: getting specific.

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<sup>10</sup> My contention is not that in such cases, the glass' disposition is masked in the explanatory sense and not masked in the predictive sense. I am arguing that in both senses, the glass' disposition is masked, but that even if one wants to hold that, in the explanatory sense, it is better to say that the disposition is not masked, we still must say that it is masked in the predictive sense.

<sup>11</sup> The accounts that I discuss here are, of course, far from the only approaches discussed in the literature on dispositions and masks. See, for instance, Handfield (2008), Vetter (2015), and Steinberg and Steinberg (2017).

#### 4.1. Getting specific

A common approach to dispositional masks can be found in what Manley and Wasserman (2008) call ‘the strategy of getting specific.’ This strategy, first suggested by Lewis (1997: 153) and later advanced in different forms by, among others, Gunderson (2002) and Choi (2006, 2008), effectively denies the existence of masks altogether. Rather than say that some disposition failed to manifest because it was masked, this strategy tells us to instead say that a disposition failed to manifest because its manifestation conditions were not satisfied. In Johnston’s case of a glass protected by an inserted piece of styrofoam, for instance, we should rather say that the glass is disposed to break when dropped *while not supported by a piece of styrofoam*.<sup>12</sup>

Despite the intuitive pull to this approach, it suffers a number of problems. As Mumford (1998) notes, infinitely many phenomena can mask a disposition. As a project towards getting clear on what properties ordinary dispositional ascriptions entail, then, the strategy of getting specific does not take us very far. If we hope to attach the stimulus conditions to a counterfactual conditional, we will have to specify infinitely many seeming masks that do not obtain.

Mumford suggests that we should instead rule out possible masks by means of an ‘ideal conditions’ clause. But as Manley and Wasserman (2008) argue, such a clause also moves away from ordinary language dispositional ascriptions; appealing to ideal conditions means that everything is disposed to do everything that it could possibly do. If a piece of paper were

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<sup>12</sup> This strategy must be distinguished from a similar strategy: the move from ‘conventional’ dispositional predicates (e.g. fragility) to ‘canonical’ dispositional predicates (e.g. the disposition to break when dropped). Lewis advocates this move as well, but it is not, in itself, his approach to the problem of masks: he argues that a proper analysis of a disposition can avoid masks by means of a specified antecedent. With respect to poison, for instance, Lewis offers the following: “We might offhand define a poison as a substance that is disposed to cause death if ingested. But that is rough: the specifications both of the response and of the stimulus stand in need of various corrections. To take just one of the latter corrections: we should really say ‘if ingested without its antidote’” (1997: 153).

dropped under the ideal conditions for its breaking when dropped, it would break when dropped, yet it seems obviously wrong to say that a piece of paper is fragile.

Regardless of the success of Manley and Wasserman's objection, there is a more fundamental flaw in the strategy of getting specific. On this strategy, every dispositional ascription must be perfectly specific, fixing every particular fact that might bring about some change in the degree or probability of the manifestation. Yet in ordinary conversation and in scientific practice, every surrounding feature is not (and likely cannot be) fixed in a dispositional attribution.

If dispositional attributions can be anything less than perfectly specific, then the strategy of getting specific fails. Consider, for instance, the following dispositions:

- (a) The disposition to break when dropped in ordinary kitchen conditions
- (b) The disposition to break when dropped in ordinary kitchen conditions while wrapped in bubble wrap
- (c) The disposition to break when dropped in ordinary kitchen conditions while *not* wrapped in bubble wrap

An advocate of the strategy of getting specific might argue that we should distinguish between these three dispositions, holding that some entities have (b) or (c) and that (a) must be further specified as one of (b) or (c). Ordinary kitchen glasses have (c), one might hold, while they do not have (b).

Because this strategy seems to deny the intuitive claim that some objects have the disposition expressed in (a), we should only adopt the strategy of getting specific if it is fully able to solve the problem of masks; without such a capacity, the strategy would seem to raise more problems than it would solve.

Is adopting the strategy worth the cost? Even if we should do so, the probability and degree problems pose a threat. Suppose that we were to hold that an ordinary glass has disposition (c) and does not have disposition (b). How can we account for a case in which it is dropped while not wrapped in bubble wrap and fails to break? Or for a case in which a glass is dropped while wrapped in bubble wrap and yet happens to break regardless?

Specifiers might hold that (b) and (c) do not yet express perfectly specific dispositions; we must further specify every other fact about the hardness of the floor, the height from which the glass is dropped, and so on. Once we get to some perfectly specific disposition, they might hold, there will be no cases of masking. Any such assumption, however, relies on the impossibility of indeterministic laws of nature. As long as the laws of nature might be indeterministic (i.e. such that for precisely the same background conditions, there is a sub-1 chance of an outcome), the strategy of getting specific cannot succeed.

