

The Counterexample Fallacy

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Manley and Wasserman (2008) join the chorus of opposition to the possibility of conditional analysis of dispositions. But that score cannot be settled without more careful attention to the implicit philosophical methodology. Some of the opposition to such an analysis badly overestimates the effect of counterexamples, as if the Gettier example were sufficient to refute the possibility of conjunctive analysis of knowledge. A general objection to a form of analysis must satisfy a number of constraints, and Manley and Wasserman join the chorus too in failing to satisfy them. Most significant is the optional presupposition that the conditional used in analysis will exhibit some sort of centring. We show that even a careful effort to repair and reform Manley and Wasserman's objection to provide a satisfactory argument requires, ultimately, appeal to centring. Worse, the particular positive proposal they offer is vulnerable to a minor variant of their own counterexample.

1. How to do things with counterexamples

The 'conditional fallacy' literature has endowed us with a delightful bestiary of counterexamples: electrofinks,¹ shy but intuitive chameleons,² divine agents (and sorcerers and angels) protecting crystal glasses,³ glasses packed in styrofoam,⁴ poisons and antidotes,⁵ kazoos

¹ Martin 1994, pp. 2–3.

² Johnston 1992, p. 231.

³ Martin 1994, p. 1 and Johnston 1992, p. 232.

⁴ Johnston 1992, p. 233.

⁵ Lewis 1997, p. 153 and Bird 1998, p. 228.

with wax-coated reeds,⁶ Killer Yellows,⁷ barrels wedged with bricks,⁸ the Hater of Styrofoam,⁹ and of late, thanks to Manley and Wasserman 2008, concrete blocks with Achilles' Heels. Manley and Wasserman join the chorus of the philosophical orthodoxy in holding that these counterexamples doom the project of analysing dispositions in terms of conditionals:

Despite its early popularity ... we now know the simple account is far too simple. It founders on C. B. Martin's *problem of finks*. (Manley and Wasserman 2008, p. 60)

The bestiary represents an impressive bit of philosophical specimen-gathering, but while we admire the fieldwork, we want to observe that the methodology that underwrites the move from the counterexamples to the declarations of doom is hasty.

First Methodological Observation: Counterexamples must be deployed as counterexamples to *specific proposals*. The example of a glass packed in styrofoam can perhaps show that *fragile* cannot be analysed as *would break if struck*, but it shows nothing about a proposed analysis of *fragile* as *would break if struck when unwrapped*, and *certainly* shows nothing about any proposed analysis of a different dispositional term, such as *irascible*.

Counterexamples refute proposals, more or less, one at a time. That is a fine thing to do—many proposals are wrong, and ought to be abandoned; a counterexample which helps us see that is to be celebrated. But that one analysis fails shows us, in itself, nothing about the next. There are a lot of dispositions to be analysed, and a lot of ways of giving conditional analyses of each, so even a rather expansive bestiary is not going to be up to the task of showing that the entire strategy of analysing dispositions into conditionals must fail. While they can refute specific instances of a style of theory, counterexamples are not in themselves to the style as a whole. Instead, they are tools for refinement, allowing a better choice of specific instance of that style to be endorsed. Experimental counterexamples to existing scientific theories do not threaten the very project of producing a scientific account of the world, but rather aid that project, by allowing refinement of

⁶ Fara 2004, p. 51.

⁷ Due to Saul Kripke, via Lewis 1997, p. 145.

⁸ Fara 2004, p. 54.

⁹ Due to Daniel Nolan, via Lewis 1997, p. 153.

the endorsed theory. Similarly, unless more is said, counterexamples to specific conditional analyses of dispositions are just tools for producing better conditional analyses.

