Applications of Hyperintensionality in Metaphysics

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1. Introduction

Hyperintensionality concerns differences between necessary equivalents. For instance, consider the numerical properties of *having an irrational square root*, and *not being a perfect square*. Because it can be proven that no whole number can have one property without having the other, the two are necessary equivalents. Yet, necessary "sameness" notwithstanding, differences hold between the two properties.

A classic example compares the truth-value of statements like "I believe 12 has an irrational square root" and "I believe 12 is not a perfect square". If I did not know about irrational numbers, then only the latter would be true when I consider the number 12. Another putative difference concerns the claims, "12 is not a perfect square in virtue of its having an irrational square root" and "12 has an irrational square root in virtue of its not being a perfect square". One could argue that the first claim is true and the second is false like so: having an irrational square root is directly disqualifying for being a perfect square, since being a perfect square just is having a whole number square root; on the other hand, general facts about the factorization of numbers are needed to prove that non-perfect squares have irrational square roots.

These two examples correspond to two rough categories that have been identified in the literature.[1] Cases like the former, which turn on *epistemic*, or *linguistic*, or *psychological* details, are commonly described as "representational". Cases like the latter one, which might be argued to pertain to "how things are" and not merely "how things are for us", are often described as "metaphysical". (cf. Nolan 2014, p. 8)

Recently, there has been much interest in the application of hyperintensional concepts to metaphysical questions. This paper will survey such applications, with an emphasis on the diversity of ways that these concepts have been employed. After establishing some preliminary background on hyperintensionality (§2), I will discuss grounding (§3a), non-grounding approaches to fundamentality and metaphysical dependence (§3b), essence (§4a), distinctions between types of properties (§4b), impossible worlds and hyperintensional propositions (§5), and explanation and metaphysical theory equivalence (§6). Then, I will conclude (§7) with some general observations about hyperintensionality in metaphysics, drawing from the various topics discussed earlier.

2. Preliminaries

2.1. A General Characterization of Hyperintensionality

Despite some variation among specific formulations of hyperintensionality, shared by all is some form of *necessary equivalence*. For instance, the term "hyperintensionality" was coined in (Cresswell 1975) in terms of the *logical equivalence* of propositions, but a link to necessity can be found in the basic details of the account.

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[1] Particularly (Nolan 2014), which offers a detailed discussion and defense of this division, as well as further examples.

Said account involves linguistically structured propositions[2] which correspond to *intensions* of the canonical sets-of-possible-worlds variety.[3] Logical equivalence of Cresswellian propositions ("C-propositions") is then defined as obtaining between any two C-propositions which share an intension (Ibid., p. 27). Now, a familiar suggestion is that a C-proposition is *necessary* if its intension is the set of all possible worlds. So, we can say that two C-propositions are logically equivalent iff the C-proposition asserting their equivalence is necessary, that is, has as its intension the set of all possible worlds, which it will exactly when the two purportedly equivalent C-propositions share an intension. So, the logically equivalent propositions can fairly be called necessary equivalents, because the C-proposition asserting their equivalence is necessary.

While it is instructive to see how Cresswell's original account indeed involves a sort of necessary equivalence, a more general and theoretically neutral picture would be preferable, one involving no commitments to a specific theory of propositions and accompanying tailor-fit picture of necessity. (Nolan 2014) offers just such a generalization with what I will call his *sentence position account* of hyperintensionality. This account has two pillars: first, that hyperintensionality can be directly attributed to *positions* in a sentence, and secondly, that hyperintensionality can be indirectly attributed to worldly phenomena based on the presence of hyperintensional positions in the sentences used to characterize the phenomenon in question.

The first pillar of Nolan's account is the most continuous with Cresswell's original account. *Sentences* are used in place of Cresswell's specific and detailed account of *propositions*. This brings some of the theoretical neutrality that we seek, since sentences are understood here in a fairly theoretically uncommitted way: we need only accept that (i) sentences have truth-values, and that (ii) sentences are made up of *expressions*, which occupy *positions* in a sentence such that other (syntactically appropriate) expressions can be *substituted* into that position to yield a different sentence. A *sentence position* is hyperintensional if *necessarily equivalent expressions* need not preserve the sentence's truth-value, that is, if there is at least one pair of necessarily equivalent expressions syntactically appropriate for the position in question that result in differing sentence truth-values.[4] We also need some way to understand when expressions are necessarily equivalent; Nolan suggests the criterion of *intensional equivalence* (Ibid., p. 3). This is another source of theoretical neutrality; we are left with room to plug in alternatives to the canonical sets-of-possible-worlds account of intensions if we wish.

The second pillar of Nolan's account is important for the goal of exploring applications of hyperintensionality in metaphysics. This is because it allows for the attribution of hyperintensionality to "things out in the world", in addition to positions in sentences. However, this pillar of Nolan's account is also less clear than the former one, because of the central role it gives to the *sentences used to characterize* a given

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[2] "This work will explore the analysis of propositions which assumes that they are *structured* entities, and that the clue to their structure is found in the sentences which express them." (Ibid., p. 27)

[3] "Suppose that we were to give up the idea that a proposition is a set of possible worlds. We might, if we wish, say that nevertheless a proposition *determines* a set of possible worlds. Let us call this set of worlds the *intension* of the proposition." (Ibid., p. 25)

[4] (Bacon 2019) works in a similar vein, building off of the notion of *substitution* in a formal type theoretic framework. Theoretical neutrality is also a central aim for Bacon, who provides general means to compare and contrast various accounts of propositions that differ in granularity. Although the paper is not primarily an *account* of hyperintensionality, its general framework for considering proposition granularity is a helpful resource for any hyperintensional theorist. (Dorr 2016) is another paper which explores questions of fineness of grain through the formal analysis of sentences, with the main goal of analyzing *identifications*, claims of the form, "to be F is to be G".

phenomenon. As Nolan notes, we might consider which sentences we currently *do* use to characterize a phenomenon, or we might consider which sentences it would take to in some sense *adequately* characterize a phenomenon (Ibid., pp. 3-4). The latter option seems more appropriate for metaphysics, but it will leave room for debate as to what sort of language is needed to adequately characterize a given phenomenon.

So, what Nolan's account does is supply a *criterion* that a phenomenon must satisfy in order to be counted as hyperintensional, making it possible to regiment disputes over specific cases. Is phenomenon X hyperintensional? If you think so, your job is to show that it cannot be described without sentences with hyperintensional positions. If you think not, your job is to show that it can be described without sentences with hyperintensional positions. And the question of the hyperintensionality of a position in a sentence is clear-cut enough to render unlikely further disputes at the sentence level.

2.2. Hyperintensionality and Modality

Because hyperintensionality is characterized through necessary equivalence, there is a close connection between hyperintensionality and modality. In a revealing terminological decision, (Sider 2020) extensively considers competing theories that cannot be distinguished in modal terms alone, yet the book eschews the term "hyperintensional" almost completely[5] in favor of the term "postmodal". Given how *hyperintensionality* involves "looking beyond" necessary equivalence, the concept of *postmodality* must fall in nearby territory.

