The material inadequacy of actualist dispositionalism

**Abstract** This paper explores the role played by the temporal scope of first and second-order quantifiers in dispositionalist accounts of modality. After introducing two varieties of dispositionalism, *strong* and *weak* dispositionalism, I show that the most common form of dispositionalism entails (4) only if it entails (5) as well. The entailment, however, follows not from the notion of a power, but from certain antecedent decisions concerning the scope of quantification – decisions that render the theory itself materially inadequate.

Keywords: dispositionalism; powers; actualism; interpretations of quantifiers; modality.

# **1 Introduction**

*Dispositionalism* about modality grounds metaphysical possibility and necessity in the powers of actual things. Though dispositionalist accounts have arguably been around since Aristotle, they’ve received renewed attention in recent literature on the topic.[[1]](#footnote-1)

This paper examines the interaction between modal axioms and quantifier scope in dispositionalist accounts, particularly as it pertains to the *temporal* range of actualist quantification. Doing so reveals serious inadequacies in dispositionalist modal theories that adopt *eternalist* *actualism*, i.e. the assumption that actualist quantifiers range over all past, present, and future objects.

I begin with an explanation of what actualism is, along with its relations to possibilism, dispositionalism, and eternalism. From here, I discuss the impact of second-order quantifier scope over powers on the modal axioms available to the dispositionalist. Lastly, I show the material inadequacy of tenselessly actualist dispositionalism.

# **2 Preliminaries**

*Actualism* is the view that all and only actual entities exist (Plantinga 1974, 1976; Adams 1981). This statement is often meant in two closely related, albeit distinct senses: first, as a metaphysical statement about the existence of objects; second as a statement about the appropriate range of existential and universal quantifiers (Linsky and Zalta 1994: 436). According to the first sense, to be is to be actual; according to the second, the existence of objects is appropriately captured by existential quantification – to be is to be the value of a bound variable (Quine 1948). In this way, actualism is contrasted with *possibilism*, according to which possible objects exist *in sensu stricto* (Lewis 1986, Tomberlin 1996); and with the adoption of possibilist quantification, whether used to express ontological commitment or not. One may be an actualist in one sense without being one in the other, though the acceptance of actualist quantification is often motivated by the adoption of metaphysical actualism.

The distinction between *presentism* and *eternalism* in discussions of time parallels that between actualism and possibilism in discussions of modality (Noonan 2013). According to presentism, only present objects exist – to be is to be present; while on the eternalist view, past and future objects exist no less than present objects. As in its modal analogue, these metaphysical views may be reflected in the adoption of presentist (tensed) or eternalist (tenseless) quantification (Prior 2003, Baron 2015).

*Modal Actualism* holds that only actual entities may serve as truthmakers for modal claims. Hence, though modal actualists accept that there are true modal claims, they deny that non-actual objects – mere *possibilia*, as it were – can factor into these claims. While some varieties of modal actualism restrict the range of objects available, and hence the possibilities genuinely available in one’s first-order modal theory,[[2]](#footnote-2) others attempt to dodge these restrictions in one of two ways: by stuffing proxies for *possibilia* into the actual world, or by adopting a nonstandard reading of the existential quantifier in modal contexts[[3]](#footnote-3) – in short, either diluting the primary sense of ‘actualism’ by reading ‘exists’ in a nonstandard way, or its secondary sense by reading the existential quantifier in a nonstandard way.[[4]](#footnote-4) Dispositionalism is typically classified among the former, more restricted varieties of actualism (Contessa 2010; Vetter 2011).

The dispositionalist differs from most other actualists in two major respects. First, because dispositionalist modality tracks powers *to bring about*, the dispositionalist requires certain states, and thus some of the beings and properties involved in those states, to move from being non-actual to being actual, and vice versa. Second, unlike other actualists, the dispositionalist completely rejects the appeal to possible worlds, even as a heuristic. Whatever the kind of possibility under discussion may be, possibilities are *intra-worldly* possibilities to become actual within the order of things as they stand.