To convert a collection of counterexamples into a strategy for attacking an entire style of analysis, it is necessary to produce a *general recipe* for the production of counterexamples. The recipe we produce must avoid begging the question. This suggests a second methodological point:

Second Methodological Observation: A persuasive general recipe for rejecting a style of analysis must amount to more than a brute commitment to producing counterexamples to each instantiation of the style. The general project of analysing dispositions into conditionals cannot persuasively be rejected by holding out the global prospect of producing ‘fink’-style counterexamples, if those counterexamples amount to nothing more than cases in which the disposition is present, but the analysing conditional is absent (or vice versa). You cannot convince someone to abandon a philosophical position *simply* by saying that you will produce a counterexample to each instance of that position. Rather, some positive reason must be given for thinking that the counterexamples will always be forthcoming.

A persuasive version of the ‘conditional fallacy’ argument must thus identify a systemic problem, one which will survive any refinement and thus always give rise to new counterexamples. Given that the target is the *conditional* analysis of dispositions, the systemic problem must spring from the very nature of conditionality, and some unsuitability of that nature for the treatment of dispositions. But identification of such a systemic problem does not emerge as a focus of the conditional fallacy literature.

Consider an analogy. An epistemologist might put forward, in succession, the following two ‘conjunctive analyses’ of knowledge:

- (1) S knows that p iff S believes that p , and p is true
- (2) S knows that p iff S believes that p and S’s belief that p is justified, and p is true

The first analysis falls to well-known counterexamples of lucky guesses, and in response the more refined second analysis is proposed. It in turn falls to the counterexamples presented in Gettier cases. Neither of the two proposed analyses survives confrontation with

the counterexamples, but it would be absurd, on the basis of these two counterexamples, to announce the discovery of a ‘conjunctive fallacy’ in efforts to analyse knowledge. *Maybe* all future conjunction-employing analyses of knowledge will fail, but so far *absolutely no reason* has been given to think that this is the case.¹⁰

Advocates of the ‘conditional fallacy’ thus face an important *Targetting Challenge*. A successful attempt to argue that conditional analyses of dispositions commit a systematic *conditional* fallacy must show why counterexamples specifically target the conditionality of the analyses in a way in which counterexamples to sundry conjunctive analyses of knowledge do not target the conjunctivity of those analyses. So long as it is possible to parallel the putative ‘conditional fallacy’ with a symmetric ‘conjunctive fallacy’, no persuasive argument can have been given.

The above challenge is a difficult one to meet, and meeting it has rarely been a priority in the literature. However, although the details of such arguments are surprisingly subtle, it is possible to construct generalized conditional fallacy arguments. The resulting generalized masking and mimicking arguments exploit putative mismatches between the inferential features of conditionals and the inferential features of dispositional terms. It is thus crucial not to approach the question of the relation between dispositions and conditionals with an overly constrained view of the possible logics for conditionals.

Third Methodological Observation: Philosophical discussions of conditionals should not assume that the logical options are limited to the material conditional, the C. I. Lewis strict conditional, and the Lewis/Stalnaker variably strict counterfactual conditional.

Discussions of the relation between conditionals and dispositions tend to presuppose that the conditional in question is not just the Lewis/Stalnaker counterfactual, but the particular Lewis logic VC, which includes the semantic constraints of *weak* and *strong centring*, with their related inferential features.¹¹ But these conditionals do not

¹⁰ Craig 1990 (esp. Ch. 9) seeks, along these lines, a general objection to analyses of knowledge that conjoin a third condition to true belief. It is also possible that knowledge simply cannot be analysed, and *a fortiori* cannot be conjunctively analysed. But this is not the type of worry on offer here, which assays an accusation of fallacy meant to cut selectively against one style of analysis.

¹¹ A Lewis/Stalnaker conditional is *weakly centred* if each world is a member of the minimal sphere of the sphere system for that world; it is *strongly centred* if each world is the only

exhaust logical space, and if generalized conditional fallacy arguments turn crucially on inferential features native to these choices, those arguments can be taken simply to show that dispositions are best analysed using a conditional with a different logic.

