Intrinsic Properties of Properties

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Do properties have intrinsic properties of their own? If so, which second-order properties are intrinsic? This paper introduces two competing views about second-order intrinsicality: *generalism*, according to which the intrinsic-extrinsic distinction cuts across all orders of properties and applies to the properties of properties as well as the properties of objects, and *objectualism*, according to which intrinsicality is a feature exclusive to the properties of objects. The case for generalism is then surveyed along with some proposals for distinguishing intrinsic second-order properties from extrinsic ones. After addressing these broad questions about the nature of second-order intrinsicality, the Problem of Accidental Intrinsic Properties of Properties is introduced and put to work as a case study for the significance of second-order intrinsicality. The connection between this problem and the metaphysics of quantitative properties is then examined.

§1. Introduction

The distinction between intrinsic and extrinsic properties is a familiar piece of metaphysical machinery, marking an intuitive and theoretically fruitful division among properties.[1] Without this distinction, we cannot distinguish notions like duplication from qualitative indiscernibility nor can we formulate or assess metaphysical theses about objects, causation, and change, which regularly appeal to intrinsicality.[2] But, for all its value and familiarity, the place of intrinsicality within broader metaphysical structure remains unclear in some key respects. Perhaps most notably, it is unclear whether the intrinsic-extrinsic distinction extends to the properties of properties. This essay aims to examine the issue of "second-order intrinsicality" beginning with the following question: do properties have intrinsic properties of their own?

At the outset, it will be useful to introduce three potential views about second-order intrinsicality, each of which assumes realism about first-order properties. (Here,

[1] On the nature and applications of intrinsicality, see Bader (2013), Eddon (2010), Figdor (2014), Francescotti (1999), Langton and Lewis (1998), Marshall (2014, forthcoming-a, forthcoming-b), Sider (1996), Skiles (2014), Witmer, Butchard, and Trogdon (2005), and Yablo (1998).

[2] Duplicate entities share all (qualitative) intrinsic properties, while qualitatively indiscernible entities share all intrinsic and extrinsic properties. On whether there are indiscernible universals, see Rodriguez-Pereyra (forthcoming).

'property' is intended in a broad sense to include relations and other *n*-adic properties.) According to the first view, there are no intrinsic properties of properties because there simply are no second-order properties. Defenders of this view avoid commitment to second-order intrinsics by opting for what Bergmann (1957) calls "elementarism," according to which all properties are first-order.[3]

According to the second view, *objectualism*, there are second-order properties, but the intrinsic-extrinsic distinction does not apply to higher-order properties. So, while first-order properties are either intrinsic or extrinsic, second- and *n*-order properties are neither intrinsic nor extrinsic. For objectualists, intrinsicality is a category-specific notion and it applies exclusively to the properties of objects.[4]

According to the third view, *generalism*, intrinsicality is order-neutral and category-neutral, applying to the properties of entities regardless of their ontological category. So, in contrast to objectualism, generalism takes the intrinsic-extrinsic distinction to divide up the entire domain of properties including second- and higher-order properties. (Throughout what follows, I focus on second-order rather than *n*-order properties but, unless otherwise noted, most claims regarding "second-order properties" are intended to hold for higher-order properties as well.)

While generalism requires that the intrinsic-extrinsic distinction apply to second-order properties, it leaves open which second-order properties are intrinsic. Different versions of generalism might therefore deliver importantly different views about which kinds of second-order properties are intrinsic. The two most radical forms of generalism would, for example, count all second-order properties as extrinsic or, much to the contrary, count all second-order properties as intrinsic.[5] Intuitively, there is little to be

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[3] See Armstrong (1978: 133).

[4] Views that fall between objectualism and generalism hold that the intrinsic-extrinsic distinction extends to the properties of objects and to only some ontological categories like, say, events or states of affairs. In what follows an ontology of only objects and properties is assumed.

[5] Restricted versions of generalism might hold that, while some second-order properties are intrinsic and others extrinsic, the intrinsic-extrinsic distinction is not exhaustive and therefore does not apply to absolutely all second-order properties. For example, Bader (2013) suggests that, granted some auxiliary assumptions, impossible properties are neither intrinsic nor extrinsic.

said for such extreme views, since *being Obama's favourite property* seems plainly extrinsic and *being mereologically complex* seems plainly intrinsic. But, despite the potential for serious disagreement here, generalists share a common commitment to the thesis that the intrinsic-extrinsic distinction applies to second-order properties.

Throughout the following, an ontology of second-order properties is assumed and so the elementarist option noted above is set aside. But, even granted this assumption, there remains a thorny disagreement between objectualists and generalists. Worse still, it's far from clear how we ought to attempt to settle the potential debate between objectualists and generalists. Here, my project is to make some initial progress in assessing this disagreement and to map out some of its consequences. To this end, l begin by outlining some motivations for preferring generalism over objectualism. In Sections Three and Four, the aim of the paper narrows in order to focus on a particular issue raised by second-order intrinsicality: the Problem of Accidental Intrinsic Properties of Properties. As I'll argue, views about the nature of second-order intrinsicality are crucial for assessing the scope and force of this problem. Finally, attention to this problem is shown to provide us with a novel insight into modal issues concerning the metaphysics of quantitative properties.

In proceeding, additional simplifying assumptions will be useful. First, I set aside discussion of class nominalist views according to which sets alone play the theoretical roles typically associated with properties.[6] While it is plausible that sets have intrinsic properties, sets are most plausibly taken to be objects, so class nominalist views are importantly different from the trope and universal-based views of present interest. Second, while I assume realism about second-order properties and first-order properties "abundantly conceived," the following discussion focuses primarily on the properties of

[6] On class nominalism, see Armstrong (1978), Sider (1996), and Lewis (1983). On the prospects for other nominalist options, see Rodriguez-Pereyra (2002). On some puzzles about accidental properties of properties with the class nominalist framework, see Egan (2004). I also set aside what I take to be the best available theory of properties, locationism. For discussion, see Cowling (2014).

sparse first-order properties and their respective second-order properties.[7] In this way, complications stemming from the contentious status of abundant properties can be set aside. The following discussion also remains largely neutral between trope and universal theories until noted in Section Five.

§2. Why Worry about Second-Order Intrinsicality?