That the strategy of getting specific fails at the very edges of the debate does not, in itself, mean that the strategy cannot be applied to dispositions such as (a). Yet the strategy is strongly counterintuitive insofar as it does not match up with our ordinary language dispositional ascriptions, and the motivation for the strategy seems to be that this counterintuitiveness is outweighed by the fact that the strategy is able to overcome problem cases. If, as seems apparent, the strategy cannot overcome such problem cases, our motivation for adopting it should wane: we should instead accept that dispositional ascriptions need not be fully specific. Doing so requires that we look elsewhere for a solution to the problem of masks.

## 4.2. Fara's account

In his defense of the principle of alternative possibilities from Harry Frankfurt's (1969) famous attack, Michael Fara (2008) offers the following account of masked agential abilities:

An agent's ability to *A* in circumstances *C* is masked iff:

- (1) The agent tries to *A*;
- (2) circumstances *C* obtain;
- (3) the agent retains the ability to *A* while trying to *A*; yet
- (4) the agent does not succeed in *A*ing (Fara 2008: 848).

We can apply this analysis to simple dispositions as well:

An object's disposition to *A* in circumstances *C* is masked iff:

- (1) the object is exposed to its stimulus;
- (2) circumstances *C* obtain;
- (3) the object retains the disposition to *A* while exposed to its stimulus; yet
- (4) the object does not *A*.

Fara's analysis captures many commonplace instances of masking. Consider the following case, adapted from Whittle (2010):

(BOUND BEN): Ben, an excellent swimmer, has been forcibly bound to a chair. He watches helplessly as a child drowns in a lake (Whittle 2010: 10).

Ben is not a quitter, so he struggles against his ropes for the entire time that he is bound. He thus satisfies (1), as he tries to exercise his ability to save the drowning child. The circumstances for his ability to save the drowning child obtain, satisfying (2), because he is in the presence of a drowning child while awake.<sup>13</sup> No fink is present, and Ben retains his intrinsic properties while trying to save the child, satisfying (3). And sadly, Ben fails to save the child, satisfying (4).

Similarly, a glass wrapped in bubble wrap that is dropped and does not break satisfies each condition. It is exposed to its stimulus, satisfying (1); the circumstances in which it is

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<sup>13</sup> It might be objected that the circumstances do not obtain, as he is bound. One might hold that we should attribute to him the more specific dispositional ability to save-drowning-children-while-not-bound. Yet this approach runs into the problem discussed above with the strategy of getting specific.

disposed to break when dropped obtain, satisfying (2); the glass' intrinsic properties remain the same, satisfying (3); the glass does not break, satisfying (4).

Yet Fara's analysis is overinclusive with respect to certain cases and underinclusive with respect to others. Consider first the actuality problem: a glass that is wrapped in bubble wrap but not dropped fails to satisfy (1), rendering the conclusion that the glass' disposition is not masked. Similarly, if Ben, recognizing the futility of his circumstances, chose not to attempt to struggle against the ropes, he would not try to save the child, failing to satisfy (1) and again yielding the conclusion that his ability is not masked.

Next, consider the probability problem: suppose that a glass is disposed to break when dropped in 90% of cases. If a series of nomic duplicates of the glass were dropped in identical circumstances, 10% would satisfy each condition. The glasses would be exposed to their stimulus in the proper circumstances for their breaking, they would retain their dispositions, and would not break. This would render the absurd conclusion that precisely the same conditions can mask and fail to mask a disposition at the same time.<sup>14</sup>

Similarly, it is possible for the presence of a mask to reduce the probability that a disposition manifests without rendering it impossible. If the bubble wrap protecting a glass, for instance, lowered the probability that the glass would break from 10% to 1%, we should consider the bubble wrap a mask. But for those cases in which a glass breaks when dropped despite being wrapped in bubble wrap, Fara's analysis would yield the conclusion that the glass' disposition to break when dropped is not masked.

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<sup>14</sup> I take it that this position is absurd because, as noted above, attributions of masks must serve a predictive capacity to be at all philosophically or scientifically useful.

Next, consider the degree problem: a glass wrapped in bubble wrap chips slightly upon being dropped but would have shattered if it were dropped while not wrapped in bubble wrap. In both cases, (4) is rendered false because the manifestation is displayed, yet there is a difference in degree of manifestation between the two cases which Fara's analysis overlooks.

Fara's analysis fares well on both the possession and finkish problems: because he specifies that the entity in question must be disposed to break when dropped, and because he specifies that it cannot lose its disposition throughout the process, his analysis correctly categorizes such cases. But on the simultaneous interference problem, he again faces trouble. Consider again the Hater of Styrofoam who breaks the glass despite its being protected in styrofoam. Despite the fact that the glass' disposition to break when dropped is masked, Fara's analysis yields the conclusion that it is not, as (4) goes unsatisfied.

#### 4.3. Manley and Wasserman's account

In a series of papers presenting what they take to be a structural flaw in the conditional analysis of dispositions, David Manley and Ryan Wasserman (2007, 2008, 2011) present a view of masked dispositions. They begin with a characterization as follows:

A disposition is masked [...] when it would not disappear in the presence of the relevant stimulus, but where the characteristic manifestation would still be absent (2007: 68).