Masking and mimicking arguments require the centring assumptions that Lewis imposes on his counterfactual conditional, and are toothless against an uncentred conditional. We thus add one bit of counsel to accompany the sundry methodological observations. One should *Beware Centring*: when confronted with a ‘conditional fallacy’ argument, watch for covert appeals to centring.

We will have opportunity to return twice to this counsel in the discussion below, but first a brief case in point. The fifth of Manley and Wasserman’s ‘five additional problems’ for conditional analyses of dispositions is that of ‘absent stimulus conditions’.¹² Manley and

member of that minimal sphere. Imposing the model-theoretic constraint of weak centring yields a conditional which supports the inferential features:

Modus ponens: from p and $\text{if } p, q$, infer q

Contraction: from $\text{if } p, \text{if } p, q$, infer $\text{if } p, q$

Imposing strong centring yields a conditional which supports the inferential features:

Easy Conditional Introduction: from p and q , infer $\text{if } p, q$

Expansion: from $\text{if } p, q$, infer $\text{if } p, \text{if } p, q$

¹² We discuss the first and second problems in detail *infra*. The third and fourth problems we set aside, since they are not, in fact, problems for a conditional analysis of dispositions. The third ‘problem’ is that of accounting for comparative dispositional ascriptions; the fourth that of accounting for the context-dependency of dispositional ascriptions. Very briefly:

- (1) A theory of categoricals need not also be a theory of comparatives. Imagine an analysis of *tall* according to which it is a matter of measuring at least six feet in height. While such an analysis is inadequate in many respects, it is no objection to it that it does not note, predict, or explain that some things are taller than others. The comparative *taller* has its own analysis, which is separate from but compatible with that of *tall*. Absent some reason to think that a conditional analysis of dispositions actively hinders the provision of an independent analysis of dispositional comparatives, the very real fact that some glasses are more fragile than others is nothing more than an adversion to a further project. Even the (harmless) need to acknowledge a further project may be eliminable—Kamp 1975 shows how theories of comparatives can be constructed as off-shoots of theories of categoricals; pursuit of this strategy could directly yield the requested account of dispositional comparatives.
- (2) Similarly with context dependence—perhaps no one has suggested a plausible mechanism for the context dependence of dispositional predicates, and perhaps this is to be lamented. But absent some reason to think that such a mechanism would have to be *incompatible* with treating dispositions as conditionals, the failure yet to specify the mechanism is no objection to the conditional (or any other)

Wasserman suggest that some dispositions, such as *irascibility* or *loquacity*, are not associated with any ‘particular set of stimulus conditions’ (p. 72)—that (for example) the loquacious man may just be one who *tends to talk*, whatever the circumstance. This suggestion is questionable twice over. First, Manley and Wasserman fail to distinguish *thin and readily available* stimulus conditions from the absence of stimulus conditions. The loquacious man talks given any even minimally talk-apt situation—he cares not, or little, for the natural balance of conversational time-sharing or for whether others are interested in his thoughts. But he does not talk while asleep, or unconscious, or listening raptly to a symphony (or, if he does, it is a symptom not of loquacity, but of some pathology). Second, dispositions are one member of a family of characteristics that also includes tendencies, inclinations, propensities, likelihoods, habits, temperaments, proclivities, and biases. There are subtle differences among the members of this family, and the advocate of conditional analyses of *dispositions* need not hold that every member of the family admits similarly of conditional analysis. A precondition for an interesting problem of absent stimulus conditions is thus the making of a case that the relevant traits are genuinely *dispositional*, rather than some other family member.