Objectualism about intrinsicality denies second-order properties divide into the intrinsic and the extrinsic. In contrast, generalism holds that second-order properties are properly classified as either intrinsic or extrinsic. This section surveys some reasons to prefer generalism over objectualism. A natural strategy on this front appeals to metaphysical intuitions about intrinsicality—e.g., by taking this or that second-order property to *just seem* intrinsic. Some appeals of this sort do seem plausible. For example, it does *just seem* that *being a property* is intrinsic to any given property and that *being identical to mass* is also intrinsic to *being mass*. In contrast, *being Obama's favourite property* seems intuitively extrinsic. Even so, generalists are better served by appealing to broader theoretical considerations in their efforts to defend second-order intrinsicality. We will therefore set aside the intuitive case for generalism and argue that second-order intrinsicality should be taken seriously out of a kind of theoretical necessity.

Theoretical necessity arguments for generalism proceed by showing that a certain metaphysical theory presupposes the distinction between intrinsic and extrinsic properties of properties. In some cases, a theory's commitment to generalism is fairly explicit. In other cases, the relevant commitment is an implicit one that needs to be carefully extracted from the theory's other commitments. Perhaps the best example of the former kind comes from certain versions of trope theory.

[7] Those who identify "abundant" properties with sets can take what follows to concern only sparse properties, which are identical with some universal or trope. On the sparse-abundant distinction, see Lewis (1983). On fundamental second-order properties, see Eddon (2013).

On standard versions of trope theory, a property, *F*-ness, is a class of *F*-ness tropes.[8] These *F*-ness tropes are distinguished from, say, *G*-ness tropes, not by their extrinsic properties—e.g., by where they are located in the world—but, instead, by their intrinsic properties. Indeed, the standard trope theorist typically takes tropes of the very same property to be intrinsic duplicates of one another.[9] On the resulting view, the properties of tropes divide into the intrinsic and the extrinsic, and it is the intrinsic properties of tropes that determine whether they are *F*-ness rather *G*-ness tropes. (For example, some *F*-ness tropes will be in different locations and therefore differ extrinsically, but this has no bearing on whether they are *F*-ness rather than *G*-ness tropes.) So, where defenders of universals appeal to the numerical identity of universals across their instances, the trope theorist appeals to the sameness of the intrinsic properties of tropes. Without this distinction between the intrinsic and extrinsic properties of tropes, the unity of certain tropes as a single property, *F*-ness, is inexplicable. For this reason, generalism is an explicit commitment of standard versions of trope theory. And, even for those versions of trope theory that might invoke extrinsic properties of tropes in distinguishing *F*-ness tropes from *G*-ness tropes (e.g., by taking extrinsic features of tropes like temporal order or spatial position to individuate *F*-ness tropes), the distinction between the intrinsic and extrinsic properties of tropes proves useful precisely because it allows us to capture why this alternative proposal delivers an interestingly different account of what distinguishes and unifies tropes with one another.[10]

The fact that many trope theorists are antecedently committed to generalism will do little to sway proponents of universals towards generalism. But, as we'll now see,

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[8] On trope theory, see Armstrong (1978), Campbell (1990), and Ehring (2011). (Note that Ehring's Natural Class Trope Nominalism differs importantly from standard versions of trope theory.)
[9] On trope theory's "primitive of similarity—exact duplication of tropes," see Lewis (1983: 22).
[10] The view that extrinsic properties of tropes individuate tropes is perfectly compatible with generalism. The more radical option of dispensing with the first-order intrinsic/extrinsic distinction remains open to trope and universal theorists but squares poorly with generalism. Here, it is assumed that trope and universal theorists are committed to the intrinsic-extrinsic distinction at least in the first-order case. Those who reject even the first-order distinction are unlikely to admit a second-order distinction. Thanks here to an anonymous referee.

second-order intrinsicality also proves to be a crucial resource for developing a metaphysics of universals and for making sense of the instantiation relation.

According to proponents of universals, the natures of objects are to be explained by virtue of objects bearing the instantiation relation to universals. Some account is therefore owed of why a given universal *F* rather than a different universal *G* plays the specific metaphysical role it does in the world—i.e., why it makes its particular contribution to the natures of objects or to the nomic structure of the world.[11] And, in explaining why differing universals play different metaphysical roles, universal theorists can appeal either to the features of universals themselves or, instead, to the ways in which universals are related to other entities (e.g., by pointing to their patterns of instantiation). On the former view, a universal like *mass* is claimed to occupy its particular metaphysical role in the world because of the very nature of *mass* itself. On the latter view, *mass* occupies its metaphysical role because it happens to be the property instantiated by, say, certain individuals in a certain pattern.

Setting aside the prospects of the latter strategy, those who opt for the former and more familiar approach are naturally committed to second-order intrinsics.[12] For, on this second strategy, the proponent of universals explains why different universals play their respective metaphysical roles by positing that universals have distinctive intrinsic natures, where these intrinsic natures are just the intrinsic properties of universals themselves. Granted this commitment to intrinsic natures and second-order intrinsics, the above explanation of the distinctive contribution of *mass* is available. In contrast, views of universals that would attempt to do without intrinsic properties face a

[11] On platonist options regarding the intrinsic features of "ersatz" entities, see Nolan (forthcoming).

[12] There is reason to think the latter strategy's prospects are limited. First, it seems possible that radically different (Platonic) universals might have the same extrinsic properties—e.g., two different uninstantiated universals would differ only in their intrinsic natures and not in their extrinsic properties. Second, the view that universals' relations to *objects* explain the features of universals runs contrary to the standard ambition of universal theories, which seek to explain the natures of objects in terms of universals.

considerable hurdle in explaining how universals can occupy their distinctive metaphysical roles or contribute different features to the natures of objects.[13]

Along with explaining the distinctive roles of various universals, generalism plays a key role in accounting for the nature of the instantiation relation between universals and objects. Depending upon whether one opts for Aristotelianism and *in re* universals or Platonism and *ante rem* universals, matters will differ considerably.[14] For Aristotelians, direct appeal to constituency relations between universals and objects is commonplace in explaining "instantiation." Roughly speaking, universals are constituents, whether mereological or non-mereological, of the objects that instantiate them. For Platonists, the metaphysical tie between universals and objects isn't a matter of constituency. Instead, a fundamental relation of instantiation unites non-spatiotemporal universals with objects.