Dispositionalists typically presuppose some form of realism about the referentsof first order predicates, and are nearly unanimous in taking dispositions to be properties of some sort (cf. Pruss 2002; Martin 2008; Contessa 2015). Because of this, dispositionalist accounts of modality are standardly divided into two kinds: one Platonic, the other Aristotelian (Fitch 1996; Jacobs 2010: 234-238; Cf. Bennett 2006). Broadly, a Platonic theory takes properties to be abstract objects, and equates an object *o*’s having a property *P* with *o*’s bearing the appropriate relation – instantiation, participation, or what have you – to *P*. An Aristotelian approach, in contrast, might take properties to be *tropes*, as in Martin 2008; or *universals*, as in Armstrong 1997. In the Platonic account, properties, being abstract, do not depend for their existence on concrete particulars, though they may depend on them for their being instantiated. Aristotelian theories, by contrast, take only instantiated properties to exist.

Yates 2015 makes a further distinction between *strong* and *weak* dispositionalism. *Strong dispositionalism* posits the following as translation schemata for possibility and necessity, respectively:

POSS1: ♢*p* ≡ ∃ϕ⟩[*p*](ϕ)

NEC1: □*p* ≡ ~∃ϕ⟩[~*p*](ϕ)

*Weak dispositionalism*, by contrast, takes the equivalences to be as follows:

POSS2­: ♢*p* ≡ {*p* v ∃ϕ⟩[*p*](ϕ)}

NEC2: □*p* ≡ {p & ~∃ϕ⟩[~*p*](ϕ)}

In philosophers’ English, strong dispositionalism states that *p* is possible iff there is some power ϕ satisfying the predicate ‘able to bring it about that *p*’, symbolized as ⟩[*p*]; while weak dispositionalism takes *p* to be possible iff either this condition is satisfied or *p* is true. Accordingly, strong dispositionalism takes a proposition *p* to be necessary when there is no power that can prevent *p*’s being so, while weak dispositionalism requires that, in addition, *p* be true. Weak dispositionalism is motivated by the claim that certain necessary truths cannot be explained in terms of powers: nothing brings about that 2+2 = 4, nor does anything bring about its negation.[[5]](#footnote-5) In both strong and weak dispositionalism the modal operators are interdefinable in the usual way.

It is standard to think of powers in terms of empowered particulars,[[6]](#footnote-6) such that

∃ϕ⟩[*p*](ϕ) ≝ ∃x∃ϕ{ϕ(*x*) & ⟩[*p*]ϕ}

Yates makes use of that heuristic in, for instance, his argument that dispositionalism as such entails the (4) axiom:

The powers of actual things determine a branching structure—all the ways the world would have been, had those powers been combined in various ways. Suppose that *<p>* is true, and that nothing throughout the history of the world ever has the power ϕ to bring it about that ~*p*. Could anything have the unmanifested power φ to bring it about that there *is* a power ϕ to bring it about that ~*p*? *No*. If there is such a φ, then there is a branch leading from actuality to a state of affairs in which ~*p*. This, however, is all that it *means* for there to be a power to bring it about that ~*p*. Such transitive cases of bringing about, where a power brings about the truth of a proposition by first bringing about some further configuration of powers, are built into the way we are thinking about how powers bring about the truth of propositions. (2015: 420-21).

In the above, Yates interprets ~∃ϕ⟩[~*p*](ϕ) as “nothing throughout the history of the world ever has the power ϕ to bring it about that ~*p*”. The most straightforward way to obtain this reading is to take the first-order existential quantifier hidden in the definition of the formula to range over all entities at all times. Since both first- and second-order quantifiers are allowed to stand for their plural counterparts, the full formula should be read as “at some point *t* in the history of the world, there is/are being(s) that at some point *t’* (not necessarily the same as *t*) have power(s) ϕ, and ϕ is a power to bring about <*p*>”.[[7]](#footnote-7)

# **3 Dispositionalism and tenselessly actualist quantification**

That actualist quantification should also be eternalist has been assumed by the earliest and best known accounts of actualism (Plantinga 1976, Adams 1981). At the level of quantification over powers, the approach is favoured by Yates 2015 and Borghini and Williams 2008,[[8]](#footnote-8) and seems to be presupposed generally by those who would take synchronic rather than diachronic modalities as their modal focus.[[9]](#footnote-9) But eternalist quantification does not hold a monopoly among dispositionalists. Barbara Vetter’s account, for instance, hints at a diachronic approach to dispositionalist modality with presentist quantification (Vetter 2013), while the monotonicity condition on valuations of formulas over chains in Jacobs 2010’s semantics implies a kind of ‘growing block’ dispositionalism, where the set of powers available grows over time (244).[[10]](#footnote-10)