But set aside these worries and accept that there are dispositions with absent stimulus conditions. Manley and Wasserman then consider the obvious suggestion that such dispositions simply have vacuous, or tautological, stimulus conditions, and hence are to be analysed using conditionals of the form *if (tautology) then (manifestation)*. In response, they say:

The conditional ‘If he were in any situation at all, he would talk’ has two readings, neither of which will serve our purposes. On one reading it is too strong (requiring that every situation is such that he would talk in it) and on another it is too weak (requiring only that he talk in the closest world in which any situation obtains; i.e. the actual world). (p. 73)

account. We note in passing that Manley and Wasserman’s own positive account of the mechanism fails—context-dependency of dispositional predicates cannot be a matter of selecting a threshold for an underlying comparative, since the dimensionality of the context-sensitivity outruns that of the comparative. An aerospace engineer, when calling a material fragile, has in mind its behaviour at high temperatures on re-entry, while a sculptor, when calling a material fragile, has in mind its tendency to shatter when chiseled. Neither engineer nor sculptor is using *fragile* to mean *more fragile* than the other; they are instead focusing on different aspects of a complex range of fragility-relevant features.

The proposed two readings are those given by a strict conditional (which then requires the manifestation in every tautology-supporting, and hence absolutely every, possible world) and the Lewis counterfactual with strong centring (which requires the manifestation in every *closest* tautology-supporting world, and hence at every absolutely closest world — combined with the strong centring assumption that the actual world is the unique member of the minimal sphere, the requirement is only that the manifestation occurs at the actual world). But the strict conditional and the strongly centred Lewis counterfactual are not the only two possible conditionals (even the *weakly centred* Lewis counterfactual does not support the argument Manley and Wasserman run). If we avoid an unjustified constraining of logical options, there is no reason to think that absent-stimulus dispositions, if there are any, do not yield to analysis by vacuous-antecedent conditionals.

2. How not to do things with counterexamples

Manley and Wasserman 2008 adds a new counterexample to the conditional fallacy argument, but what does it add to the dialectic state of play? Very little, as we will see. They set the scene for their novel counterexample by endorsing what they call the ‘getting-specific’ manoeuvre. This manoeuvre is most helpfully decomposed into two stages. In the first stage, we replace a monadic dispositional term such as *poisonous* with a more specific (or at least explicit) relational dispositional ascription such as *disposed to cause death when ingested*. This stage in getting specific originates in Lewis (1997), which takes this stage of specification to be simply the replacement of one (monadic) name for a disposition with another (relational, and analytically more helpful) name for the same disposition:

So the first problem we face in analysing any particular dispositional concept, before we can turn to the more general questions that our particular example was meant to illustrate, is the problem of specifying the stimulus and the response correctly. (Lewis 1997, p. 153)

Of course, the first stage of getting specific must be done correctly, and the first relational specification that springs to mind may not be the best one:

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’. Yet the need for this correction to the analysis of ‘poison’ teaches no lesson about the analysis of dispositionality in general. (p. 153)

But at some point, this first stage is completed, and we have respecified the dispositional target of analysis in relational terms, and are ready to proceed to the provision of a conditional analysis.

At this point, Manley and Wasserman insert a novel second stage in the getting specific manoeuvre. Having replaced the monadic dispositional term *d* with the relational *disposed to m when c*, we then reject the obvious conditional proposal:

O is disposed to *m* when *c* iff if *O* were *c*, then it would *m*

in favour of an alternative conditional analysis in which *c* is replaced by some *hyper-specific* conditions of manifestation. So, in particular, Manley and Wasserman propose that the disposition to break when struck (the relational replacement, via the first stage of getting specific, for the monadic dispositional feature of *fragility*) be analysed by the hyper-specific conditional:

If *M* were dropped on Earth from exactly one metre onto a surface with a Shore measurement of exactly 90A, through a substance with a density of exactly 1.2 kg/m³, *M* would break

Note that the proposed second stage addresses not the proper formulation of the *target* of analysis (as the first stage does), but rather suggests an approach to providing the actual analysis.