In spelling out the nature of the instantiation relation, a central concern for all parties is whether it is internal or external in nature. Internal relations like *is a duplicate of* or *has as many parts as* supervene upon the intrinsic natures of their *relata.* In contrast, external relations like *is five feet from*, do not supervene upon the intrinsic natures of their *relata* but do supervene upon the intrinsic nature of the mereological sum of their *relata* or, as Lewis (1986) puts it, their *relata* "taken together."[15] If instantiation proves to be an internal relation, the intrinsic nature of an object and that of a universal necessitate facts about which universals are had by which objects. Alternatively, if instantiation is deemed external, the intrinsic natures of the *relata* taken separately do not suffice to fix whether they bear the instantiation relation; something beyond the relevant intrinsic

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[13] The intrinsic properties of properties need not themselves be universals as the defender of universals might follow Lewis (1986) in distinguishing between the metaphysical status of sparse universals and abundant properties viewed set-theoretically.

[14] On the divide, see Armstrong (1978) and van Inwagen (2004).

[15] On the internal-external distinction, see Lewis (1986: 62-63, 176-177). Proponents of the Lewisian conception include Armstrong (1989a: 43) and Bennett (2011: 32). On some historical conceptions of "internal relations," see Dunn (1990). For those skeptical of whether supervenience might suffice to capture the internal/external distinction, a closely related proposal replaces talk of supervenience upon intrinsic natures with talk of relations being grounded in or holding in virtue of intrinsic natures.

natures must be involved.[16] And, while other options remain open in this regard, no comprehensive characterization of instantiation can be given without taking sides on the status of instantiation as internal or external.

Importantly, however, this distinction between internal and external relations presupposes an antecedent distinction between intrinsic and extrinsic properties of *relata* and so between the intrinsic and extrinsic properties of universals. This is because, as standardly characterized, internal relations are those relations that never differ between pairs (or *n*-tuples) of *duplicate* entities. In contrast, external relations are those that differ between pairs (or *n*-tuples) of *duplicate* entities but nevertheless supervene upon the intrinsic properties of the fusions of the pairs (or *n*-tuples). Consequently, if universals are the kinds of things that can stand in internal or external relations, the mere application of the distinction between internal and external relations requires that universals can be (or fail to be) duplicates of another. In turn, this requires that universals themselves have properties to which the intrinsic-extrinsic distinction applies.[17] So, regardless of whether instantiation is internal or external, a full-fledged theory of instantiation requires the intelligibility of talk about intrinsic or extrinsic properties of universals.[18] A full account of instantiation is therefore available only after the defender of universals accepts generalism.

If proponents of universals hope to provide an explanation of the differences between universals and of the instantiation relation that unites universals with objects, the assumption that universal's properties can be divided into the intrinsic and the

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[16] On the Aristotelian metaphysics of universals with bare particulars, see Wildman (2015).

[17] An alternative would be to hold the internal-external distinction to be independent of the intrinsic-extrinsic distinction. Such a view might have particular appeal if one opts for certain structuralist views on which "intrinsic natures" are dispensed with altogether. Here, the Lewisian conception of the distinction is assumed. Thanks here to an anonymous referee.

[18] A third option—that instantiation is a purely extrinsic relation and therefore independent of the intrinsic natures of entities to be a non-starter. A fourth approach dispenses with an ontological commitment to the instantiation relation, taking it as a bit of primitive ideology. The merits of this fourth approach are controversial, but can be set aside here, noting that the present concern can be raised regarding any relation that would have a property as one of its *relata*.

extrinsic proves enormously useful. So, like trope theorists, those who accept universals have ample reason to take second-order intrinsicality seriously.

Now, supposing that we opt for generalism, we face the challenge of drawing the line between intrinsic and extrinsic second-order properties. On this front, it is perhaps unsurprising that second-order intrinsicality generates serious challenges for certain extant analyses of intrinsicality. Consider, for example, a familiar proposal on which intrinsicality is to be analyzed in terms of duplication by holding intrinsic properties to be precisely those properties that do not differ between duplicate objects.[19] If we attempt to generalize this proposal to the second-order case, the resulting analysis holds second-order intrinsic properties to be those properties that do not differ between duplicate properties.[20] And, while duplicate invariance is plausibly taken as a mark of first-order intrinsicality, the same cannot be said in the second-order case. It is, after all, highly controversial whether there could be any duplicate properties. For, as just noted, familiar versions of Aristotelianism and Platonism ascribe each universal a distinctive intrinsic nature.[21] Granting these fairly standard views, the generalization of the duplication-based account delivers the implausible verdict that *all* second-order properties are trivially intrinsic, given the absence of duplicate universals.[22]

Second-order intrinsicality is no less of a problem for views that make crucial appeal to modal resources in analyzing intrinsicality. Following Langton and Lewis

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[19] See Lewis (1983: 111).

[20] Note that this diagnostic is most naturally applied only to qualitative properties, since non-qualitative properties like *being Obama* vary across duplicates even while such properties are plausibly counted as intrinsic. In contrast, other non-qualitative properties like *being five feet from Obama* are plainly extrinsic.

[21] In contrast, according to trope theories like those considered above, second-order duplication is perfectly legitimate, since it is taken as a primitive relation that accounts for the individuation of tropes. On such a view, tropes are sorted into different classes of duplicates by virtue of the primitive relation of *trope duplication* and tropes of a common kind all bear the *trope duplication* relation to one another.

[22] One might hold, instead, that universals are "featureless" entities with no intrinsic natures and are therefore duplicates of every other universal. But, in this case, objectionable results also follow. For instance, apparently intrinsic second-order properties like *being identical to mass*, *having no parts*, *being uninstantiable*, and others would count as extrinsic, given that they differ between properties. On whether universals might be duplicates or indiscernibles, see Lewis (1986: 84) and Rodriguez-Pereyra (forthcoming).

(1998), we might take intrinsicality to consist in "independence from accompaniment," where a property *F* is independent from accompaniment if and only if (i) possibly, there exists a lonely *F* (i.e., no objects but the bearer of *F-ness* exist), (ii) possibly, there exists a lonely non-*F*, (iii) possibly, there exists a non-lonely *F*, and (iv) possibly, there exists an accompanied non-*F*.[23] Given the necessary existence of properties assumed by *ante rem* Platonists or the essential connections between properties like *redness* and *being coloured* that almost all property theories require, this reliance on modal notions to analyze intrinsicality leads to serious problems. For, while first-order analyses of intrinsicality that appeal to accompaniment independence presuppose fairly uncontroversial modal theses about which objects could exist without other objects (e.g., that a duplicate of *this* patch of spacetime could exist entirely alone), there are myriad necessary connections among properties and so markedly less modal independence among such entities. As a result, it is far from obvious how to interpret the modal-existential clauses used to define accompaniment independence and unlikely that any natural interpretation will deliver plausible verdicts about intrinsicality, especially since necessary connections among properties preclude properties existing without themselves instantiating other properties like *being a property* or *being instantiable*.[24]

Analyses of intrinsicality that appeal to duplication or accompaniment independence face many other challenges but, for the reasons just noted, they are in even worse shape given generalism. So, for generalists interested in analyzing intrinsicality, whether at the first- or second-order, a natural place to look is to those

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[23] On the challenges that beset these views, see Langton and Lewis (1998), and Marshall (2009, forthcoming-a, forthcoming-b), and Bader (2013).