In light of the problems with the strategy of getting specific, the failure of which (in conjunction with a further series of problems) they take to undermine conditional analysis of dispositions, they propose the following analysis of dispositional ascriptions:

(PROP) *N* is disposed to *M* when *C* if and only if *N* would *M* in some suitable proportion of *C*-cases (2008: 76).

*C*-cases, or stimulus condition cases, are precise combinations of values relevant to a disposition's manifesting. In the case of a glass, for instance, any particular *C*-case will involve

specifications of, among other things, the laws of nature, the height at which the glass is dropped, the hardness of the surface onto which it is dropped, and the density of the material through which the glass is dropped. If, among the set of all possible *C*-cases, the glass breaks in a suitable proportion, the glass is disposed to break when dropped in *C*. What counts as a suitable proportion of cases depends on the context and nature of the dispositional attribution; some dispositions require higher thresholds of successful *C*-cases than others. Manley and Wasserman argue that (PROP) is able to address finks and masks:

It is easy to see that this proposal avoids the two traditional problems for conditional analyses. For the right-hand side of our bi-conditional holds even if an object happens to be in ‘bad’ case where its disposition is finked or masked. All that is required is that the object would break in a suitable proportion of stimulus cases, where these will include any finkish or masking cases; and it makes no difference whether these are actual (2008: 76-77).

While their proposal might succeed as an account of dispositions generally, this approach does not take any step towards delineating *which* cases are finks and masks and which cases are probabilistic failures. So while their approach is able to address the actuality, possession, and degree problems, the probability, finkish, and simultaneous interference problems go unsolved. This is, to be clear, merely a difference between the aims of their project and mine here—they aim to give an account of dispositions, whereas my aim is to give an account of masks.

#### 4.4. Contessa’s account

Gabriele Contessa (2013) ties an account of interferers directly into his conditional analysis of dispositions. According to Contessa, the main problem facing the simple conditional analysis of dispositions is the challenge of finding a non-circular means of excluding cases of finks and masks from the antecedent of the counterfactual conditional. Contessa proposes an ‘Interference-Free Counterfactual Analysis’ and offers the following analysis of *destructive*



interferers (masks and finks), which can be contrasted with *constructive* interferers (mimics and reverse-cycle finks<sup>15</sup>):

- (DI):  $x$  (destructively) interferes with  $o$ 's being intrinsically disposed to  $M$  when  $S$  iff:
- (1)  $I_1$  and . . . and  $I_k(x)$  and . . . and  $I_n$  (where 'x' occurs free at least once in ' $I_1$  and . . . and  $I_k(x)$  and . . . and  $I_n$ '),
  - (2) it is nomically possible that not- $(I_1$  and . . . and  $I_k(x)$  and . . . and  $I_n)$ ,
  - (3) it is not the case that, if it were the case that  $S$ , then  $o$  would  $M$ ,
  - (4) for each  $I_j$  ( $1 \leq j \leq n$ ), even if it were the case that not- $(I_1$  and . . . and  $I_{(j-1)}$  and  $I_{(j+1)}$  and . . . and  $I_n)$ , it would still not be the case that, if it were the case that  $S$ , then  $o$  would  $M$ ,
  - (5) if it were the case that not- $(I_1$  and . . . and  $I_k(x)$  and . . . and  $I_n)$ , then:
    - (5.1) it would be the case that, if it were the case that  $S$ , then  $o$  would  $M$ , and
    - (5.2) it would not be the case that, if it were the case that not- $S$ , then  $o$  would  $M$ ,
  - (6) it is not the case that, if it were the case that not- $(I_1$  and . . . and  $I_k(x)$  and . . . and  $I_n)$ , then some (proper or improper) part of  $o$ ,  $o^*$ , would acquire some (sparse, natural) intrinsic property (2013: 407).<sup>16</sup>

Condition (1) specifies that at least one interfering state of affairs obtains, while simultaneously allowing for multiple interferers to be present. (2) requires that the interferer is some nomically contingent state of affairs; it must be possible that the interferer does not obtain. (3) requires that if the stimulus were to obtain, the object would not display its characteristic manifestation. (4) specifies that any given interfering state of affairs is sufficient for the counterfactual associated with the disposition being false. (5) requires that if the interferer were not present, then if the stimulus obtained, the entity would display the manifestation characteristic of that disposition and that if the stimulus did not obtain, then the entity would not display the manifestation. Finally, (6) screens off cases in which the entity gains some other disposition.

Contessa specifies that his account is intended to address only surefire dispositions, thus temporarily putting off the probability problem. We can thus begin by examining a very fragile

<sup>15</sup> Martin (1994) uses the term 'reverse-cycle finks' for finks which would imbue an entity with a disposition if the stimulus conditions for that disposition were to obtain. A dead wire is not disposed to conduct electricity, but if it were attached to a reverse-cycle fink, it would turn on whenever touched.