The hyper-specific second-stage analysis is then the target of Manley and Wasserman’s ‘Achilles’ Heel’ objection. Manley and Wasserman ask us to

consider a concrete block that, like Achilles, is almost entirely immune to harm ... But like Achilles, the block has a weak spot. If it is dropped onto a *particular* corner at *just* the right angle with *exactly* the right amount of force, an amazing chain reaction will cause it to break. (Manley and Wasserman 2008, p. 67)

As luck would have it, the corner, angle, and force in question happen to match perfectly the hyper-specific conditions employed in the posited hyper-specific conditional analysing *disposed to break when struck*.¹³ On the assumption that the block (given its almost complete

¹³ In fact, Manley and Wasserman are not, on their own grounds, entitled to exploiting corner and angle of impact in the specification of an Achilles’ Heel, since their preferred hyper-specific conditions of manifestation do not constrain these aspects of the scenario, but only location and height of dropping, density of medium dropped through, and hardness

immunity to harm) is *not* fragile, we then have a counterexample to the hyper-specific analysis of fragility—the block mimics fragility, satisfying the proposed analysing conditional without possessing the disposition. Manley and Wasserman also discuss reverse Achilles' heels, in which (for example) a fragile object masks its fragility by having an aspect of *invulnerability* which just happens to line up with the hyper-specific conditions of manifestation used in analysis.

Achilles' and reverse Achilles' Heels teach us no interesting lessons about the prospects for conditional analysis of dispositions. There are two central points to make about Manley and Wasserman's style of counterexamples.

First, a particular (reverse) Achilles' Heel example refutes a particular hyper-specific dispositional analysis (the First Methodological Observation). But all this serves to show is that that hyper-specific analysis was not a good one. And can this truly come as a surprise? Surely the idea that (for example) fragility was to be analysed as a conditional relation between impacting a surface of precisely 90A Shore measurement (not 95? not the D scale rather than the A scale?) never had even *prima facie* plausibility, so that such an analysis can be counterexampled is only to be expected. *Of course* an object can be such that it would break under *exactly these* conditions without being fragile, because these are not the right conditions to test.¹⁴ A proposal that *M is fragile* analyses into *If M were painted blue, it would break* is also easily counterexampled; the same (lack of) interesting philosophical consequence flows from each case.¹⁵

Second, since the hyper-specific analyses seem to us systematically misguided, we are happy to agree that (reverse-)Achilles'-Heel-style counterexamples are even systematically available for such analyses.

of surface of impact. They thus require a block which has (e.g.) a particular hardness of impact surface as an Achilles' Heel, or a different conception of hyper-specific conditions of manifestation.

¹⁴ What are the right conditions? We would suggest, roughly, *being struck*, but the full defence of this proposal then requires a detailed analysis of the original masking and mimicking arguments.

¹⁵ Manley and Wasserman suggest that their hyper-specific conditions are distinguished by being 'Absolutely paradigmatic for fragility ... precisely the sort of conditions that we would not want to rule out by tinkering with the antecedent of the conditional any further' (p. 68). But the honorific of 'paradigm' is at odds with the dispositional ascriptions that Manley and Wasserman's counterexamples require—if *exactly these* are paradigm conditions for manifesting fragility, surely the breaking of an object in these conditions is decisive for its being fragile. (Of course, we do *not* count the breaking in Manley and Wasserman's conditions as decisive of fragility, but that is just because those conditions are not paradigmatic.)

However, we note that Manley and Wasserman have not given any generic reason for thinking that the counterexamples are available, so we see no reason why someone who favours a hyper-specific analysis strategy should be worried by Achilles' Heels. (We accept the availability of counterexamples because we reject the style of analysis, not the other way around.) Manley and Wasserman have, in the end, given us nothing more than the dialectically unacceptable brute commitment to producing a counterexample to every proposed (hyper-specific) analysis, without reason to think that they can fulfil that commitment (the Second Methodological Observation).