[24] Proponents of accompaniment independence might restrict their analysis to fundamental or "sparse" universals, claiming that no second-order properties are sparse. The resulting view would possibly lonely properties to be those sparse properties that can exist without the instantiation of any other sparse properties, so the necessary coexistence of second-order properties is no obstacle to certain second-order properties counting as intrinsic. Along with the contentious modal assumptions such a view would require to get off the ground, there is no reason to rule out the possibility of properties that are sparse or fundamental despite being second-order properties. This strategy therefore imposes unwarranted constraints on theories about sparse properties. On the case for the fundamentality of certain second-order properties, see Eddon (2013).

views that invoke hyperintensional resources like a primitive relation of grounding or "metaphysical dependence." Along these lines, intrinsic properties can be singled out as those properties had in virtue of their bearer alone, where this hyperintensional *in virtue of* relation is left unanalyzed.[25] Generally speaking, such accounts deliver credible verdicts when applied to the second-order case. It is plausible, for instance, that *mass* has intuitively intrinsic properties like *being identical to mass* and *being qualitative* in virtue of itself alone.[26] And, while other cases may prove less clear cut or hinge upon competing accounts of metaphysical dependence, the hyperintensional character of such proposals affords the generalist one especially key tool: a means for distinguishing intrinsic and extrinsic properties from among the stock of properties that properties have necessarily. This is because the hyperintensional relation of metaphysical dependence allows the generalist to account for why a property necessarily borne by mass like *being identical to mass* is intrinsic, while other properties *mass* has of necessity—e.g., *being possibly instantiated by a dog* or *not being instantiated by numbers*—are extrinsic. For this reason, hyperintensional views are the most promising option for analyzing second-order intrinsicality and for addressing familiar problems that arise in accounting for first-order intrinsicality. If, however, even hyperintensional views prove inadequate, one remaining option for generalists is to accept a primitivist view of intrinsicality.

For the primitivist, the generality of intrinsicality—i.e., its application to higher-order properties—motivates taking intrinsicality to be an irreducible feature of the world's metaphysical structure. On the resulting primitivist view, the division of the intrinsic and extrinsic is unanalyzable and cuts across the properties of whatever kinds

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[25] Proposals along these lines that appeal to accompaniment independence as well as grounding (e.g., Witmer, Butchard, and Trogdon (2005)) will inherit the challenges previously noted. Other proposals—e.g., Rosen (2010), Bader (2013), Witmer (2014), and Marshall (forthcoming-b)—eschew accompaniment independence but still appeal to hyperintensional dependence relations.

[26] Rosen (2010) suggests the following analysis: "*F* is an intrinsic property iff, as a matter of necessity, for all *x*: If *x* is *F* in virtue of $\phi(y)$—where $\phi(y)$ is a fact containing y as a constituent—then *y* is part of *x*; and if *x* is not-*F* in virtue of $\phi(y)$, then *y* is part of *x*." According to Bader (forthcoming), a property F is intrinsic "iff F is always had solely in virtue of how a thing itself is or F is a fundamental property." Cf. Witmer (2015), and Marshall (forthcoming-b).

of entities make up the world.[27] In what follows, I leave open whether generalists ought to opt for one of several competing hyperintensional proposals or, failing that, embrace primitivism. Regardless, we can help ourselves to the assumption that certain properties are, in fact, second-order intrinsics, since there is a somewhat narrow class of second-order properties that have strong claim to being intrinsic. In some cases, this is because their first-order analogues are plausibly counted as intrinsic and, setting aside worries about circularity, they have features apparently characteristic of second-order intrinsicality—that is, they seem to be features of properties that depend upon nothing but their bearers and are intuitively viewed as part of the "nature" of their bearers. So, while we need not take sides regarding the proper analysis of intrinsicality, our grasp on second-order intrinsicality does license us to distinguish at least this small list of candidate second-order intrinsics.

The best of these candidates are as follows: categoreal properties like *being a property* or *being a universal*, adicity properties like *being monadic* or *being dyadic*, property-theoretic properties like *being intrinsic, being non-qualitative, being categorical, being dispositional,* or *being perfectly natural*, structural properties like *being mereologically simple, being mereologically complex,* or *having F-ness as a part*, and quiddistic properties—the property-analogues of haecceities—like *being identical to mass*, which depend upon nothing other than *mass* itself.

The case for other candidates is more tentative and hinges upon difficult questions about the relevant metaphysics of first-order properties.[28] Even so, the following properties have a plausible albeit contentious claim to second-order intrinsicality: modal properties of properties like *being instantiable* or *being uninstantiable,*

[27] On primitivism about intrinsicality, see Eddon (2011) and Skiles (2014).

[28] Nomic properties are a controversial class of candidate second-order intrinsics. For Humeans about laws, there are no (interesting) intrinsic nomic properties, since extrinsic properties are bound up with facts about regularities that fix the nomic roles of properties. On competing non-Humean views, nomic properties like *being the property in virtue of which acceleration is resisted* will be intrinsic second-order properties.

physical properties like *being physical,* and determinate-determinable properties like *being a colour property*.[29]

This limited range of paradigm instances suggests our theoretical grip on the second-order intrinsic-extrinsic distinction is fairly firm in some cases, but becomes somewhat tenuous when we turn our attention to less familiar second-order properties. Fortunately, the assumption that our paradigm cases are genuinely intrinsic is all that is required for us to map out certain metaphysical implications of second-order intrinsicality in what follows.

§3. Accidental Intrinsics

We've set out some motivations for taking second-order intrinsicality seriously and considered some views about the distinction between second-order intrinsics and second-order extrinsics. In the next few sections, I offer an extended case study in the significance of second-order intrinsicality by turning to the Problem of Accidental Intrinsic Properties of Properties or, for present purposes, "the Second-Order Problem."