<sup>16</sup> Contessa offers a similar analysis, *mutatis mutandis*, for constructive interferers: mimics and reverse-cycle finks. I will not discuss that analysis in detail here, but I hold that the same objections I level against DI apply.

glass with a surefire disposition to break when dropped that is wrapped so strongly in bubble wrap that it will not break if it is dropped. Such a glass has its disposition to break when dropped masked because (1) an interfering state of affairs actually obtains (the glass is actually wrapped in bubble wrap); (2) it is nomically possible that the state of affairs does not obtain; (3) if the glass were dropped, it would not break; (4) the bubble wrap is such that even if there were no other interferers present, the glass would still not break if it were dropped; (5) if the glass were not wrapped in bubble wrap, then if the glass were dropped, it would break, and if it were not dropped, it would not break; (6) it is not the case that if the glass were not wrapped in bubble wrap, then it would acquire some intrinsic property.

How does Contessa's analysis fare on our tests? The actuality problem does not pose a threat; Contessa specifies that a state of affairs can be something as broad as a person's disposition to, for instance, protect some object, allowing for the would-be mask to appear when the stimulus obtains (2013: 412). The possession problem is clearly solved; condition (5) ensures that the entity must have the disposition in question.

Contessa is also able to address the simultaneous interference problem, though in such a way that cannot solve the finkish problem. Contessa's account tells us that bubble wrap counts as a mask even in the presence of a guardian sorcerer, because if the sorcerer were not present, the bubble wrap would still interfere. Yet there are no means provided for distinguishing between a case of a mask and a case of a fink (though, of course, this is by design; Contessa is concerned with an analysis of interferers, not of masks).

The main challenges for Contessa's analysis are the probability and degree problems. As noted, Contessa argues that his analysis is intended only to address surefire dispositions. We can,

as such, merely push off the probability problem until some later time but doing so will not overcome the degree problem. Consider again the glass with a surefire disposition to break when dropped, but suppose that it will shatter when dropped while not wrapped in bubble wrap and merely chip when dropped while wrapped in bubble wrap. Contessa's analysis would yield the conclusion that the bubble wrap does not mask the glass' disposition to break when dropped, as the manifestation would appear regardless of whether the glass is wrapped in bubble wrap.

#### 4.5. Gebharter and Fischer's account

In a recent paper, Alexander Gebharter and Florian Fischer (2019) have offered a sophisticated analysis of dispositions which they argue can account for masks. Drawing on Spirtes et al.'s (2000) and Pearl's (2000) work on causal models, Gebharter and Fischer analyze dispositions in terms of *causal Bayes nets*: triples  $\langle \mathbf{V}, \mathbf{E}, P \rangle$  where  $\mathbf{V}$  is a set of random variables,  $\mathbf{E}$  is a binary relation on those random variables, and  $P$  is a probability distribution. In its broadest strokes, Gebharter and Fischer's view is that some object has a disposition just in case the probability of the manifestation is higher given the stimulus (or stimuli) for that disposition than the probability of the manifestation *not* given the stimulus (or stimuli). The probability that a glass breaks given that the glass is struck or dropped is higher than the probability that the glass breaks *not* given either of those events, so glasses are fragile. More specifically, Gebharter and Fischer offer the following definition:

*(Disposition)* Objects  $u$  of type  $U$  have the disposition  $[Y = y \text{ if } X_1 = x_1, \dots, X_n = x_n]$  if and only if there is a model  $\langle \mathbf{V}, \mathbf{E}, P \rangle$  (with  $X_1, \dots, X_n, Y \in \mathbf{V}$ ) satisfying the causal Markov condition and a context  $\mathbf{C} = \mathbf{c}$  (with  $\mathbf{C} \subseteq \mathbf{V} \setminus \{X_1, \dots, X_n, Y\}$ ) such that

1.  $X_1, \dots, X_n, Y$  describe possible events involving objects  $u$  of type  $U$ , and
2.  $\langle \mathbf{V}, \mathbf{E}, P \rangle$  correctly represents a part of the true causal structure of and the true regularities to be found in the world, and
3.  $P(y|do(x_1, \dots, x_n, \mathbf{c})) > P(y|do(\mathbf{c}))$ , and
4.  $P(y|do(x_1, \dots, x_n, \mathbf{c})) > P(y|do(x, \mathbf{c}))$  holds for every subsequence  $x$  of  $x_1, \dots, x_n$

(2019: 8).<sup>17</sup>

Here, dispositions are represented by the expression  $[Y = y \text{ if } X_1 = x_1, \dots, X_n = x_n]$ , where the variables  $X_1 \dots X_n$  represent the various stimulus conditions for the disposition and  $Y$  represents the manifestation.

Suppose, for simplicity's sake, that the only stimulus conditions for fragility are being dropped and being struck with a hammer. For the type 'glass,' some object of the type is fragile if and only if there is a causal Bayes net  $\langle \mathbf{V}, \mathbf{E}, P \rangle$  such that the set of variables  $\mathbf{V}$  contains the stimuli (being dropped, being struck with a hammer) and the manifestation (breaking), where the stimuli are possible events involving the type 'glass,' the causal Bayes net  $\langle \mathbf{V}, \mathbf{E}, P \rangle$  correctly represents the causal structure and regularities of the world, and for each of the stimulus conditions, the probability of breaking is higher given that stimulus condition obtains than is the probability of breaking in a context  $c$ . The definition of any given disposition can be further complicated by introducing each additional stimulus condition into the set  $\mathbf{V}$ : for fragility, we can further add being struck with a baseball bat, being thrown at a wall, and so on.