Now let *w* be the actual world, and *D* the set of objects associated with it. Given dispositionalism, if some possibility is to become actual, it must become actual within *this* spatiotemporal manifold. Thus, for instance, if we assume ♢∃*x*A, this means there is a power ϕ to bring about that ∃*x*A. But given that the manifestation associated with the power occurs at some point in *w*, and given eternalist quantification, the witness supporting ∃*x*A will also present in *D*. Hence, since one does not gain access to new objects by embedding them in a modal operator, one also has ∃*x*♢A. That is, tenslessly actualist dispositionalism validates the Barcan formula.

(BF) ♢∃*x*A → ∃*x*♢A

Similar reasoning suffices to prove the Converse Barcan Formula as well.

(CBF) ∃*x*♢A→ ♢∃*x*A

Assume ∃*x*♢A. Then there is some object *o* of which ♢A[*o*/*x*] holds, where *o* is the value of any free *x* in A. That is, there is a power ϕ to bring about A[*o*/*x*]. But given that the manifestation A[*o/x*] occurs at some point in *w*, and that quantification ranges over all points in *w*, ϕ is also a power to bring about ∃*x*A, i.e. ♢∃*x*A.

In short, whenever we have a possibility, we have some object *for* which that possibility is possible – we don’t gain access to new possible objects by embedding them within a modal operator; and conversely, whenever we have an object for which a property is possible, we have the possibility of an existent object having that property – our quantifiers don’t lose access to the objects we have by moving into scope of a modal operator. Put more simply, tenselessly actualist modal dispositionalism requires a constant domain semantics.

Though it is well-known that certain forms of actualism place restrictions on the first-order domain, it is less frequently noted that different philosophical groundings of modality may force similar conditions may on the second-order level, as well. Regardless of whether a Platonic or Aristotelian form of dispositionalism is adopted, note that if the second-order actualist quantifier, just like its first-order counterpart, ranges over *all* the properties there ever are, then the set of properties, too, just like the set of objects, will be constant. And so, given that powersare properties, it follows *a fortiori*, that the set of *powers* will be constant.[[11]](#footnote-11) From this it trivially follows that there is no power to bring about a power that does not already exist, i.e. ♢♢*ϕ* → ♢*ϕ*. And so *pace* Yates, the (4) axiom is guaranteed not by the notion of a power as such, but the range of tenseleslly actualist second-order quantification.

Furthermore, this assumes quite a bit *more* than is necessary to prove the (4) axiom: it suffices to prove the (5) axiom as well, i.e.

(5) ♢*p* → □♢*p*

which translates to

(P5) ∃Φ⟩[*p*](Φ) → ~∃Ψ⟩[~∃Φ⟩[*p*](Φ)](Ψ)

Proof: assume the contrary. Then there is a power Φ to bring it about that <*p*>, *and* there is a power to bring it about that no power brings about <*p*>. But Φ itself is a power to bring about that <*p*>. And so, *a fortiori*, there is a power to bring it about that Φ does not exist.[[12]](#footnote-12) But the domain of powers is constant. And so, Φ must always be available. And so there is no power to bring it about that Φ isn’t available, i.e. that Φ doesn’t exist. Contradiction.

# **4 The material inadequacy of constant domain dispositionalism**

However, the adoption of eternalist quantification has further consequences for the dispositionalist. To see this, consider again what different theories of modality are taken to be theories *of*. For a Lewisian modal realist, modal claims track brute similarity relations between ourselves and our various trans-world counterparts. For many ersatz modalists, modal claims aim to capture our basic intuitions about what modal truths there are. But for the dispositionalist, modality tracks dispositions or powers, and powers are fundamentally powers *to bring about* a certain state. Otherwise put, the whole reason dispositionalists posit powers in the first place is to explain *coming to be*, along with its corollary *passing away*. Dispositions explain generation and corruption.