Lewis (1986: 202-204) presents the Problem of Accidental Intrinsics—here, we'll call it "the First-Order Problem"—roughly as follows.[30] Suppose that Edie is actually F but could have been G. Put in terms of possible worlds, Edie instantiates the intrinsic property *F* at the actual world, @, and the intrinsic property *G* at another possible world, *w*. Further suppose that Edie is numerically identical across @ and *w*. Put a bit differently, suppose that Edie is a bilocated object, wholly occupying @ while instantiating *F* and wholly occupying *w* while instantiating *G*. Finally, suppose that *F* and *G* are contrary or contradictory properties and not coinstantiable by the very same individual. Granted these suppositions, Edie would seem, *per impossible,* to instantiate contrary or contradictory properties.

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[29] On quiddities, see Locke (2012). On modal properties and their more general intrinsic status, see Bader (2013). On shape properties as another potential example, see footnote 40 below.

[30] On the problem of accidental intrinsics, see Lewis (1986: 202-204), Haslanger (1989), Wasserman (2003), and Eddon (2010).

For Lewis, the proper resolution to this problem is to deny that individuals are numerically identical across possible worlds. Instead, possible individuals are worldbound, having parts at only a single world. And, since individuals do not have *de re* modal properties by virtue of being bilocated across worlds, Lewis opts for counterpart theory, according to which individuals like Pat have their *de re* modal properties in virtue of having counterparts in other worlds. For Lewis, counterpart relations among possible individuals are relations of qualitative resemblance. So, according to Lewisian counterpart theory, the claim that Edie is possibly *F* is true because Edie appropriately resembles some possible individual that is *F* (and the same goes for most any other *de re* possibilities).[31]

The First-Order Problem has both temporal and spatial analogues.[32] In these parallel cases, the numerical identity of individuals across times or regions generates problems once it is granted that individuals might instantiate contrary or contradictory properties at distinct times or regions.[33] In responding to the temporal analogue of the First-Order Problem (otherwise known as the Problem of Temporary Intrinsics), Lewis opts for a perdurantist metaphysics of persistence, according to which an individual has distinct temporal parts at the various times at which it exists, which stands in stark contrast to endurantism, according to which individuals are numerically identical across times.[34]

A natural strategy for defending endurantism (or its modal analogue) while addressing the First-Order Problem (and its analogues) rejects the initial supposition that the properties causing trouble are intrinsic. Instead, this "relational strategy" holds that these properties are properly recast as relations that an individual bears to different worlds or times. And, since there is no problem with individuals bearing incompatible

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[31] On counterpart theory, see Lewis (1986).

[32] A third spatial variant of this problem concerns extended simples—i.e., bilocated objects lacking any spatial proper parts despite their spatial extension. Most of what can be said about the modal and temporal cases applies to the spatial case, though I focus on the modal case here.

[33] For Lewis on temporary intrinsics, see Lewis (1986) and Eddon (2010).

[34] Lewis' perdurantist view is, in certain respects, disanalogous with his modal counterpart theory. On the temporal analogue of counterpart theory, see Sider (2001).

relations to distinct entities, the putative problem is tidily resolved. Importantly, however, this resolution requires all of an individual's accidental features to be relations to worlds or times rather than intrinsic properties. But, as Lewis argues, this response implausibly strips individuals of what are intuitively intrinsic properties, requiring that objects have all of their intrinsic properties essentially (or permanently, in the temporal case). For Lewis, this is reason to retain the intrinsicality of the relevant properties and, instead, reject the bilocation of objects across possible worlds (or times).

As we've just seen, intrinsicality proves crucial in evaluating competing views about the ontology of objects and their location across worlds or times. At the same time, the force of the First-Order Problem and its analogues is controversial. For some, the threat of a deeply relational metaphysics in which only essential properties are intrinsic is no threat at all.[35] But, for those who take Lewis' case for worldbound entities seriously, a successful extension of this kind of argument to the case of properties will have notable consequences. For this reason, we can now turn to the difficult question of whether there is a genuine Second-Order Problem—i.e., a property-theoretic analogue of the Problem of Accidental Intrinsics.

To begin, it is useful to consider Lewis' remarks on the comparative plausibility of haecceitism—roughly, the thesis that possible worlds might differ only in terms of which individuals occupy which qualitative roles—and quidditism—roughly, the thesis that possible worlds might differ only in terms of which properties occupy which causal-nomic roles.[36] On this topic, Lewis (2009: 209-210) says:

> I accept quidditism. I reject haecceitism. Why the difference? It is not, I take it, a difference in *prima facie* plausibility. In both cases alike, haecceitistic or quidditistic distinctions between possibilities seem offhand to make sense... However, haecceitism leads to trouble in a way that quidditism does not...

[35] As Sider (2006: 392) puts it: "What's so bad about a little relationality in one's underlying metaphysics?" On assessing these arguments, see Eddon (2010).

[36] On haecceitism and quidditism, see Lewis (1986: 220-247), Locke (2011), Hawthorne (2002), Skow (2008), and Schaffer (2005).

> Unmysterious haecceitism demands trans-world bilocation of individuals; unmysterious quidditism demands trans-world bilocation of properties. But bilocation of individuals, whether between worlds or times or places, is trouble. For bilocated individuals are apt to have different intrinsic properties at their different locations… Bilocated properties raise no similar problem: I can think of no plausible example of an intrinsic (higher-order) property which a bilocated property has at one but not another of its locations.

For Lewis, haecceitism is less plausible than quidditism because haecceitism faces the First-Order Problem in accounting for numerical identity of objects across possible worlds.[37] In contrast, Lewis claims to know of no plausible examples of accidental intrinsic properties of properties, so no parallel problem arises for properties. There is, then, no barrier to properties existing across possible worlds, given that their intrinsic properties never vary. As a result, Lewis claims that there is no Second-Order Problem and so quidditism does not face the metaphysical obstacles that make trouble for haecceitism.