The primary difference between Nolan's hyperintensionality and Sider's postmodality is that of domain: the former is ultimately rooted in language and representation, and may find *application* to metaphysical contexts, but the latter is understood as metaphysical from the start. For instance, Sider characterizes ground as being "metaphysical, not apriori", but "tighter than a merely modal connection" (Ibid., p. 12). Instead of detouring through language, Sider directly stipulates something along the following lines: "you're familiar with metaphysical modality; these postmodal phenomena are metaphysical like that, but they occur at a finer level of detail than modal phenomena".

A plausible analogy emerges: hyperintensionality is to postmodality as intensionality is to modality. While intensions *can* be used to represent modality understood as a metaphysical phenomenon, they can also be used to represent merely *apparent* modality that is the result of epistemic ignorance.[6] Likewise, while hyperintensional sentence positions might reflect metaphysical phenomena that can be characterized as postmodal, they can also reflect artifacts of our representational systems and limitations of our ignorance-laden epistemic perspectives.

In this paper, I will favor the hyperintensionality-centric model of how to attribute hyperintensionality, and thus postmodality, to particular phenomena. This is because of the dispute-clarifying potential of the criterion discussed above: whether or not a phenomenon can be adequately described in terms of sentences

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[5] The exception is a single occurrence where the term appears in scare quotes. (Ibid., p. 121)

[6] See Kripke, on a clash between *apparent* or *epistemic* contingency and *genuine* or *metaphysical* necessity: "First, there's one sense in which things might turn out either way, in which it's clear that that doesn't imply that the way it finally turns out isn't necessary. For example, the four color theorem might turn out to be true and might turn out to be false. It might turn out either way. It still doesn't mean that the way it turns out is not necessary. Obviously, the 'might' here is purely 'epistemic'—it merely expresses our present state of ignorance, or uncertainty." (Kripke 1980, p. 103)

without hyperintensional positions. Foregrounding hyperintensionality brings one further advantage: when discussing a phenomenon whose status as "metaphysical" is under contention, we can make attributions of hyperintensionality that will hold up either way. Whether or not a corresponding attribution of postmodality will hold up can then be settled, along with the metaphysical status of the target phenomena, after the fact.

2.3. Some Things That Can Be Hyperintensional

Before launching into the literature review of applications of hyperintensionality in metaphysics, it will be useful to assemble a basic inventory of some things that can be hyperintensional.

First, **hyperintensional sentence positions** were described above in the summary of Nolan's sentence position account (§2.1): "a *sentence position* is hyperintensional if *necessarily equivalent expressions* need not preserve the sentence's truth-value, that is, if there is at least one pair of necessarily equivalent expressions syntactically appropriate for the position in question that result in differing sentence truth-values".

TRUE: The child believes that there are 8 planets in the solar system.

FALSE: The child believes that there are 14.4 ÷ 1.8 planets in the solar system.

Case 1: A hyperintensional sentence position (underlined). Substituting a necessarily equivalent expression can change the truth-value of the sentence.

Hyperintensional sentence positions are linguistic, thus representational, entities; it will be helpful to also introduce a more general concept for referring to cases that could be worldly, representational, or both. A **hyperintensional difference** is a difference that obtains between necessary equivalents, or necessarily equivalent expressions. If there is hyperintensionality, then there are hyperintensional differences, for hyperintensionality obtains just when there is a difference between necessary equivalents or necessarily equivalent expressions. Here, *difference* is meant in a theoretically neutral manner; depending on the choice of metaphysical theory, a difference might be constituted by (to list just a few examples) an asymmetric relation that obtains between two objects in one direction but not the other, a Russellian fact asserting some difference between things, or a hyperintensional sentence position. This last item does have a special status because, on Nolan's account, all hyperintensional differences will be witnessed by some hyperintensional sentence position. However, this linguistic witness need not be understood in a metaphysically loaded way.

A **hyperintensional relation** is a relation that is sensitive to differences between necessary equivalents in the following sense: it holds between some pair of relata, but fails to hold between at least one pair of necessary equivalents of each of those relata.[7] The most typical sort of hyperintensional relations are asymmetric relations such as *grounding* which may hold between necessary equivalents in one direction, but not the other; in this special case, the relata are simply swapped with each other to produce a case where the relation doesn't hold from a case where it does.

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[7] Note that this allows for leaving one of the relata unchanged, since identity suffices for necessary equivalence. Also, this definition easily generalizes to relations involving more or fewer than two relata; this will come up in §3b.1.

TRUE: <u>8</u> is believed by the child to be greater than <u>7</u>.

FALSE: <u>14.4 ÷ 1.8</u> is believed by the child to be greater than <u>7</u>.

Case 2: A hyperintensional relation. Only one of the hyperintensional positions had to be changed to demonstrate hyperintensionality in this case.

TRUE: <u>Chemical properties</u> are grounded in <u>physical properties</u>.

FALSE: <u>Physical properties</u> are grounded in <u>chemical properties</u>.

Case 3: A plausible grounding claim, and its reverse. The relation is hyperintensional because it obtains asymmetrically between necessary equivalents.

This grounding example suggests that the above definition of *hyperintensional relation* is aligned with the postmodal approach (see §2.2), as it directly concerns *necessary equivalents* which might be worldly things like properties.[8] The hyperintensional approach yields a more cautious definition: a **thin hyperintensional relation** is a relation such that there is some sentence attributing this relation where one or both of the relata sentence positions is hyperintensional. Thin hyperintensional relations cannot directly entail that any worldly phenomenon X is hyperintensional (thus postmodal), since their sentence position based definition concerns *necessarily equivalent expressions*. So, it must first be established that the expressions they relate have a worldly *referent*; certain nominalist or anti-realist readings of the relevant expressions must be ruled out, to show that the subject matter of those expressions concerns some worldly phenomenon X. Only then can Nolan's criteria (see §2.1) deliver the verdict that said phenomenon X is hyperintensional, *if* X cannot be characterized in non-hyperintensional terms which avoid the thin hyperintensional relation at issue.

This concludes our tour of some basic things that can be hyperintensional. While it has been far from exhaustive, we will encounter more things that might be hyperintensional in the literature review below.

3a. Grounding

One of the flagship applications of hyperintensionality in metaphysics is *grounding*: approximately, a metaphysical relation in which one phenomenon obtains "in virtue of" another phenomenon. To be a bit more concrete, we are here interested not in cases of cause and effect,[9] but instead in such diverse cases as how a group of neighboring atoms brings about a polar molecule, or how a collection of sound waves brings about a beautiful song, or how a string of letters and spaces brings about a meaningful sentence.

The section will proceed as follows. First, §3a.1 will address the question "What is Grounding?", canvassing some central characteristics of the grounding relation which are agreed upon across various specific accounts of grounding. Then, §3a.2 and §3a.3 will respectively consider two important questions on which grounding theorists disagree: is grounding a unified relation encompassing all cases of metaphysical dependence, and what sort of relata does grounding relate? Finally, §3a.4 will consider the relationship between grounding and the closely related notion of *fundamentality*.

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[8] And such properties might be understood in a non-nominalist (or "thick") manner, for all the definition says.
[9] Though many grounding theorists do see a close link between grounding and causation; see (Audi 2012, p. 688). However, see (Bernstein 2016b) for a discussion of why causation might not be particularly analogous to grounding.