Though this definition is highly technical, it captures the probabilistic nature of dispositions: the stimulus must make it more likely that the manifestation would appear, but need not guarantee that it would appear. Further, Gebharter and Fischer argue that their account is able to solve the problem of masks. For Gebharter and Fischer, masks are phenomena that would cancel out the causal impact of the presence of the stimulus.

Suppose that  $D$  is a binary variable standing for whether some glass is dropped ( $D = 1$  means that the glass is dropped and  $D = 0$  means that the glass is not dropped) and  $B$  is a binary

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<sup>17</sup> Satisfaction of the causal Markov condition requires that all  $X \in \mathbf{V}$  are probabilistically dependent of their non-effects given their causes. The *do*-operator is Pearl's (2000):  $do(x_i)$  indicates that  $x_i$ 's value is set to  $x_i$  by an intervention.

variable standing for whether the glass breaks ( $B = 1$  means that the glass breaks and  $B = 0$  means that the glass does not break). Further, suppose that  $S$  is a binary variable standing for whether the glass is supported by an internal structure that would prevent it from breaking if dropped ( $S = 1$  means that the glass is supported by such a structure and  $S = 0$  means that the glass is not supported by such a structure). Here, intervening on the value of  $S$  would change the context from  $C = c$  to a new context,  $C = c'$ , in which the glass' disposition would be masked. Summing up their view, Gebharter and Fischer write that “we can identify masks as causal factors that cancel the causal influence of the stimulus conditions on the disposition's manifestation in some causal contexts” (2019: 16). Because the presence of the internal structure would cancel out the causal influence of the stimulus on the manifestation, it masks the glass' disposition.

As presented, this analysis cannot account for three of the problems discussed above: the probability, degree, and finkish problems. Despite the sophisticated treatment of probabilistic dispositions that Gebharter and Fischer offer, their account requires that masks *entirely* cancel the causal influence of the stimulus conditions. Yet this does not account for the probabilistic nature of masks: a mask, as I have argued, decreases the probability of the manifestation but does not eliminate it entirely.<sup>18</sup>

Similarly, as presented, Gebharter and Fischer's view cannot overcome the degree problem. By treating the manifestation of a disposition as a binary variable—either the

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<sup>18</sup> It should be noted that changing Gebharter and Fischer's account slightly would address this problem: instead of holding that a mask must cancel the causal influence of the manifestation, they could hold that the mask must *reduce* the causal influence of the manifestation. The analysis of masks that I will offer in §5 below can be wedded to Gebharter and Fischer's account—as it can be wedded to any account of dispositions—and can allow their view to overcome this problem.

manifestation appears or it does not—their view cannot account for cases in which a mask decreases the proportion to which a disposition manifests.

Finally, this account of masks cannot distinguish between masks and finks, as both finks and masks cancel out the causal influence of the stimulus on the manifestation. Gebharter and Fischer argue that this is not a problem for their account: in their view, finks are just one kind of mask (2019: 19). While denying a distinction between masks and finks does offer a degree of simplicity, it comes at the cost of both explanatory and predictive power. With respect to the explanatory power of masks, an account that does not differentiate between masks and finks overlooks the key difference between the two: the best explanation for why a finkish disposition does not manifest is because the disposition changed when the stimulus appeared, while the best explanation for why a masked disposition did not manifest is because some other entity prevented it from manifesting. Likewise, denying a distinction between finks and masks sacrifices predictive power: without distinguishing between cases in which an entity has lost a disposition and cases in which an entity's disposition has merely been temporarily interfered with, we cannot accurately predict whether the disposition will manifest the next time that it is stimulated.

### 5. A new proposal

I have argued that other influential accounts of masks are unable to address all of the following problems:

1. The actuality problem
2. The probability problem
3. The degree problem
4. The possession problem
5. The finkish problem
6. The simultaneous interference problem

I will spend the remainder of this paper sketching out a position which I believe addresses all six. Roughly, my proposal is that some disposition is masked just in case some entity makes it such that the disposition is less likely to manifest than it would if that entity were not present. A focus on probability means that we must examine *sets of cases* rather than *individual* cases. Before we can examine the specifics of an analysis that can address each of the above problems, we must determine the criteria necessary for membership in any such set.<sup>19</sup>

What, then, is a test case? I do not have in mind the maximally specific set of details that Manley and Wasserman (2008) propose in their account of *C*-cases. Instead, I have in mind roughly what Choi (2005) calls a ‘conditional test’:

The conditional test is roughly that whenever the following counterfactual conditional is true, we are inclined to believe that *x* has *D*: if *x* were to undergo the characteristic stimulus of *D*, it would exhibit the characteristic manifestation of *D*. Why are we inclined to think that a windowpane is fragile? The reason is that if it were struck, it would break (Choi 2005: 499).