Assessing Lewis' claim here would be easy enough if we had reason to reject second-order intrinsics altogether—e.g., by endorsing elementarism or objectualism. But, since there is reason to believe there are at least some second-order intrinsics, the

[37] Talk of "haecceitism" and "quidditism" requires clarification given Lewis' distinctive treatment of haecceitistic possibilities. As Lewis uses "haecceitism" here it is something like the view that qualitatively indiscernible possible worlds differ with respect to what they represent *de re*. (On Lewis' understanding, this likely requires numerical identity of individuals across worlds. See Lewis (1986: 228-248).) At the same time, there are possibilities—e.g., ones according to which individuals "swap" their respective qualitative roles—that are distinctively haecceitistic that Lewis accepts. So, in the latter but not the former sense, Lewis is a haecceitist. (On the various conceptions of "haecceitism," see Graff Fara (2009).) On Lewis' preferred treatment, possible worlds represent a plurality of maximal possibilities that differ haecceitistically from one another. So, for example, the actual world represents both the actualized maximal possibility as well as the possibility according to which, say, you and Obama swap qualitative roles. In contrast to his views on haecceitism, Lewis accepts both analogous quidditistic theses, since Lewis allows for strict identity of properties across worlds (whatever that comes to) and also accepts distinctively quidditistic possibilities—e.g., that *mass* and *charge* could "swap" causal-nomological roles.

proper evaluation of Lewis' claim requires us to answer a more difficult question: are there any *accidental* second-order intrinsics?[38]

If Lewis is correct and there are no accidental intrinsic properties of properties, there is no impediment to properties existing across worlds or times. If, however, Lewis is mistaken, the First-Order Problem generalizes to properties and generates the Second-Order Problem, since some properties have accidental intrinsic properties. And, if there is a Second-Order Problem, the consequences for the metaphysics of properties are widespread. It would, for example, rule out the bilocation of universals across possible worlds. And, since the bilocation of universals is central to the universalist explanation of property-theoretic phenomena, the results are serious indeed.[39] (Things are graver still when we generalize this problem to the temporal and spatial cases.) Given its potential consequences, we can now turn to the challenge of settling whether or not the Second-Order Problem is a genuine one.

§4. Accidental Second-Order Intrinsics

Up to this point, our discussion has remained largely neutral between competing views of properties. From here on, a framework of Aristotelian universalism is assumed. In large part, this is because questions about the bilocation of properties across worlds are considerably more straightforward on such a view. At the same time, we can leave open whether what follows naturally extends to the case of Platonic universals or tropes.

Of those candidate second-order intrinsics singled out in Section Two, very few are plausibly held to be accidental properties of properties. In this section, we can focus on those properties most likely to be counted as *accidental second-order intrinsics* to see whether they generate a Second-Order Problem. On this front, the leading suspects are adicity properties like *being monadic* and *being triadic*, where such properties determine

[38] Strictly speaking, Lewis' claim that fundamental properties have no accidental intrinsic properties is compatible with three different views about second-order intrinsicality: (i) Lewis' preferred view, which holds that all intrinsic properties are essential to their bearers, (ii) objectualism, and (iii) the view that all second-order properties are extrinsic.

[39] See Armstrong (1978: 94).

the number or kind of entities that a property could be instantiated by.[40] We will examine these properties throughout this section and then, in Section Five, consider whether a different version of the Second-Order Problem arises regarding quantitative properties.

Among adicity properties, the best candidates for being *accidental* second-order intrinsics are adicity properties of *multigrade* (alternatively, "variably polyadic") universals, distinguished precisely by their variable adicity.[41] Paradigm multigrade predicates include 'met with' and 'is surrounded by'. And, for those who endorse an abundant conception of properties, the successful deployment of these predicates is strong evidence for the existence of multigrade properties. For views that posit only sparse universals, the case for multigrade properties is more tentative. And, while there are no uncontroversial instances of fundamental physical multigrade properties, the possibility of fundamental properties with adicities that vary across worlds is *prima facie* plausible. It seems, for example, that one can readily conceive of multigrade fundamental properties—e.g., possible worlds where multigrade properties like *is bonded with* or *is collinear with* are among the fundamental physical properties.

Notably, however, Armstrong (1989: 40) defends the essentiality of adicity properties, arguing against multigrade universals by appeal to what he calls the *Principle of Instantial Invariance*: "For all numbers, *n*, if a relation is *n*-adic in one instantiation, then it is *n*-adic in all its instantiations." Armstrong takes this principle to be motivated by a "powerful truism" that "a universal is strictly identical in its different instances." And, since Armstrong holds that variation in adicity is incompatible with the "strict identity" of universals, he holds that universals must have their adicities essentially.

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[40] The next-best candidates for being accidental second-order intrinsics are arguably complexity properties like *being simple* or *being complex*. But see Armstrong (1989: 67, 1997: 33) for the case against variable complexity properties. Other potential candidates include the shape properties of instances of universals like *redness*, which would seem to vary with the shape of the bearers of *redness* (e.g., *redness* is larger when instantiated by a fire truck than a berry), but see Skow (2007) and McDaniel (2003) on the extrinsicality of shape properties. Thanks here to Dan Giberman.

[41] On multigrade properties and the essentiality of adicity, see MacBride (2005).

The force of this argument from the "strict identity" of universals is limited. If the strict identity of universals requires the sharing of *all* properties across instances, then, the fact that universals have different extrinsic features in different possible worlds would seem to flout this principle. Armstrong should therefore reject this reading of "strict identity." If, however, strict identity requires only sameness of the intrinsic properties of properties, then, as MacBride (2005) notes, Armstrong's argument seems to simply beg the question against multigrade properties, granted the plausible assumption that adicity is intrinsic. Consequently, Armstrong's appeal to the "strict identity" of universals cannot, when left unsupplemented, successfully rule out multigrade properties and, in turn, accidental adicity properties. And, since I know of no other good argument against the variable adicity of multigrade universals, we can tentatively assume their adicity is accidental in what follows.[42]

Now, in order for adicity properties of multigrade universals to generate a full-fledged Second-Order Problem, adicity properties must be intrinsic as well as accidental. It is worth considering, then, whether these adicity properties might be plausibly recast as relations (or extrinsic properties).

There are three good reasons to reject a view that identifies adicity properties with relations between universals and worlds or times. First, if we opt for this strategy, we ought to hold that all adicity properties, not just those of multigrade properties, are relations to worlds or times. But, since such a view requires that even the adicity properties of intuitively monadic second-order properties like *being a property* or *being mereologically complex* are relational, it is intuitively implausible. Second, and more seriously, if adicity features are relations to worlds, they make the adicity of impossible properties, instantiated at no world or time, wholly mysterious. Such properties have adicities even if there were no worlds to which they bear the *having such-and-such an*

[42] One view that sustains the merely apparent accidentality of adicity holds multigrade universals to be vastly complex, but partially unsaturated in most instances. On such a view, a multigrade property like *is compresent with* will be partially saturated by some individuals, but its essential "slots" nevertheless go unfilled. Here, I assume a "use it or lose it" view of adicity, according to which an instantiated *n*-adic property is such that some individual occupies each of its "slots."

adicity relation. So, if adicities are relations, the adicity of impossible properties is inexplicable. As a consequence, no plausible view of property intrinsics counts adicity properties as extrinsic. Third, if one wants to identify adicities of properties as relations to something they face the challenge of specifying what exactly they are relations to. But, if multigrade properties can vary their adicity across worlds, combinatorial commitments suggest that they can vary their adicity across times and regions as well. Moreover, there looks to be no principled barrier to the very same multigrade relation having different adicities at the very same world, time, and region—i.e., if some co-located objects stand in different patterns of a multigrade relation to one another. And, if there is no natural index to which adicities are relations, it looks yet more natural to take adicity as intrinsic.