3a.1. Agreed-Upon Characteristics of Grounding

First things first: grounding is a *relation*. It is a *primitive* relation; it cannot be analyzed in a non-circular manner.[10] It is a *hyperintensional* relation, in the sense described above (§2.3): a grounding relation may obtain between two relata, yet fail to obtain when one or both relata are substituted for some necessary equivalent.[11] And, one of the most important distinguishing characteristics of grounding is that it is *explanatory*; the grounding relatum is taken to "account for" the grounded relatum, which in turn holds "in virtue of" the grounding relatum (Fine 2001, p. 15). Or again, the grounding relatum "explains why [the grounded relatum] obtains" (Rosen 2010, p. 117).[12]

Formally, the grounding relation is usually agreed to be *irreflexive* (nothing grounds itself), *asymmetric* (no two things both ground each other), and *transitive* (if *a* grounds *b*, and *b* grounds *c*, then *a* grounds *c*).[13] Additionally, things can have *multiple grounds*; one thing can be grounded by multiple other things.[14]

3a.2. Is Grounding a Unified Relation of Metaphysical Dependence?

Prominent grounding theorists have contended that grounding is a unified relation of metaphysical dependence.[15] This is to suggest that every case of metaphysical dependence is a case where something grounds something else, and so to deny that metaphysical dependence might not always involve grounding.

To evaluate this claim, we need some basic understanding of metaphysical dependence that does not prejudge the issue. Rosen's refreshingly cautious exposition of the topic provides a useful guide: rather than to stipulate a relation that shall be known as "grounding", Rosen begins by gesturing towards "idioms of metaphysical determination and dependence", and freely shifts between talk of "dependence", "grounding", and "the 'in virtue of' idiom" (Rosen 2010, pp. 109-113). While Rosen ultimately takes up "the working hypothesis that there is a single salient form of metaphysical dependence to which the idioms we have been invoking all refer" (Ibid., p. 114), his exposition makes vivid the live alternative hypothesis that such a unified "grounding relation" is not the whole story on metaphysical dependence.

One grounding theorist who denies this unification hypothesis is Ney, who suggests that grounding can work alongside *realization*, another metaphysical dependence relation (Ney 2016, pp. 273-274). Ney's account endorses or is neutral on every aspect of the consensus description of grounding canvassed above (§3a.1), so although it rejects unification, it is still clearly a grounding account.

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[10] See (Schaffer 2009, p. 364), (Rosen 2010, p. 113), (Audi 2012, p. 690, fn. 9), and (Ney 2016, p. 272). Note that Rosen more cautiously suggests that "we will be accepting it as primitive, at least for now".

[11] See (Schaffer 2009, p. 364), (Rosen 2010, pp. 124-126), and (Bennett 2011, p. 84, fn. 10).

[12] The view that grounding is explanatory is even shared by critics of the relation: Wilson emphasizes the explanatory character of grounding, so as to make a case against the relation by arguing that the otherwise bare-bones nature of the grounding relation is incompatible with its being *explanatory* in any meaningful way. (Wilson 2014, p. 553)

[13] See (Schaffer 2009, p. 376) and (Rosen 2010, p. 116); Rosen does hedge that grounding is "not obviously transitive". Fine makes a distinction between *full* and *partial* ground, endorsing transitivity only in the case of partial ground (Fine 2012, pp. 55-56). Also, (Thompson 2016) gives an account of grounding that denies asymmetry. Thompson further notes that if grounding is not asymmetric but is transitive, it is not irreflexive. (Ibid., p. 42)

[14] See (Fine 2001, p. 15), (Schaffer 2009, p. 376), (Rosen 2010, p. 115), and (Audi 2012, p. 696).

[15] See (Fine 2001, p. 28), (Schaffer 2009, pp. 376-377), and (Rosen 2010, p. 114).

It is also worth distinguishing the claim that ground unifies metaphysical dependence from the claim that ground itself is unified. Fine denies the latter claim, suggesting that we can distinguish metaphysical, natural, and normative forms of ground (Fine 2012, pp. 38-39). However, Fine's metaphysical ground is meant to underlie all questions of factuality (i.e. realism vs anti-realism) and fundamentality (i.e. reductionism vs non-reductionism), and so it plausibly covers all cases of metaphysical dependence. (Fine 2001, p. 28)

Another interesting account is Bennett's theory of *building relations*, which like Ney's account, allows that a grounding relation might exist alongside other building relations like *composition*, *constitution*, *realization*, *microbased determination*, and *emergence* (Bennett 2011, pp. 81-85). This picture does rule out grounding as a unified metaphysical dependence relation, but Bennett goes on to suggest that there might be an abstract *unified building relation* which encompasses all of these individual relations (Ibid., pp. 88-89). So, although Bennett's theory does not use grounding to unify metaphysical dependence, it does aim to unify metaphysical dependence via a relation that retains some of the attributes of grounding discussed in §3a.1.

Finally, there is also the position that grounding does not have *any* role to play in metaphysical dependence, much less a unifying one. Wilson defends this claim, arguing that various "small-g" grounding relations like *type identity*, *functional realization*, the *mereological part-whole relation*, and the *determinable-determinate relation* already occupy the roles that would be occupied by the "big-G" Grounding relation advanced by grounding theorists. (Wilson 2014, p. 539)

3a.3. What Sort of Relata Does Grounding Relate?

This section will focus on two big questions regarding what sort of relata stand in grounding relations to one another. The first question is whether grounding relata must *exist* or be *real* in some robust sense, which might initially seem like a silly question. As Schaffer puts it:

> "Metaphysics so revived does not bother asking whether properties, meanings, and numbers exist. Of course they do! The question is whether or not they are *fundamental*." (Schaffer 2009, p. 347)

However, Fine makes a point of asserting that his relation of grounding can be understood as a relation between *sentences* (making it a *thin hyperintensional relation* as described in §2.3), to allow for grounding claims to float free of matters of ontology and realism (Fine 2001, p. 16). Ney emphasizes how Fine's account allows for the relata of grounding to be understood in an anti-realist manner, and uses this feature to rebut grounding skeptics like Wilson who argue that there is no unoccupied role for grounding to satisfy:

> "Because ground is an operator on entire sentences, not individual entities, it plays a different role than most of these notions (certainly identity, realization, and causation, which link an entity or entities). It allows us to discuss cases in which the target sentence uses noun phrases that do not correspond to genuine ontology." (Ney 2016, p. 286)

The second question concerns differences among accounts like Schaffer's which would understand grounding claims as "ontologically loaded" rather than merely linguistic. Such accounts differ on the exact nature of the relata of grounding; roughly, the question is whether grounding relates *facts*, or *things*?