Now, adopting language going back to the Latin reception of Aristotle, we can say that change comes in two varieties: substantial and accidental. Substantial change results in the coming into (or passing out of) existence of new *objects*; accidental change, in the coming into (or passing out of) existence of new *properties*. To make the point somewhat more explicit, when becoming or passing away occurs, something moves from not existing to existing, i.e. passes from non-being into being, or vice versa. But if the our first-order quantifiers range over the world as a completed totality, then there is never an instance of an object moving from within the scope of our quantifiers to outside of it, or vice versa: no new objects come into (or out of) being. And if the domain of our second-order quantifiers is also constant, then no new properties ever come into (or out of) existence, either.

This means that a constant domain dispositionalism is unable to account for the very things dispositions exist to account for in the first place. Dispositionalism grounds modality in powers, and powers are powers *to bring things about*. But adopting such an account only makes sense if some of the things that can be brought about *are not*. Assume <*p*> is some state of affairs. If <*p*>holds in the actual world at any point, then there is no need to talk about it coming to be: the objects and properties involved in <*p*> are already captured by the semantics for the non-modal portion of our language, and so the truth of ♢*p* holds trivially on weak dispositionalism, given the disjunctive definition of possibility; and it *fails* on strong dispositionalism for precisely the reasons Yates criticizes strong dispositionalism’s handling of mathematical truths – one cannot bring about what already is.[[13]](#footnote-13) If, on the other hand, <*p*> does *not* hold at any point throughout the history of the actual world, then the only way in which it can be possible is as a possibility that is *never* realized – which is just to say that it can never be brought about. Proof: Assume the contrary. Then there is an extension of the actual world with <*p*> as an existing state of affairs. But if *this* is so, then the state of affairs constituting <*p*> is already in the scope of our non-modal quantifiers and predicates, which we assumed it wasn’t. Contradiction.

# **5 Conclusion**

The paramount concern of an account of possibility couched in terms of powers *to bring about* is to account for generation and corruption, whether of things or of properties, within the order of the universe as it stands; and quantification ranging over all times renders *any* account of this inadequate. *To be brought about* just *means* to be brought into connection with the order of things up to now as an extension of it; eternalist quantification, however, presupposes that the order of things is already completely captured – *closed*, therefore unextendable;and this means that tenseless dispositionalism’s unrealized possibilities are just disguised *im*possibilities.

There are ways out of this problem: for instance, Vetter takes a temporal approach to dispositionalist modality, wherein the availability of powers changes over time (2013: 11-12). But for the reasons given, I doubt any materially adequate account can be provided within a tenselessly actualist dispositionalist framework.

This paper has examined the relationship between dispositionalism, modality, and quantifier scope. I’ve shown that dispositionalism does not as such entail (4), though (4) is straightforwardly entailed by the eternalist actualist commitments that many dispositionalists are, in fact, committed to. The problem, however, is that these *same* commitments undercut the very reason for adopting dispositions in the first place: dispositionalist modalities account for generation and corruption; but the adoption of constant domains for objects and/or properties just *denies* that there is any such thing, and so ends up denying the very thing it was meant to explain. This situation can be remedied by the adoption of a presentist, growing-block, or otherwise restricted approach to quantifier scope. But what is certain is that the dispositionalist about modality has to deny one of the theses that makes actualism of any stripe appealing in the first place: that everything exists.