Given that the Problem of Accidental Intrinsic Properties of Properties leads to serious problems for Aristotelians, they have reason to seek out a plausible view on which adicity properties like *being dyadic* are, in fact, relations. But, since adicity properties are not relations to worlds or times, the remaining alternative takes them to be relations between instances of first-order properties and the individuals that instantiate them. On this proposal, talk about the adicity of properties is to be analyzed in terms of the relation *is instantiated by* that holds between universals and individuals. Accordingly, an instance of some multigrade property *F* is dyadic in virtue of standing in the relation *is instantiated by* to two individuals, *a* and *b*, while, in a different monadic instance, *F* bears this relation to only a single individual, *c*. In this way, the adicity of first-order properties like *F* are determined by the number of entities to which they bear the *is instantiated by* relation. And, while this might be the best option for Aristotelians, if adicity is taken to be a relation between first-order properties like *F* and individuals, this account will owe an explanation of the difference between a state of affairs in which a single entity, *a*, bears a monadic instance of a multigrade universal *F* (e.g., when *Fa* is true) and another in which that same entity saturates all three argument places of a triadic instance of *F* (e.g., when *Faaa*). But, to distinguish between these cases, Aristotelians seem forced to appeal to some intrinsic feature of the *is instantiated by*

relation that accounts for the varying adicity of these instances of *F*, given that there is only a single *relatum*. But, if the difference between the monadic and triadic instances of *F* by *a* is a difference owing to an intrinsic property of the relation *is instantiated by*, this intrinsic property varies across these two instances. The problem of accidental intrinsic properties of properties we began with is therefore reinstated. Aristotelians who help themselves to this proposal will, then, either simply move the metaphysical bump elsewhere under the rug or be forced to collapse distinctions like the one between *a* being *F* and *a* bearing *F* to *a* and *a*.[43]

I've now argued that some adicity properties are accidental and all adicity properties are intrinsic, so at least some adicity properties generate a Second-Order Problem. Faced with this problem, we might attempt to develop a novel, unproblematic account of adicity properties or, instead, shrug it off by claiming that, while this does rule out the bilocation of multigrade properties, there's still no problem for any other properties. And, since the Second-Order Problem concerns only the extremely limited case of multigrade adicity properties, it is of precious little interest. Importantly, however, this response is at odds with Lewis' treatment of the First-Order Problem.

Lewis' assessment of the First-Order Problem proceeds from reflection on some cases of individuals bearing contrary or contradictory accidental intrinsics and draws the general conclusion that all possible individuals are worldbound. Lewis offers no argument against the possibility of certain kinds of entities that have only essential intrinsic properties. Rather, Lewis takes the fact that bilocation is a problem for some

[43] Another strategy would be to offer, not an analysis of second-order intrinsicality, but a sufficient condition for extrinsicality that guarantees adicity is extrinsic. Following a suggestion courtesy of an anonymous referee, Aristotelians might claim that, for any second-order property *F* and any property *G* that has *F* at *t*, *F* is an extrinsic property of *G* if whether *G* has *F* at *t* depends on *G*'s relations to the objects that instantiate *G* at *t*. Setting aside how to spell out the relevant dependence, even this *prima facie* plausible principle yields controversial verdicts. The property of *being a haecceity* seems to be an intrinsic property of *being Socrates*, but, since what is to be a haecceity is to be necessarily and uniquely instantiated by a specific individual, *being a haecceity* seems to depend upon *being Socrates'* relation to Socrates. A second case: Whether a property G has the property *being intrinsic* depends upon the relation that G bears to the object that instantiates it (namely, whether it is true in virtue of that object alone), but, plausibly, *being intrinsic* is itself intrinsic.

individuals to motivate a full-scale prohibition against bilocation—effectively ruling out any individuals being wholly at distinct possible worlds. If we follow Lewis' line here, the fact that bilocation across worlds is a problem for some properties, ensures that it is a problem for all properties.[44] So understood, the problems for the bilocation of multigrade properties yield a problem for all properties and, by parallel reasoning, this instance of the Second-Order Problem licenses us to reject any bilocation of properties across worlds. It looks, then, like the Second-Order Problem cannot be quarantined to the case of multigrade properties without impugning the broader Lewisian assessment of the First-Order Problem.

We've now examined one instance of the Second-Order Problem. In addressing it, Aristotelians have a range of options. They might deny the existence of multigrade properties or recast adicity as a relation. (They might also attempt to provide a metaphysics of multigrade universals according to which the distinctive adicity of multigrade universals is somehow essential, but, for reasons noted above, this seems to be simply the rejection of multigrade universals.) Given the contentious status of multigrade universals, each of the preceding options are likely to look more promising than abandoning the bilocation of universals across worlds (or times or regions). And, while I take this instance of the Second-Order Problem seriously, our interest in the next section is whether the Second-Order Problem arises as a consequence of more familiar modal and metaphysical commitments. As I'll suggest in the next section, a pressing version of the problem does arise for a certain Aristotelian view of quantitative properties that takes quantitative structure to be accidental.

§5. Quantitative Research

In this section, the preceding discussion of second-order intrinsicality is brought to bear upon the metaphysics of quantities. In doing so, we can consider whether the Second-

[44] Lewis takes bilocation across times to be possible but only at worlds "far away" in logical space, but rejects the parallel conclusion that, in some distant "neighbourhoods" of logical space individuals are bilocated across worlds.

Order Problem arises for a fairly natural view about the nature of quantitative properties. As I'll argue, Aristotelian views on which quantitative properties have their quantitative structure accidentally are likely committed to accidental second-order intrinsics.