Rosen and Audi explicitly take grounding to be a relation among facts, understood as "structured entities built up from worldly items" (Rosen 2010, p. 114), "individuated by their worldly constituents (objects, properties, relations) and the manner of their combination" (Audi 2012, p. 686); such facts can be likened to Russellian propositions. On the other hand, Schaffer suggests that grounding accepts relata of "arbitrary ontological category" (Ibid., pp. 375-376).[16]

We will wrap up by distinguishing *ground* and *truthmaking*, as a crucial difference between these two similar relations is what relata they accept. Fine offers the following characterization of said difference:

> "The relation of truth-making relates an entity in the world, such as a fact or state of affairs, to something, such as a statement or proposition, that represents how the world is; and the intended understanding of the relation is that the *existence* of the worldly entity should guarantee the *truth* of the representing entity. Ground, on the other hand, is perhaps best regarded as an operation (signified by an operator on sentences) rather than a relation (signified by a predicate). But insofar as it is regarded as a relation… …[the entities it relates] should probably be taken to be worldly entities, such as facts, rather than representational entities, such as propositions. Thus it is that the ball is red and that the ball is round that makes it the case that the ball is red and round, and not the existence of the *facts* that the ball is red and that the ball is round that make the *proposition* that it is red and round true." (Fine 2012, p. 43)

So, roughly, truthmaking is a sort of link between the metaphysical ("worldly") and the representational. The supporting relatum is always worldly, and the supported relatum is always representational. Against this, Fine urges that the relata of grounding should be uniform to allow for hierarchical *chaining*.[17]

3a.4. Grounding and Fundamentality

Closely related to grounding is the familiar hierarchical concept of *levels of reality*. To give an example, this idea is at work in the claim that biological phenomena "boil down" to chemical phenomena, which in turn boil down to physical phenomena. We might wonder, how exactly do higher levels boil down to lower ones, or rather, how is it that lower levels *make it the case* that higher levels obtain? One answer to this question is that *grounding relations* are responsible for the relationship between the higher and lower levels.

Fundamentality comes into the picture because lower levels are often described as being more fundamental than higher ones. This terminology suggests a natural question: is *relative* fundamentality, as just described, the whole story, or is there also *absolute* fundamentality? In other words, is there a lowest level, such that everything boils down to it, but it doesn't boil down to anything else? To employ an informal but evocative description from Sider, is there "such a thing as what is ultimately going on"? (Sider 2020, p. 211)

Grounding theorists have suggested a grounding-based definition of (absolute) fundamentality:

"*Fundamental*: x is fundamental $=_{df}$ nothing grounds x." (Schaffer 2009, p. 373)

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[16] Relatedly, for Sider the matter of appropriate relata is a key difference between ground (which relates *facts*, for Sider) from his "sub-factual" notion of *fundamental concepthood* which applies to non-fact *components* of facts. (Sider 2020, p. 16)
[17] (Ibid., pp. 43-46). However, note that Fine does endorse truthmaking as a *semantics* for ground. (Ibid., p. 71)

If we accept this view, then the question of whether anything is absolutely fundamental turns on the structure of the network of grounding relations between things. However, as we will discuss in §3b.1, other theorists such as Wilson reject the idea that absolute fundamentality is to be analyzed in terms of grounding or any other relative notion of fundamentality. Indeed, even some grounding theorists reject this idea:

> "It is natural to understand the concept of fundamental reality in terms of the relative concept of one thing being *less fundamental* than, or *reducible* to, another—the fundamental being whatever does not reduce to anything else… …what I would like to suggest […] is that we reject the idea that the absolute notion of fundamentality is in need of a relational underpinning." (Fine 2001, p. 25)

3b. Non-Grounding Approaches to Fundamentality and Metaphysical Dependence

We will now turn to consider non-grounding accounts of fundamentality and metaphysical dependence, to consider whether these accounts are hyperintensional, and how their application of hyperintensionality might differ from that of grounding theories. First, §3b.1 will consider accounts of absolute fundamentality that take it as primitive rather than grounding-based, as advocated by Fine and Wilson. Then, §3b.2 will discuss Wilson's *causal powers subset* account, as applied to strong emergentism and nonreductive physicalism.

3b.1. Primitive Hyperintensional Absolute Fundamentality

As we have seen (§3a.4), even some grounding theorists endorse taking absolute fundamentality as an independent primitive. What does this amount to? Fine offers a positive characterization of the fundamental as being that which concerns "*Reality*" and its intrinsic structure:

> "Even though two nations may be at war, we may deny that this is how things really or fundamentally are because the entities in question, the nations, and the relationship between them, are no part of Reality as it is in itself. […] Thus it is this positive idea of the intrinsic structure of reality, rather than the comparative idea of reduction, that should be taken to inform the relevant conception of what is fundamental or real." (Fine 2001, p. 25)

Wilson agrees that fundamentality is primitive, but suggests that we can go into a bit more detail:

> "It follows from some goings-on's being fundamental at a world that these goings-on, individually or together, provide a [small-g] ground… …for all the other goings-on at the world. Which entities are in the fundamental base is primitive; this primitive specification then *fixes the direction of priority* (if there is one […]) associated with a given specific 'small-g' grounding relation, when applied to goings-on in the base; effectively, fundamentality is hyperintensional." (Wilson 2014, p. 561)

So, the suggestion is that a privileged class of *goings-on* (or, if one prefers, *facts*, *states of affairs*, *phenomena*, *entities*, etc.) primitively *are fundamental*, and while goings-on that lack primitive fundamentality are each small-g grounded in primitively fundamental goings-on, this relational fact is not *definitive* of fundamentality.[18]

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[18] Wilson helps to motivate this picture by noting two live theoretical possibilities that would preclude such a relational account of fundamentality: fundamental goings-on might mutually ground each other, or might ground themselves. (Ibid., pp. 560-561)

If one accepts such a picture, wherein lies the hyperintensionality of fundamentality? It cannot be that fundamentality is a *hyperintensional relation*, for fundamentality is a *property* of certain goings-on, not a *relation* that can hold between pairs of goings-on. However, perhaps on this picture fundamentality can *yield* hyperintensional relations, through its role in *fixing the direction of priority* of small-g grounding relations.

To use Wilson's nearby example (Ibid., p. 561), it might be that the One is fundamental, or it might be that the Many are fundamental. How this turns out will fix the *direction of priority* of the mereological relationship between the two in that it will determine which "end of the spectrum" is the fundamental end: the composite end of the One, or the discrete end of the Many. We would then have hyperintensionality if the One and the Many are necessary equivalents; this is plausible, if by "the One" we mean something like "the whole universe" and by "the Many" we mean something like "all the stuff in the universe".

However, even without Wilson's theory on determining the fundamental end of the "mereological spectrum", mereological composition is in fact *already* a hyperintensional relation (given that the One and the Many are necessary equivalents). Just note the following underlined *hyperintensional sentence positions*: "The <u>One</u> is mereologically composed of the <u>Many</u>". We can swap these necessarily equivalent relata to produce a false sentence from this true one. So, the hyperintensionality of Wilson's primitive fundamentality is not to be located in its role in fixing the direction of priority of small-g grounding relations, because no such direction is needed for those relations to be hyperintensional.

Our mistake was to seek the hyperintensionality of primitive fundamentality in its *consequences*, versus its basic characteristics. We can find the relevant hyperintensional sentence positions simply in bare attributions of fundamentality like "The <u>One</u> is fundamental" and "The <u>Many</u> are fundamental". So, where the hyperintensional relations we have discussed are witnessed by sentences with hyperintensional sentence positions for one or both of the relata, in this case the witness sentences have just one such position, for the thing that the property of (absolute) *fundamentality* is being attributed to.

We can arrive at a unified understanding of these cases by noting that properties are attributed by one-place predicates, as in "the _____ is *tall*", just as relations are attributed by two-place (or *n*-place) predicates, as in "the _____ is *taller than* the _____".[19] Because (as stated in §2.3) a relation is hyperintensional if one or more of its relata sentence positions (i.e. *places* of the relation predicate) is hyperintensional, the analogous situation for a property is for the sentence position of the target of the property attribution (i.e. the *place* of the property predicate) to be hyperintensional. So, we can generalize the notion of a hyperintensional relation to apply to anything attributed by an *n*-place predicate, based on the same criteria that at least one of the sentence positions corresponding to the *places* of the predicate is hyperintensional.