3. How one might have done something with a counterexample

Manley and Wasserman aim at providing not *just* a new counterexample, but a general recipe for overturning conditional analyses of dispositions:

Achilles' heels provide a recipe for generating counterexamples to any analysis that invokes a conditional like (EC). For every fully precise condition relevant to the manifestation of fragility, there will be a possible block with an Achilles' heel that would break in exactly that scenario without being fragile. (Manley and Wasserman 2008, p. 68)

As noted above, however, Manley and Wasserman's specific recipe fails to create a serious threat to a project of conditional analysis, both because it relies on an unsupported assumption that the necessary counterexamples are always forthcoming, and because it aims at a bad target: the hyper-specific conditional analyses. However, there is an interesting, and ultimately informative, method of redirecting Achilles' Heels toward the entire project of conditional analyses of dispositions. In this section we suspend, *arguendo*, worries about the generic availability of Achilles' Heel counterexamples to hyper-specific analyses, and then construct and discuss an argument utilizing those counterexamples.

Suppose we want to analyse some disposition in terms of a (non-hyper-specific) conditional. We will use the analysis of *M is fragile* as if *M were struck, it would break* as an example, but nothing will depend on the details of the example. We begin with the following thought:

(First Draft Objection)

The stimulus condition *M is struck* is logically equivalent to a massive (perhaps infinite) disjunction of hyper-specific stimulus conditions, enumerating all the hyper-specific modes of striking.

The analysis thus entails the massive disjunction of hyper-specific analysing conditionals of the form *If M were struck in such-and-such manner, it would break*. But since (reverse-)Achilles'-Heel-style counterexamples can be levelled against each disjunct, the disjunction is false, and by *modus tollens*, the proposed conditional analysis fails.

The contemplated objection thus plays off the following inferential feature of the conditional:

$$(A \vee B) \Rightarrow C \text{ implies } (A \Rightarrow C) \vee (B \Rightarrow C)^{16}$$

However, the first draft of the objection moves too quickly. There is a quantifier scope issue here that requires some care. Manley and Wasserman's Achilles' Heel cases give us:

For each hyper-specific stimulus condition, there is some possible object which has that condition as its (reverse) Achilles' Heel [$\forall C \diamond \exists x (\neg D(x) \ \& \ (C(x) \Rightarrow M(x)))$], where *D* is the disposition, *M* is the manifestation of the disposition, and *C* ranges over hyper-specific stimulus conditions]

These cases do not, however, give us:

There is some possible object that for each hyper-specific stimulus condition has that condition as its (reverse) Achilles' Heel [$\diamond \exists x \forall C (\neg D(x) \ \& \ (C(x) \Rightarrow M(x)))$]

Nor could they, on pain of implausibility, since there is no reason to accept even the metaphysical possibility of an object which, although not fragile, would break *no matter how it was struck*.

Somewhat more carefully, if the hyper-specific analyses are read as *for all objects x, x is fragile iff if x were struck in such-and-such manner, x would break*, then each hyper-specific analysis is indeed falsified. But the original analysis, put in quantified form—*for all objects x, x is fragile iff if x were struck, x would break*—does not

¹⁶ We use the symbol \Rightarrow for the conditional of analysis to emphasize that the project of conditional analysis is not wedded to any particular conditional logic (the Third Methodological Observation). It is not inevitable that a conditional support the stated inference principle—the denial of *proximity* or *boundedness* or the endorsement of a threshold rather than universalizing conditional will all allow for its rejection.

entail the disjunction of the universally quantified hyper-specific conditionals:

$$\Box \forall x \Box (F(x) \leftrightarrow (S_1(x) \Rightarrow B(x))) \vee \dots \\ \vee \Box \forall x \Box (F(x) \leftrightarrow (S_n(x) \Rightarrow B(x)))$$

but rather the universal quantification of the disjunction of the hyper-specific conditionals:

$$\Box \forall x \Box ((F(x) \leftrightarrow (S_1(x) \Rightarrow B(x))) \vee \dots \vee (F(x) \leftrightarrow (S_n(x) \Rightarrow B(x))))$$

Only the second of these is falsified by the falsity of the collection of hyper-specific analyses (read as above), so the (proper) first reading of the entailment provides no route to a threat to the original analysis.