Using the conditional test makes the criteria for test cases remarkably simple. If, for some case, the entity is exposed to the stimulus for that disposition in the circumstances for that disposition, that case is a test case. Formalizing this view, we come away with the following:

(TEST) Case *N* is a test case for *X*'s disposition to *A* as the result of *S* in *C* iff in *N*, *X* is exposed to *S* in *C*.

(TEST SET) Set *T* is a set of test cases for *X*'s disposition to *A* as the result of *S* in *C* iff for all cases *N* in set *T*, *X* is exposed to *S* in *C*.

Testing for a mask requires that we test two sets of cases: one in which the only variables held fixed are the stimulus (*S*) and the conditions (*C*), and one in which the mask (*M*), in addition to the stimulus (*S*) and conditions (*C*) is held fixed.

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<sup>19</sup> See Kittle (2015a) for an argument along these lines. Kittle argues that Vihvelin's (2013) account of dispositional abilities suffers from a lack of specificity with respect to what counts as a relevant test case for some disposition.

It should be noted that we need not, contra Manley and Wasserman (2008), examine *infinitely many* test cases in order to determine whether something has a particular disposition or whether that disposition is masked. Instead, we need only examine a suitably large set of tests, where suitability will depend on the disposition in question. If we are concerned with whether a coin's disposition to land on heads is masked, fewer test cases will be necessary than if we are concerned with a thousand-sided die's disposition to land on side #248.

Further, if we avoid commitment to the strategy of getting specific, we need not specify every surrounding detail for any given case. Suppose, for instance, that we are concerned with testing whether some glass is disposed to break when dropped in ordinary kitchen conditions. If our sole concern is with that disposition, then any case in which these minimal conditions—the glass is in the kitchen and the glass is dropped—are satisfied is eligible to be a test case for that disposition. As such, for this very broad disposition, any case in which a glass is dropped while wrapped in bubble wrap is eligible for membership in a set of test cases.

One might object that this will yield the incorrect results; our ordinary language ascriptions of 'fragile' preclude cases in which some blocking entity such as bubble wrap is present. While I agree that such cases are likely poor test cases for the ordinary language dispositional predicate 'fragile,' all that this means is that the predicate 'fragile,' if it picks out any single disposition, does not pick out the disposition to break when dropped in ordinary kitchen conditions *simpliciter*, but instead picks out a more (though not maximally) specific disposition.

We are now in a position to examine a new analysis of masks: (PDM) (short for 'Probabilistic Dispositional Masks').

(PDM):  $M$  masks  $X$ 's disposition to  $A$  as the result of stimulus  $S$  in  $C$  at time  $t$  iff:



- (1) If  $X$  were exposed to  $S$  in  $C$  at  $t$ , and if  $X$  retained the property in virtue of which  $X$  is disposed to  $A$  while remaining in the presence of  $M$  until some later time  $t'$ , then  $X$  would  $A$  less than if  $M$  were not present;
- (2)  $M$  is present at  $t$ ;
- (3)  $M$  plays a causal role in  $X$ 's decreased  $A$ -ing.

'Less' can be understood along two dimensions: in proportion or degree.<sup>20</sup>

(LESS)  $X$ 's disposition to  $A$  as the result of  $S$  in  $C$  is *less* than  $X$ 's disposition to  $A$  as the result of  $S$  in  $C'$  iff:

- (1) If  $X$  were exposed to  $S$  in  $C$ , then for some set of test cases  $T$ , and for some set of test cases  $T'$ , the proportion of cases in which  $X$  would  $A$  as the result of  $S$  is lower in  $T$  than in  $T'$ , or
- (2) If  $X$  were exposed to  $S$  in  $C$ , then for some set of test cases  $T$ , and for some set of test cases  $T'$ , the degree to which  $X$  would  $A$  as the result of  $S$  is lower in  $T$  than in  $T'$ .

Allow me to illustrate with a simple example. Suppose that a glass,  $G$ , is placed in an ordinary kitchen, and we are concerned with whether it will break *less* if it is wrapped in bubble wrap.

Given its intrinsic structure and surrounding environment, if it were dropped in its current state, it would break in 50% of cases.<sup>21</sup> Call the surrounding circumstances  $C$  and, for a set of cases in which nomic duplicates of  $G$  are dropped in  $C$ , use  $T$ .

$G$  is then wrapped in bubble wrap; its surrounding circumstances,  $C'$ , are identical to  $C$  with the one difference being the presence of the bubble wrap. Suppose that if  $G$  were dropped in  $C'$ , over a set of cases  $T'$ , it would break in 20% of cases. Condition (1) is thus satisfied, as the proportion of cases in which  $G$  would break as the result of being dropped in  $C'$  is lower than the proportion of cases in which  $G$  would break as the result of being dropped in  $C$ .

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<sup>20</sup> Note that my discussion of (LESS) resembles in part Manley and Wasserman's (2008) discussion of the predicate (MORE). Manley and Wasserman also note the two dimensions along which an entity can be more disposed to  $A$  than some other entity. Unlike Manley and Wasserman, however, I do not take it that the possibility of comparative disposition ascriptions undermines the conditional analysis. As such, I intend for the analysis of (LESS) that I offer here to be used in conjunction with a conditional analysis of dispositions.