Since one-place predicates attribute *properties*, it makes sense to describe fundamentality as a **hyperintensional property**. Because, the target of the attribution of fundamentality (i.e. the *place* of the

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[19] This account of predicates as having "places" is used in first-order logic. Here, the general notion of an *n*-place predicate will only be used to argue that properties like fundamentality are attributed by predicates which satisfy a general sentence position criterion for hyperintensionality which also applies to what we have called *hyperintensional relations*. I mean to leave open the following stronger claim: that this formal unity between properties and relations supports the metaphysical conclusion that properties and relations are in some deep sense "the same kind of thing".

predicate "fundamental") in sentences like "The <u>One</u> is fundamental" is in a hyperintensional sentence position, and so the stated criteria for the hyperintensionality of *n*-place predicate attributions is satisfied.

3b.2. Metaphysical Dependence: The Causal Powers Subset Strategy for Interlevel Metaphysics

Interlevel metaphysics concerns the *levels of reality* picture discussed earlier (§3a.4), in which the biological boils down to the chemical, which boils down to the physical, and so on. A central question concerning this hierarchical picture is the nature of the connections between the levels. Grounding (of the sort discussed in §3a) is one proposed answer to this question, but it is not the only one. Putting aside the exact nature of the connections between the levels, another question is whether the levels are metaphysically distinct. Or, as it is often put, whether the higher levels are "something over and above" the lower levels, as the terminology of "higher" and "lower" suggests. This question of whether the higher levels are *emergent* in some deep sense has been discussed extensively in the context of certain crucial interfaces between layers, such as that between the mental and the physical, as well as between the chemical and the physical.

Traditional accounts of such interfaces utilized the concept of *supervenience*, a relation between domains in which there can be "no change in one without some change in the other". It is common to formulate this relation in terms of properties, and this will suffice for our purposes here. Take Kim's definition:

> "A *strongly supervenes* on B [where A and B are families of properties closed under Boolean operations] just in case, necessarily, for each x and each property F in A, if x has F, then there is a property G in B such that x has G, and *necessarily* if any y has G, it has F." (Kim 1984, p. 165)

So, if some domain (strongly)[20] supervenes on another, say if the chemical supervenes on the physical, then objects which possess some chemical property F necessarily possess some corresponding physical property G, and this G is such that any object possessing G necessarily possesses F. In other words, each chemical property is always accompanied by some physical property, and moreover, this accompanying physical property is always accompanied by the chemical property in question.

A prominent worry about the utility of supervenience in interlevel metaphysics concerns an apparent *lack of precision* involved in supervenience claims. Specifically, it is suggested that the bare assurance that one domain supervenes on another leaves many details of the relationship between the two domains unsettled.[21] One of the most pressing examples of this lack of precision, touched on by Yablo and developed in detail by Wilson,[22] is that the assurance that the non-physical supervenes on the physical is too weak to guarantee that the domain of the physical is *causally closed*, as many physicalists would like to think. In other words, supervenience-based formulations of physicalism appear unable to require causal closure.

How could it be that the physical is not causally closed, yet the non-physical supervenes on the physical? Wilson provides one detailed story of how this might come about:

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[20] Kim's paper distinguishes two forms of supervenience, *weak* and *strong*; we can gloss over such variants here.
[21] See for example (Yablo 1992, pp. 256-257, fn. 29), (Wilson 1999, p. 33), and (Fine 2001, pp. 10-11).
[22] See (Yablo 1992, pp. 256-257, fn. 29), (Wilson 1999, pp. 40-41), and (Wilson 2005, pp. 431-433).

"Certain structures composed wholly of physical entities have properties emergent from their necessitating physically acceptable properties. Commonly, emergent properties are understood as having or bestowing causal powers grounded in "configurational" forces or interactions that are as metaphysically and scientifically basic as the fundamental physical forces and interactions. When emergent properties are instanced in a particular, the operative forces are a combination of physical and configurational forces, and the particular thereby has causal powers going beyond those due just to the operative physical forces." (Wilson 2005, p. 430)

On this account, the physical is not causally closed because there are strongly emergent higher-level properties with their own distinctive causal powers that are absent from the domain of the physical. Yet, the non-physical supervenes on the physical, because these higher-level properties are the necessary *result* of configurational forces that are operative when certain physical states obtain.

So, Wilson proposes the *condition on causal powers* as a metaphysical criterion which, unlike supervenience-based criteria, is capable of distinguishing between causal closure physicalism and strong emergentism:

"*Condition on causal powers* (CCP): Each individual causal power associated with a supervenient property is numerically identical with a causal power associated with its base property." (Wilson 1999, p. 42)

Causal closure physicalism satisfies the CCP; strong emergentism does not, because it has supervenient properties which possess causal powers lacked by their base properties. Moreover, the configurational forces in Wilson's strong emergentist account seem to yield *hyperintensional relations*, albeit non-primitive ones. Configurational forces necessitate the co-occurrence of emergent and base properties, making the pair necessary equivalents. The configurational forces also create an asymmetry between the two properties, by giving the emergent property a causal power lacked by the base property. The result is a hyperintensional relation, as witness the following hyperintensional sentence positions: "Physical property G is governed by a configurational force which necessitates, and bestows a novel causal power upon, chemical property F". However, unlike grounding, this is not a *primitive* hyperintensional relation, and if it is understood as a *thin* hyperintensional relation (as described in §2.3; Fine's sentence-relata grounding was argued to be an example in §3a.3), it need not commit one to a hyperintensional metaphysical relation between worldly relata.

Wilson also suggests a version of nonreductive physicalism, in which properties' associated sets of causal powers are what determines whether a supervenient property is distinct from its base property: if the supervenient property's causal power set is a *proper subset* of the base property's causal power set, then it is distinct (Ibid., p. 45). This is a concrete way for nonreductive physicalists to fill in the claim that supervenient properties are "distinct from, but determined by, their base physical properties".

Wilson's account of nonreductive physicalism is noteworthy because it is an account of interlevel metaphysics which seems able to completely avoid any commitment to hyperintensional relations, in contrast with grounding accounts and Wilson's strong emergentist account. Because, so long as the laws of nature which bestow causal powers are metaphysically contingent (a familiar and plausible view), the causal powers subset relation which asymmetrically holds between higher-level and lower-level entities does not constitute a difference between (metaphysically) necessary equivalents. So, for example, the following sentence does *not* involve hyperintensional sentence positions: "Chemical property F is a causal power subset

of <u>physical property G</u>".[23] This is because F and G are not necessary equivalents; under different possible laws of nature, F might obtain in the absence of G; it might obtain all by itself, or it might obtain as a causal power subset of some property H whose causal powers are defined by alternative physical laws.

This illustrates an important point: not only are there viable non-grounding accounts of interlevel metaphysics, there are even viable accounts of interlevel metaphysics which avoid hyperintensional relations of any sort (at least if one is willing to incur a theoretical commitment to contingent laws of nature). So, although grounding and its use in interlevel metaphysics is one of the most prominent examples of hyperintensionality in metaphysics, there are good alternative accounts of interlevel metaphysics which do not involve hyperintensionality. Until such accounts are ruled out, it is far from clear that hyperintensional concepts are needed to *adequately characterize* interlevel metaphysics, so by Nolan's criteria for metaphysical hyperintensionality (§2.1), it is still an open question whether interlevel metaphysics "is hyperintensional".