So the many hyper-specific disjuncts are not each refuted, but rather each fail *for some object or other*—there is thus yet no reason to think that the *original* analysis fails for any object. The situation requires the compossibility only of:

- (1) *Necessarily, for all objects x , x is fragile iff if x were struck, x would break*
- (2) *For each hyper-specific manner of striking, a claim of the form: Possibly, there is an object x such that x is not fragile but if x were struck in such-and-such manner, x would break*

But these claims *are* compossible on many conditional logics, including that of the Lewis/Stalnaker counterfactual.

Still, a second draft version of the argument can be constructed. Pick some particular hyper-specific manner of striking (call it being struck *thusly*). By hypothesis, there is some possible object which has striking *thusly* as its Achilles' Heel—that is, there is some possible object which is not fragile, but which is such that if it were struck *thusly*, it would break. Now consider a world in which that possible object is indeed struck *thusly*. How will events proceed in that world? Not in any interesting way unless the world of striking *thusly* is also a world in which being struck *thusly* is a Heel of the object. To ensure this, we need to bring striking and Heel together into a single possibility. We need to move from the combination of:

It is possible that the object is not fragile but is such that if it were struck *thusly*, it would break [$\Diamond(\neg F(a) \ \& \ (S_t(a) \Rightarrow B(a)))$]

and:

It is possible that the object be struck *thusly* [$\Diamond S_t(a)$]

to the joint possibility claim:

It is possible that the object be not fragile, be struck *thusly*, and be such that if it were struck *thusly*, it would break [$\Diamond(\neg F(a) \ \& \ S_i(a) \ \& \ (S_i(a) \Rightarrow B(a)))$]

However, there is no plausible principle for moving from the individual possibilities to the joint possibility—in particular, no plausible principle of recombination can license the move, since the individual possibilities are both inferentially interrelated and (in one case) modal.

If, however, we charitably just grant the needed joint possibility, we are left with a world in which there is a non-fragile object which is struck *thusly*, and which is such that if it were struck *thusly*, it would not break. So by *modus ponens* for the analysing conditional,¹⁷ the object breaks. But since it is struck *thusly*, it is *a fortiori* struck. We thus have an object which is struck and which breaks, and which is not fragile. A contradiction would result (refuting the proposed conditional analysis) if we could move from the conjunctive fact that the object is struck and breaks to the conditional fact that if it were struck, it would break. The *strong centring* of the conditional permits exactly this inference.

Situated in the proper logical structure, Manley and Wasserman's class of Achilles' Heel cases can (given enough auxiliary assumptions) provide the foundation for a *general* argument against conditional analyses of dispositions. However, once that general argument is given, we can see that the argument turns crucially on a strong and controversial inferential feature of the conditional. Rather than abandon the conditional analysis, then, we can instead abandon the controversial inferential feature, and use non-centred conditionals in the analysis of dispositions.

Once spotted, appeals to centring in 'conditional fallacy' arguments seem to proliferate rapidly. Thus consider Manley and Wasserman's presentation of *Martin's (1994)* electro-fink example:

Martin invites us to consider an 'electro-fink'—a device that attaches to a dead wire and monitors whether a conductor is about to touch the wire. Were such contact to occur, the fink would instantaneously render the wire live: that is, the fink would confer on it the disposition to conduct electricity if touched by a conductor. And the wire would then conduct electricity. (Manley and Wasserman 2008, p. 60)

¹⁷ An inferential feature which is backed by the weak centring of the conditional.