<sup>21</sup> To say that  $G$  would break in 50% of cases is to say that for some set of nomic duplicates of  $G$ , if those duplicates were exposed to the stimulus associated with  $G$ 's disposition, the manifestation would be displayed in 50% of cases.

Alternatively, consider a case in which the protective material placed around  $G$  did not reduce the proportion of cases in which  $G$  would break as the result of being dropped, but instead makes it such that  $G$  only chips slightly as opposed to shattering entirely. Call these circumstances  $C^*$ . While (1) is not satisfied, as  $G$  would break in precisely the same number of cases in  $C^*$  as it would in  $C$ , (2) is satisfied, because the degree to which  $G$  breaks in  $C^*$  is lower than the degree to which  $G$  breaks in  $C$ .

Consider, then, how (PDM) applies to paradigmatic instances of masks:

Bubble wrap masks glass  $G$ 's disposition to break as the result of being dropped in an ordinary kitchen at  $t$  iff:

- (1) If  $G$  were dropped at  $t$  in an ordinary kitchen, and if  $G$  retained the property in virtue of which it is disposed to break while remaining wrapped in bubble wrap until some later time  $t'$ , then  $G$  would break less than if it were not wrapped in bubble wrap;
- (2)  $G$  is wrapped in bubble wrap at  $t$ ;
- (3) The presence of bubble wrap plays a causal role in  $G$ 's breaking less.

For any case in which  $G$  is wrapped in bubble wrap, each condition is true. Given the semantics for (LESS) proposed above, (1) is true just in case the presence of the bubble wrap *either* decreases the proportion of cases in which  $G$  breaks when dropped *or* decreases the degree to which  $G$  breaks when dropped. (2) is true just in case  $G$  is indeed wrapped in bubble wrap at the time in question. (3) is true just in case the first two conditions are true.

How does (PDM) fare on the problems facing an analysis of masks? First, it clearly addresses the actuality problem, as condition (1) does not require that the glass is actually dropped. Even if  $G$ , in the example above, were never dropped, it would still count as masked: if it were dropped, it would break less than it would if it were not wrapped. Second, the semantics of (LESS) proposed above allows this analysis to address the probability problem: even if, for one individual case, the glass happens not to break when dropped, the bubble wrap will still

count as a mask. Likewise, if *G* were not wrapped in bubble wrap and merely happened to take a lucky bounce, (PDM) would *not* yield the conclusion that its disposition was masked.

(LESS) also allows (PDM) to address the degree problem. Suppose that if *G* were dropped in *C* (ordinary kitchen conditions while not wrapped in bubble wrap), it would shatter in 50% of cases and remain whole in 50% of cases. Suppose further that if *G* were dropped in *C\** (ordinary kitchen conditions while wrapped in bubble wrap), it would chip slightly in 50% of cases and remain whole in 50% of cases. While the *proportion* of cases in which *G*'s disposition manifests remains the same, the masking conditions make it such that it manifests to less of a degree.

The possession problem is addressed by the requirement included in the counterfactual that there is some baseline degree to which an entity has the disposition in question. For some entity that lacks a particular disposition, the degree to which and proportion of cases in which it displays the manifestation will be the same regardless of whether there is a mask present. Rubber balls are not fragile: when a rubber ball is wrapped in bubble wrap, it will break as frequently and to the same degree (i.e. not at all) that it would if it were not wrapped in bubble wrap.

Next, consider the finkish problem. (PDM) includes a clause requiring that the properties in virtue of which the entity is so disposed do not change throughout the duration of the case; as such, cases in which an entity fails to display a manifestation characteristic of its disposition because it is finkish will not be included in the extension of (PDM).

The simultaneous interference problem is dealt with by means of condition (1). Recall that a mask might exist in the presence of a fink:

(NOVICE SORCERER) A self-conscious sorcerer worries that he will not be able to cast a spell quickly enough to stop a glass from breaking when it is dropped. He preemptively

wraps glass  $G$  in bubble wrap to preclude embarrassment. At time  $t_1$ , he prepares to drop  $G$ ; at  $t_2$ , he drops it; at  $t_3$ , he casts a spell such that  $G$  ceases to be fragile.

The problem, as described above, is as follows: the glass will cease to be fragile if it is dropped, meaning that the presence of the bubble wrap will not constitute a mask at the time at which the stimulus conditions actually obtain. On the standard description of a mask, then, the bubble wrap does not count as being masked. Yet for the moment before which it is dropped, the glass is wrapped in bubble wrap, meaning that it is masked.