4a. Essence

Essence is a very old topic in philosophy; here, I will just aim to capture the contemporary approach to the subject. The story goes something like this: an object has properties, but some of those properties are more important to that object than others. Objects bear certain of their properties *essentially*, in contrast with the properties which they bear *non-essentially*, or *accidentally*. What characteristics distinguish essential possession from accidental possession? Roughly: given some particular object, the properties which are bound up in *what it is to be* that object are its *essential properties*, and the properties which the object might lack while still *being the object that it is* are its *accidental properties*. As a plausible example, being the offspring of my biological parents might be essential to me,[24] but my fondness for cats might be accidental. This section will consider the ways in which hyperintensionality is involved in this general approach to essence.

The starting point for the contemporary literature on essence is (Fine 1994), a paper which argued that modal accounts of essence are inadequate for capturing the level of detail needed to properly understand essence. In what has become a well-known example, Fine argued that Socrates and the singleton set containing Socrates differ when it comes to essence, even though the two are necessary equivalents (in the sense that Socrates' singleton set necessarily exists if Socrates exists and vice versa). Intuitively, it seems that it is essential to Socrates' singleton set that it contain Socrates, but that it is not essential to Socrates that he be contained in his singleton set (Ibid., pp. 4-5).

This amounts to a hyperintensional difference, as witness the following underlined sentence position: "<u>Socrates' singleton set</u> is essentially such that Socrates is contained in his singleton set". Contrast with the

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[23] Until now, I have been cautiously speaking of causal subsets *associated with* properties, rather than *identifying* properties with sets of causal powers; see (Wilson 1999, p. 41). For this example, I have opted to switch over to identifying properties with sets of causal powers, to show that the argument works without the controversial haecceitistic assumption that different laws might bestow *completely* different sets of causal powers on one and the same property.

[24] As Kripke puts it: "How could a person originating from different parents, form a totally different sperm and egg, be *this very woman*?" (Kripke 1980, p. 113)

plausibly false sentence: "Socrates is essentially such that Socrates is contained in his singleton set".[25] What sort of "hyperintensional thing" might this sentence position be evidence of? Following the analysis in §3b.1 of fundamentality, we can say that "being essentially such that *x*" is a *hyperintensional property*, because the object it is being attributed to is in the hyperintensional sentence position. However, this case is more complex than the case of fundamentality because here, we can take *any* property, "being such that *x*" and consider its corresponding essential attribution, "being essentially such that *x*", to obtain a *hyperintensional property* (unless the property at issue is essentially possessed by *everything*).

4a.1. Objectual and Generic Essence

An important question about essence is whether it is *objects* or *types of objects* that can bear properties essentially. To make this concern vivid, the following example will show how attributing essential possession to *objects* rather than *types of objects* can prove troublesome in at least some cases. I have a Nalgene water bottle on my desk, and Nalgene water bottles are widely known for being near-unbreakable. Now, suppose that (surprisingly) my water bottle *did* break, and I repaired it to a usable but fragile state. In that case, the water bottle would no longer possess the property of near-unbreakability, and yet it still seems to be the same water bottle that it was before; this suggests that near-unbreakability was not an essential property of the water bottle. However, we might still want to say that near-unbreakability is essential to *Nalgenes*. In that case, we would only be committed to the more plausible claim that my water bottle is no longer a Nalgene, that it is a "defunct" or "former" Nalgene in the same way that the shell of a car in a scrap yard is no longer really a car, or in the same way that a pressed penny from a souvenir machine is no longer really a penny.

Recently, (Correia 2006) has argued that Finean accounts of essence must be modified to better accommodate such a distinction between *objectual essence* (pertaining to objects) and *generic essence* (pertaining to types of objects). Specifically, Correia uses the following example to argue that it will not suffice to simply analyze generic essence as cases where all objects of a kind necessarily share some objectual essence:

> "Plausibly, bachelors, as such, are essentially unmarried. But many actual men are bachelors and fail to be essentially unmarried." (Ibid., p. 759)

A straightforward alternative account which can accommodate this example treats generic essence as a special case of objectual essence in which *properties* (like *being a bachelor*) are the objects which bear some property essentially. On this view, we would end up with hyperintensional sentence positions like the following: "Being a bachelor is essentially such that being a bachelor is being an unmarried man". As with Fine's account, these sentence positions are suggestive of *hyperintensional properties* such as "being essentially such that being a bachelor is being an unmarried man", although here these are properties *of* other properties.

However, Correia rejects this view on the basis that such a view requires an ontological commitment to properties, that some paradoxical predicates which seem to have essential characteristics cannot express properties, and that the property-centric view would result in an inappropriate dependence of objects on

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[25] Note that the "is such that *x*" way of stating a property is used since more natural phrasings like "Socrates is essentially contained in his singleton set" do not grammatically allow us to substitute "Socrates' singleton set" in for "Socrates", as is required of a witness hyperintensional sentence position.

properties (Ibid., pp. 760-763). Instead, Correia suggests that objectual and generic essence are to be taken as independent primitives. This account involves primitively true attributions of generic essence of the form "It is true in virtue of <u>what it is to *be a bachelor*</u>, that bachelors are unmarried men" (Ibid., pp. 764-766).

Notice that the underlined position in the preceding sentence may be hyperintensional, as witness the plausibly false sentence: "It is true in virtue of <u>what it is to *be an unmarried man*</u>, that bachelors are unmarried men". These are suggestive of *hyperintensional properties* of the form "being that in virtue of which bachelors are unmarried men", yet Correia denies any commitment to properties. Correia's insistence that these attributions are all about *predicates*, rather than *properties*, suggests that the hyperintensional sentence positions involved in his account are to be taken as involving **thin hyperintensional properties**, formally analogous to the hyperintensional properties we have observed so far, but thin in the ontologically agnostic sense discussed in §2.3. In other words, one might say that while many applications of hyperintensionality in metaphysics involve *de re* attributions of hyperintensionality to worldly things, Correia's favored account of essence involves only *de dicto* attributions of hyperintensionality to linguistic entities, namely predicates.

4b. Distinctions Between Types of Properties

The previous section addressed one example of what we might call a *distinction between types of properties*: essential versus accidental.[26] But the essential/accidental distinction is just one example of a broader phenomenon. §4b.1 will consider another such distinction which Eddon has recently argued is hyperintensional: the intrinsic/extrinsic distinction. Then, §4b.2 will discuss Hoffmann-Kolss's more general argument that many distinctions between types of properties may be hyperintensional.