A suitable metaphysics of quantitative properties must account, not only for our claims about the ordering of quantities—e.g., that *5 grams mass* is greater than *2 grams mass* and less than *8 grams mass*—but also for claims about the "distances" between quantities.[45] Claims of this sort hold, for example, that the distance between *2 grams mass* and *3 grams mass* is smaller than the distance between *200 grams mass* and *300 grams mass*. Since the metric structure of quantities cannot be reduced to the merely topological ordering of quantities, any tenable view of quantities requires second-order relations among first-order determinates that yield a quantitative structure considerably richer than a mere ordering.[46] And, granted second-order relations of *less than or equal to* and *sum of*, the property realist can recover the requisite metric structure of quantities. But, in adopting an ontology of second-order relations among first-order quantitative properties, questions quickly arise about the nature of these second-order relations. And, as with the constituency relation discussed in Section Two, two kinds of views about these second-order metric relations suggest themselves.

On the first view, these second-order metric relations are external relations between mass determinates. As noted above, external relations are relations that fail to supervene upon the intrinsic nature of their *relata* taken separately yet supervene upon the intrinsic nature of their mereological sum. Again, paradigm cases of external relations are therefore spatial and temporal ones like *is five feet from*. On the second view, these relations are *internal* relations like *is a duplicate of* and therefore supervene upon the intrinsic nature of their respective *relata* taken separately. So understood, the first option, according to which the relevant second-order relations are external, denies that the intrinsic properties of properties—e.g., in the case of *mass*, first-order *mass* determinates

[45] See, e.g., Mundy (1987) and Eddon (2007).
[46] See Eddon (2007, 2013) on the case against a constituency-based view of quantitative properties.

like *having 2 grams mass*—suffice to fix the patterns of *less than or equal to* and *sum of*. In contrast, the latter view, according to which these relations are internal, holds that the intrinsic properties of mass properties are sufficient to ground the quantitative structure of mass.[47] Put differently: the second-order quantitative relations supervene upon the intrinsic nature of the first-order *mass* determinates.

So, are the second-order quantitative relations of *less than or equal to* and *sum of* internal or external relations? Internal, it would seem. First, if these second-order relations are external, they would be subject to combinatorial principles, requiring that, for any way of holding among *mass* determinates, there is some world where they hold that very way.[48] And, while metric structure might be modally variable, this is too much modal variation for a plausible metaphysics of properties to bear. It would, for example, require that, possibly, *2 grams mass* is greater than *200 grams mass* and that the distance between *2 grams mass* and *3 grams mass* is greater than the distance between *2 grams mass* and *2000 grams mass*. I'm as modally liberal as the next philosopher, but countenancing these barely coherent possibilities nevertheless seems to be a theoretical vice.

Second, if these second-order relations of, say, *mass* are not internal, they depend upon something other than the intrinsic nature of first-order *mass* determinates, but it is simply unclear what these relations might depend upon if not the first-order *mass* determinates. And, if no plausible account of what the features distinct from *mass* determinates are which determine the relevant second-order relations, there is defeasible reason to think these relations are, in fact, internal. And, while this might require positing especially rich intrinsic natures of *mass* determinates, this is a more plausible stance than the alternative.

Third, I take it that the determinate-determinable relation that holds between, say, *redness* and its determinates like *being crimson* is metaphysically analogous to the

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[47] Here, an absolutist conception of quantities is assumed rather than a comparativist view, which holds the second-order metrical relations to be fundamental. For comparativists, accidental metric structure is a natural result of holding second-order relations to be more fundamental than first-order determinates. On absolutism and comparativism, see Dasgupta (2013) and Baker (2010).

[48] On combinatorialism, see Lewis (1986) and Schaffer (2005).

relevant second-order relations over *mass* determinates. And, since the former is most naturally taken to be internal rather than external, this is yet more evidence that the relevant second-order quantitative relations are internal.

If these second-order quantitative relations are internal relations fixed by the intrinsic nature of first-order determinates, then, given certain modal commitments, the Second-Order Problem isn't far off. This is because these internal relations would depend only upon the intrinsic nature of determinates. And, if they depend only upon the intrinsic nature of these properties, then differences in these second-order relations would have to be grounded in differences in the first-order relations. For example, in the case of *mass*, if the metrical structure of *mass* differs, this difference must be grounded in differences in the intrinsic nature of the first-order *mass* determinates. For this reason, contingency with respect to second-order metrical relations among *mass* determinates requires that first-order *mass* determinates have accidental intrinsic properties after all. Put a bit differently: if second-order metric relations that fix the metric structure of quantities vary from world to world and these relations are internal, then their variability requires that first-order determinates have some intrinsic properties only accidentally.

Like most of metaphysics, there are ways to push back against this conclusion. Most obviously, one might argue for the externality of the second-order quantitative relations; however, Aristotelians of the relevant sort should take the lurking worry of a Second-Order Problem to furnish them with an answer to a difficult modal question about quantities—namely, is the metric structure of quantities accidental?[49] For the Aristotelian wary of the Second-Order Problem, the preceding concerns about second-order intrinsics give us reason to think that metric structure is essential upon pain of having to abandon the identity of universals across worlds.

While ruling out accidental metric structure might seem to be a minor insight, it proves useful for discerning the modal features of properties. It means, among other

[49] On the modal status of second-order metrical relations, see Dasgupta (2013) and Eddon (2013). On the quantitative structure of properties, see Nolan (2008).

things, that certain distinctively quidditist possibilities are quickly ruled out—namely, those where quantities with different metric structures "swap" roles. In this way, the Aristotelian who opts for the essentiality of metric relations notably limits the sphere of possibilities admitted by would-be quidditists by ruling out paradigmatic instances of quidditistic differences that would require properties with, say, real-valued quantitative structure swapping roles with properties exhibiting different quantitative structure. So, for example, if the fundamental quantitative structure of *mass* and *charge* differ, then the most familiar example of a quidditistic possibility—i.e., where *mass* and *charge* swap causal nomic roles—is ruled out immediately by the Second-Order problem.

Accordingly, this concern about quantity is further evidence that no adequate view of the metaphysics of intrinsicality can omit attention to second-order intrinsicality. So, while adicity properties of multigrade universals still threaten to saddle Aristotelians with a difficult version of the Second-Order Problem, careful examination of second-order metric relations actually affords Aristotelians a useful insight into the nature of quantities.[50][51]

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[50] Views that ground laws in the second-order intrinsic properties while holding properties have their nomic roles accidentally almost certainly face a version of the Second-Order Problem.

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