Condition (1) addresses this problem by indexing a mask to a particular time period. As I have argued, the actuality problem requires that we identify a disposition as masked even if its stimulus conditions do not obtain. In (NOVICE SORCERER), whether  $G$ 's disposition to break when dropped is masked depends on which time period we examine. At time  $t_1$ , before the glass has been dropped and the spell cast,  $G$ 's disposition is masked, as condition (1) is true:

If  $G$  were dropped in ordinary kitchen conditions, and if  $G$  retained the property in virtue of which it is disposed to break when dropped while remaining wrapped in bubble wrap, then it would break less than it would if it were dropped while not wrapped in bubble wrap.<sup>22</sup>

At time  $t_3$ , however,  $G$ 's disposition is not masked: because  $G$  is no longer fragile, it would break no less in the presence of the bubble wrap than it would in conditions without the bubble wrap, rendering false condition (1). Because  $G$  loses the disposition when the spell is cast, and because (PDM) is able to overcome the possession problem, (PDM) correctly yields the conclusion that  $G$  does not have a masked disposition after the spell is cast.<sup>23</sup>

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<sup>22</sup> We can also consider a variant of this case in which the novice sorcerer would cast two spells: one causing the bubble wrap to disappear, and the other causing the glass to cease to be fragile. In such a case, similarly, condition (1) would require that we examine only nomic tests in which the bubble wrap remains present *and*  $G$ 's intrinsic properties do not change. As such, the bubble wrap would count as a mask prior to the time at which the spells are cast, but (obviously) not after.

<sup>23</sup> The proportion of cases in which  $G$  will break and the degree to which  $G$  will break is the same, after the spell has been cast, regardless of whether  $G$  is wrapped in bubble wrap. As such, the consequence of the counterfactual conditional in condition (1) is false. Note that the antecedent of the counterfactual here should *not* be read as 'if  $G$

Finally, consider one possible counterexample. In some cases, a mask might not appear until the moment at which the stimulus obtains.<sup>24</sup> Consider Bird's (1998) classic example of an antidote: a guardian sorcerer will cast a spell administering a shockwave if glass *G* is ever dropped such that the glass would not break—the shockwave counteracts the impact of the glass hitting the floor. What, if anything, should we say is a mask in this case?

Condition (2) requires that the masking state of affairs actually obtains. At time *t*, prior to when *G* has been dropped, the shockwave has not been administered, rendering condition (2) false. Yet it would seem correct to say that the shockwave is a mask, as it is true that if *G* were dropped, it would not break as a result of the shockwave's presence.

To address this seeming problem, we can distinguish between two candidates for masking states of affairs in this case. While it is true that at time *t*, the shockwave does not mask the glass' disposition to break when dropped, the *sorcerer's presence* does. Consider what we should say of the sorcerer's presence prior to a drop:

The sorcerer's presence masks glass *G*'s disposition to break as the result of being dropped in ordinary kitchen conditions at time *t* iff:

- (1) If *G* were dropped in ordinary kitchen conditions at *t*, and if *G* retained the property in virtue of which *G* is disposed to break while remaining in the presence of the sorcerer until some later time *t'*, then *G* would break less than if the sorcerer were not present;
- (2) The sorcerer is present at *t*;
- (3) The sorcerer plays a causal role in *G*'s decreased breaking.

On the semantics of (LESS) proposed above, (1) is true; in circumstances in which the sorcerer is present, the glass will not break. Unlike the shockwave itself, the sorcerer is indeed present at *t*, satisfying condition (2). The sorcerer certainly plays a causal role in *G*'s not breaking, satisfying

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*had* retained the property in virtue of which it is disposed to break when dropped,' as such a reading would render the counterfactual true. Thanks to an anonymous referee for help clarifying this point.

<sup>24</sup> Thanks to an anonymous referee for raising this objection.

condition (3). Examining the case at a later time, such as the moment just after which the sorcerer has cast his spell, might yield a different conclusion, but for the moment prior to which  $G$  is dropped,  $G$  is properly counted as masked.

## 6. Conclusion

I have offered a new analysis of dispositional masks, (PDM), which is able to address a number of problems surrounding other analyses of dispositional masks. Chief among them is the problem with determining the breadth of the *ceteris paribus* clause necessary for making less than perfectly specific dispositional ascriptions. A key challenge to the simple conditional analysis is that of excluding all masks from the antecedent of the counterfactual in the *analysans* without circularity and without listing out infinitely many possible masks. One way of doing so is by incorporating this analysis of masks into the antecedent of the counterfactual: if  $X$  were exposed to  $S$  while not in the presence of a mask, then  $X$  would  $A$ , where whether  $X$  is in the presence of a mask is determined by whether anything in  $X$ 's presence satisfies the criteria for masking in (PDM).

Beyond addressing interesting questions about what masks are and how they relate to conditional analyses of dispositions, the analysis which I have proposed here can take steps towards adjudicating problems in the application of dispositions to other debates in metaphysics. In the free will debate, for instance, a dispositional account of free will requires an account of when an agent's rational abilities were masked and when they were not. Whittle (2010) and Kittle (2015a) have both argued that Vihvelin's (2004, 2013) analysis of free will cannot adequately address the issue of masking. Similarly, in the literature on skill, Riley (2017) has argued that Stanley and Williamson's (2017) analysis of skill cannot overcome the problem of

masks. Both of these issues, as well as the many other issues raised in the literature on masks, require far more discussion than I can offer here, but a proper analysis of dispositional masks can bring us a step closer to solving those problems.

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