4b.1. The Hyperintensionality of the Intrinsic vs Extrinsic Distinction

The distinction between intrinsic and extrinsic properties is quite easy to motivate for non-philosophers. An intrinsic property is all about the object that possesses it; an extrinsic property involves an object's relation to other things. Tiny the cat is furry: intrinsic. Tiny the cat is ten feet away from me: extrinsic. It would be more abstruse and philosophical to deny these claims than to accept them. Further, there is a natural and intuitive way of characterizing intrinsic properties in general terms. As Yablo breezily puts it:

> "*You* know what an intrinsic property is: it's a property that a thing has (or lacks) regardless of what may be going on outside of itself." (Yablo 1999, p. 479, emph Yablo's)

This intuitive account has a flaw; as Yablo points out, it counts every property as extrinsic. Because, Tiny is not furry unless the rest of the world is *accompanied by something furry*, and the same world-sensitivity will occur for any property of any object. An apparent fix is to stipulate that intrinsicality is a matter of independence from the *intrinsic* character of the rest of the world, but this would be circular. (Ibid., p. 479)

A straightforward alternative which avoids this circularity is offered by Kim, building off of earlier work on the subject from Chisolm (Kim 1982, pp. 59-60). Technical details aside, the basic idea as summarized

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[26] Perhaps in the case of essence it would be more accurate (if a bit more stilted) to speak of a distinction between types of property possessions, for one and the same property may be essentially possessed by one thing but accidentally possessed by another. This may not be the case for the other distinctions between types of properties we will discuss.

by Lewis is that a property is intrinsic if it could be possessed by a *lonely* object, that is, an object that does not coexist with any wholly distinct contingent object (Lewis 1983a). However, Lewis argues against this account by pointing out that *loneliness* is itself an intrinsic property on this account, but intuitively, loneliness is an extrinsic property since it turns on the presence or absence of a "rest of the world".

The alternative proposed in (Lewis 1983b) has become a canonical account of intrinsicality. Said account, like the others just mentioned, is a modal (thus intensional) theory. Eddon summarizes it like so:

> "A property *P* is *intrinsic iff* for any two possible duplicates, either both have *P* or both lack it. Lewis then analyzes duplication in terms of natural properties: two objects are *duplicates iff* they share all their perfectly natural properties, and their parts can be put into correspondence in such a way that corresponding parts have the same perfectly natural properties, and stand in the same perfectly natural relations." (Eddon 2011, p. 316)

Eddon argues against this view, and further claims that any viable account of intrinsicality must individuate properties hyperintensionally, i.e., must deny that "properties that are cointensive—have the same instances across possible worlds—are identical" (Ibid., pp. 318). For concreteness, let's consider an apparent pair of distinct cointensive properties employed in Eddon's argument:

> "When one is familiar with the device of identifying properties with sets of possibilia, and realizes that *being me* is cointensive with a purely descriptive property like *having such-and-such features and so-and-so relations to other things*, then it is easy to slip into thinking that *being me* is intuitively extrinsic. But once we step back from this metaphysically loaded picture, the belief is hard to maintain. Intuitively, *being me* is intrinsic: it's a property I have purely in virtue of myself alone, and not in virtue of anything else." (Ibid., p. 329)

So, the story goes like this: on traditional intensional accounts of properties, a property is individuated by the set of possible things that possess it. The apparently intrinsic property *being me* is only possessed by me. And, the apparently extrinsic property *having such-and-such features and so-and-so relations to other things*, which amounts to a big conjunction of intrinsic and extrinsic properties that only I possess all of, is also only possessed by me. So, the set of possible things that possess the apparently intrinsic property *being me*, namely the singleton set containing me, is the same as the set of possible things that possess the apparently extrinsic property *having such-and-such features and so-and-so relations to other things*. Thus, traditional intensional accounts of properties would count these as one and the same property. Yet, as Eddon puts it, these properties "fall on different sides of the intrinsic/extrinsic divide", which suggests they are non-identical. (Ibid., p. 334)

If, following Eddon, we decide against giving up our intrinsic/extrinsic intuitions in cases like this, then we end up with hyperintensional sentence positions like the following: "*Being me* is an intrinsic property". (Compare to the false sentence: "*Having such-and-such features and so-and-so relations to other things* is an intrinsic property".) This suggests that intrinsicness and extrinsicness are *hyperintensional properties* of properties, which we might call hyperintensional *second-order properties*, in contrast with *first-order properties* which are properties of things that are not properties.[27]

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[27] Notice the similarity to the second-to-last account mentioned in §4a.1, which held that generic essence attributions are to be understood as hyperintensional properties of properties!

Hyperintensional second-order properties offer insight on the situation with essential and accidental property possessions discussed in §4a. There, hyperintensional sentence positions were presented which suggested that properties of the form "being essentially such that *x*" are hyperintensional. Now, we can explain this recipe by viewing essentiality and accidentality as hyperintensional second-order properties, which can be attached to ordinary first-order properties to produce hyperintensional ones.[28]

There is one loose end to cover: the observation that intrinsicness and extrinsicness are hyperintensional second-order properties sidesteps Eddon's claim that *properties* in general are to be individuated hyperintensionally. Said claim can be motivated by noting that on this account, *hyperintensional differences* obtain among properties. Recall from §2.3 that a hyperintensional difference is a difference that obtains between necessary equivalents, or necessarily equivalent expressions. Granting the presupposition that properties are not to be explained away in nominalist or antirealist terms, we are here dealing with *necessary equivalents*, namely cointensive properties. So, we are left with two choices: either *being me* and *having such-and-such features and so-and-so relations to other things* are identical properties, or they are two different properties. If they are identical properties, then we must either reject our intrinsic/extrinsic intuitions or scramble for some way to explain away the horrible claim we are apparently committed to, namely that all sorts of properties are both intrinsic and extrinsic. Otherwise, we need to accept that we are dealing with two cointensive properties that are distinct. But these properties are necessarily equivalent, so how are they to be individuated if not by the hyperintensional differences that obtain between them?

4b.2. The Hyperintensionality of Distinctions Between Types of Properties in General

So far, we have seen arguments that the essential/accidental and intrinsic/extrinsic distinctions involve hyperintensionality in some form or another. Now, let's turn to (Hoffmann-Kolss 2015) for a general proposal on what it takes to establish the hyperintensionality of *any* "X/Y distinction" among properties.

To begin, here is Hoffman-Kolss's characterization of (the relevant form of) hyperintensionality:

> "An X/Y distinction is *hyperintensional* iff there are cointensional properties P and Q, such that P is an X-property and Q is a Y-property" (Ibid., p. 337)

As expected, Eddon's idea that there are cointensional properties such that one is intrinsic and the other is extrinsic is an example of a hyperintensional X/Y distinction on this account. Hoffmann-Kolss notes that although Eddon focused on the intrinsic/extrinsic distinction, her argument actually applies to a broader range of distinctions, *if* one accepts the Lewisian assumption that individuals are worldbound. (Ibid., p. 341)

Hoffmann-Kolss then goes on to defend a pair of premises which do not rely on a worldboundness assumption, such that any X/Y distinction which satisfies them is hyperintensional (Ibid., p. 344):

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[28] The analogous recipe, "being intrinsically such that *x*", looks a bit more awkward, because it is unclear that the intrinsicality of a property can vary based on what object bears it as with essence. Plausibly, this can happen in at least some cases; for instance, it might be extrinsic to my left glasses lens that it is next to the other one, but the obtaining of that same relation might be intrinsic to my glasses as a whole. However, such cases are probably rarer than they are with the essential/accidental distinction, narrowing the range of cases where the recipe yields a hyperintensional property. Because, if property *x* is always intrinsic, "being intrinsically such that *x*" is not assured to be hyperintensional.

Premise 1: All identity properties are X-properties.

Premise 2: There are instantiable universally essential Y-properties.