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1. Recent dispositionalist accounts of modality include Simchen 2006, Borghini and Williams 2008, Jacobs 2010, Vetter 2013, and Yates 2015. [↑](#footnote-ref-1)
2. For instance, *combinatorialism* (Cresswell 1972, Armstrong 1989), on which possibilities are constructed by combining the basic elements of the actual world, fails to countenance possibilities involving objects none of whose parts exist at the actual world (Priest 2008: 30). [↑](#footnote-ref-2)
3. As an instance of the first, Linsky and Zalta posit contingently nonconcrete objects that function much like *possibilia* do on a Lewisian account: where the modal realist posits talking donkeys as *possibilia* – objects that are actual elsewhere – Linsky and Zalta posit talking donkeys as *nonconcreta* – abstract objects that are actual *here*,but that could be flesh and blood talking donkeys (Linsky and Zalta 1994, 1996). As an instance of the second, Michael White offers the actualist one reading of the existential quantifier outside of, and another, non-existentially committing reading within the scope of a modal operator (White 1985; Cf. McMichael 1983: 53-55). The motivation for such a reading is the idea that possible worlds should be identified with maximal states of affairs (Plantinga 1974) or maximally consistent sets of propositions (Adams 1981); and that quantified propositions embedded under a modal operator may be true without having any true instances, since the individuals involved in embedded in modal claims don’t exist. [↑](#footnote-ref-3)
4. That such forms of actualism are somehow less fully actualist is suggested by the common practice of contrasting this sort of ‘softcore’ actualism with more ‘hardcore’ varieties (Cameron 2008, Contessa 2010). [↑](#footnote-ref-4)
5. “Consider <2+2 = 4>. The world contains things with the power to bend, break, attract and repel, but nothing with the power to bring about that ¬(2+2= 4) […] As required, then, we have ¬∃ϕ⟩[¬(2+2=4)](ϕ) […]. Unfortunately, it is also true that there is nothing with the power to bring it about that 2+2=4. This is not the sort of thing powers are powers to do.” (Yates 2015: 415). [↑](#footnote-ref-5)
6. Cf. Jacobs 2010, Borghini and Williams 2008, and Vetter 2013 and forthcoming, among others. [↑](#footnote-ref-6)
7. I say ‘point’ rather than the more simple ‘time’ to leave open whether the points are taken to be temporal instants, space-time points, or perhaps something else altogether. [↑](#footnote-ref-7)
8. “If the world contains some disposition such that its manifestation is the state of affairs S, then S is possible” (Borghini and Williams 2008: 26). [↑](#footnote-ref-8)
9. Briefly, ♢*p* holds *synchronically* at a time *t* in a history *h*, iff there is some alternative history *h’* on which *p* holds at *t*; while ♢*p* holds *diachronically* at time *t* in a history *h* iff there is some *t’* in *h* such that *t*<*t’*, and *p* holds at *t’*. [↑](#footnote-ref-9)
10. In truth, Jacobs’ account is ambiguous on this point: on the one hand, the formal semantics he gives suggests a diachronic account of modality, where powers at a stage *n* entail the presence of a given state of affairs not at *n*, but at stage *n+1*. On the other hand, the examples he uses in his informal presentation are frequently synchronic, e.g. the actualization conditions corresponding to the statement “I could have been a truck driver” are not conditions located in the immediate future, but rather are uninstantiated conditions for my *present* self. [↑](#footnote-ref-10)
11. Couldn’t onehold the set of powers variable by assuming that non-powerful properties may *become* powers? Not on an eternalist account. Let *F* be a power to bring about *p*. If *F,* in addition, is *not* a power to bring about *p*, then one is either tacitly assuming that *F* both (tenselessly) is and (tenselessly) is not a power to bring about that *p*, and hence assuming a contradiction; or one is assuming a less fine-grained individuation of powers than is really available to the eternalist. The eternalist cannot, for instance, appeal to the idea that *F* is a power at *a* to bring about *p* at *b*, but *F* is not such a power at *c*: for the eternalist, all of this information is already built into *F*, and being a power at *some* point is both necessary and sufficient for being within the scope of the second-order eternalist quantifier over powers, hence within the set of powers *simpliciter*. [↑](#footnote-ref-11)
12. Objection: can it not be the case that rather than bringing about Φ’s non-existence, the power in question merely makes Φ (as well as every other power) such that it is no longer a power to bring about that <*p*>? No: to do so would *just be* to bring about Φ’s non-existence. Proof: powers are individuated by what they are powers *for*, i.e. by what it is they bring about. Therefore, powers that bring about different states of affairs are different powers. To change what a power brings about, then, is not a change in the power, but rather the replacement of one power with another. [↑](#footnote-ref-12)
13. “The putative universally instantiated power to be an *x* such that 2+2 = 4, by contrast, has no connection with the truthmaker for <2+2-4>, whatever that might be. It has neither reciprocal partner powers, nor any other condition on its manifestation, for it is never unmanifested” (Yates 2015: 416). [↑](#footnote-ref-13)