In the final sentence of this presentation, Manley and Wasserman move from the claim that *if the wire were touched, it would be disposed to conduct electricity* to the claim that *if the wire were touched, it would conduct electricity*. From the perspective of a conditional analysis which treats *M is disposed to conduct electricity if touched* as *if M were touched, M would conduct electricity*, this move is a move from *if the wire were touched, it would be such that if it were touched, it would conduct electricity* to *if the wire were touched, it would conduct electricity*—an instance of the schematic inference from $A \Rightarrow (A \Rightarrow B)$ to $A \Rightarrow B$. This inferential pattern of *Contraction* plays a central role in conditional fallacy arguments. Its validity is a consequence of the *weak centring* of the conditional.

4. One more thing to do with a counterexample

Our primary focus throughout has been to emphasize the need for argumentative humility with counterexamples. But this focus should not cause us to lose respect for what counterexamples *can* do: refute particular proposals. As a final case in point, we show that the Achilles' Heel cases that Manley and Wasserman introduce refute the positive analysis of dispositions given in [Manley and Wasserman 2008](#).

Manley and Wasserman offer the following analysis:

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

where a C-case is a 'precise combination of values for heights, Shore measurements, densities of the medium, and so on' (pp. 74–5) — so, more generally, a precise specification of some conditions supposedly paradigmatically relevant to the manifestation of the disposition in question. There is, of course, much work to be done here in filling out the notion of a 'suitable proportion' and in imposing a metric on the presumably infinite range of C-cases, but these details will not matter to the use of Achilles' Heels in refuting the proposal.

Manley and Wasserman's proposal builds in twin (but, as we will see, still insufficient) safeguards against Achilles' Heels. First, (PROP) uses a restricted 'would' modal. Manley and Wasserman will concede that for each C-case, it is at least *metaphysically possible* that N be disposed to M when C, but not M when C (because N has, in that possible world, C as an Achilles' Heel). A restricted modal, however, screens off such possibilities as irrelevant, since (given the nature of N

in the actual world) the possibilities in which N has C as an Achilles' Heel are, for the most part, more distant than those in which N does not have C as a Heel, and hence properly manifests the disposition when C. The restricted modal thus guards against the mere possibility of Achilles' Heels. Secondly, (PROP) uses a less-than-universal quantification over instances of this restricted modal. This quantification guards against the problem of accidental closeness—while the restricted modal screens off some possibilities as irrelevant, it *can* happen that an object is such that some of its Achilles'-Heeled worlds fall within the ambit of the restricted modal. With a less-than-universal requirement on the success of the restricted modal, the occurrence of some such accidents is compatible with the presence of the disposition.

It is thus tempting (especially in light of Manley and Wasserman's earlier discussion) to read the proposal as equivalent to:

(PROP*) N is disposed to M when C if and only if some suitable proportion of C-cases are such that if that C-case were to obtain, N would M

But despite the twin safeguards, any success of the analysis still depends on an accident of the position of the actual world in modal space, and it is straightforward to construct a scenario in which that accident is remedied and the analysis fails. Imagine a non-fragile block which has a single Achilles' Heel—when it is dropped from a *particular* height through a *particular* medium onto a surface of a *particular* hardness, it breaks, but otherwise it survives unscathed. As things stand, this Heel does not make it, according to (PROP), fragile, because this one C-case does not make a suitable proportion. But now imagine that this block has an Apollo machine installed next to it.¹⁸ The Apollo machine catches the block whenever it is dropped (from any height, through any medium, onto a surface of any hardness), and moves the block to a *particular* height above a surface of a *particular* hardness and releases it. The block then falls, triggering its Heel, and breaks. So were the block dropped in *any* C-case it would (due to the intervention of the Apollo machine) break. Thus by any standard of suitable proportion, the block breaks when dropped in a suitable proportion of C-cases, and is, according to (PROP), fragile. But *ex hypothesi* the block is not fragile, so (PROP) fails.

¹⁸ The deity himself directs aright
Th' invenom'd shaft; and wings the fatal flight. (*Metamorphoses* 12.609)

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