The technical details of the argument establishing the sufficiency of these premises is beyond the scope of this review paper. What is important for our purposes here is that if the argument goes through, there are many diverse X/Y distinctions which can be argued to be hyperintensional through these premises, including: qualitative/non-qualitative, natural/less-than-perfectly-natural, relational/non-relational, biological/non-biological, and dispositional/categorical (Ibid., pp. 345-348). For any X/Y distinction where such an argument goes through, we can draw conclusions concerning hyperintensionality which are analogous to the ones concerning intrinsic/extrinsic discussed in §4b.1.

5. Counterpossible Conditionals, Impossible Worlds, and Hyperintensional Propositions

As discussed in §2, necessity plays a central role in characterizing hyperintensionality. As such, the preceding discussion has freely invoked modal notions like necessity and possibility in order to get a grip on things. However, there are competing views on how modality is to be understood, and different answers to this question have the potential to impact postmodal and hyperintensional issues.

In particular, there are two longstanding frameworks for theorizing about modality: the *possible worlds* view, and the *structured propositions* view. Analogously, there have been attempts to understand postmodal or hyperintensional issues in metaphysics via *impossible worlds* and *hyperintensional propositions*.

First, §5.1 will review the discussion in (Bernstein 2016a) of counterpossible conditionals, which provide a concrete motivation for impossible worlds. Then, §5.2 will consider the accounts of impossible worlds considered in (Jago 2015), and §5.3 will contrast impossible worlds with the alternative framework of hyperintensional propositions also suggested in (Jago 2015).

5.1. Counterpossibles

Counterfactuals are subjunctive conditionals of the form, "if *c* hadn't occurred, *e* wouldn't have occurred" (Bernstein 2016a, p. 2).[29] A counterfactual is additionally a *counterpossible* if its antecedent *c* is impossible. And finally, a *causal* counterpossible is a counterpossible with causal content; Bernstein argues that causal counterpossibles always take the form, "If *x* hadn't failed to *y*, *z* wouldn't have occurred" (Ibid.). As an entertaining example, Bernstein has us consider an utterance from a mathematician who had hoped to win the Fields medal: "If only I hadn't failed to prove that $2 + 2 = 5$, that medal wouldn't have gone to my rival!" (Ibid.). Statements of this sort seem to make sense, and Bernstein's claim is that the proper analysis of such statements involves impossible events that occur in impossible worlds.

The key idea is that the antecedents of causal counterpossibles are always *omissions*, that is, events that do not occur, and that we should analyze causal counterpossibles via a theory of omissions extended to handle impossible omissions. For Bernstein, an omission is "a tripartite metaphysical entity composed of

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[29] Note that it is also common to allow statements like "if *c* hadn't occurred, *e* would still have happened" to count as counterfactual conditionals. But nothing here will turn on how one prefers to draw this terminological line.

an actual event, a possible event, and a contextually specified counterpart relation between them" (Ibid., pp. 3-4). An example helps to make this vivid:

> "Suppose that while I should have been watering your plant, I was instead singing karaoke. The omission is composed of my singing karaoke (the actual event), my watering your plant (the possible event), and a contextually specified counterpart relation between them." (Ibid., p. 4)

An impossible omission is just an omission "whose nonactual component occurs at a metaphysically impossible world" (Ibid.); once this has been established, the analysis of counterpossibles proceeds very similarly to the analysis of omissive counterfactuals in general. So, counterpossibles represent one case where impossible worlds might help to achieve methodological desiderata such as theoretical unity.

5.2. Impossible Worlds

But what *are* impossible worlds? This question is weighed in (Jago 2015), which considers the traditional alternatives for understanding worlds suggested in (Lewis 1986), in the context of impossible worlds.

The main question is whether to adopt a *genuine* or *ersatz* conception of impossible worlds. A genuine account, in line with Lewis's modal realist view about possible worlds, seems difficult to accept; how could there be a real world in which, for instance, there is a hedgehog that is simultaneously spiky and not spiky all over (Jago 2015, p. 6)? Instead, Jago suggests that we adopt an ersatz account of impossible worlds, on which they are "mere representations that such-and-such is the case". (Ibid.)

Jago specifically recommends a unified *linguistic* ersatz account of possible and impossible worlds, as opposed to a *pictorial* ersatz account, due to the increased fine-grainedness of the former account (Ibid., p. 7). It is suggested that this linguistic ersatz account should involve a *Lagadonian language*, in which "particulars, properties, and relations themselves serve as names and predicates" (Ibid., p. 8).[30] On such an account, the only difference between possible and impossible worlds is that the description of an impossible world involves some impossible combination of objects and properties.

It might seem obvious that such impossible worlds are hyperintensional; an impossible worlds account seems to allow for more fine-grained distinctions, and that is one of the main roles of hyperintensionality. However, it is not immediately clear how impossible worlds involve distinctions between necessarily equivalent things, so it is worth coming up with a hyperintensional sentence position to get more concrete. This can be achieved by considering *H*, the set of impossible worlds which fail to be possible *only* because they allow for (simultaneously all over) spiky-and-not-spiky hedgehogs: "In *H*, there are spiky-and-not-spiky hedgehogs". Contrast this with the false sentence: "In *H*, there are furry-and-not-furry cats".[31]

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[30] Jago also expresses an openness to a perhaps more familiar account in which these items are taken to be the *referents* of names and predicates. (Ibid.)

[31] Spiky-and-non-spiky hedgehogs and furry-and-not-furry cats are necessary equivalents because both are impossible, so it is vacuously true that necessarily, neither one can exist without the other; necessarily, neither one can exist at all!

5.3. Hyperintensional Propositions

Jago observes that his proposed account of impossible worlds is reminiscent of structured Russellian propositions, due to its reliance on a Lagadonian language which takes worldly items like objects and properties to be the constituent units of ersatz-world-building sentences (Ibid., pp. 8-9). More specifically, Jago argues for the following commonalities between his sets-of-linguistic-ersatz-worlds view and the alternative structured propositions view: they must share the same logical structure, have isomorphic logically atomic sentences, and be equal in fine-grainedness (Ibid., pp. 9-10). In light of all this, we can characterize Jago's proposed hyperintensional propositions simply as propositions of a Lagadonian language as used in his suggested account of impossible worlds, which happen to not make up an entire world.[32]

Jago further suggests that in light of the deep similarities between hyperintensional structured propositions and impossible worlds (understood in a linguistic ersatz manner), the two accounts are inter-definable and more or less equivalent as semantic frameworks (Ibid., p. 11).[33]

6. Explanation and the Merely Representational

The beginning of this paper (§1, §2) discussed the distinction between *representational* and *metaphysical* hyperintensionality, and noted that the metaphysical status of a hyperintensional phenomenon is not always easy to determine. Since then, we have seen some couple examples of notably austere applications of hyperintensionality in metaphysics, such as how for Fine grounding is a *thin hyperintensional relation* (§3a.3), and for Correia generic essence predicates are *thin hyperintensional properties* (§4a.1).

Such examples illustrate how a theory can be difficult to categorize as metaphysical or representational. Accounts rooted in linguistic entities like sentences and predicates seem straightforwardly representational; yet, when they are used to supply answers to questions of realism and reduction,[34] or the essence of types of things out in the world,[35] they appear more metaphysical.

Explanation is a topic where this interplay takes center stage. On one hand, explanation seems to be all about our *understanding* of the world; what we believe, which models we reason with, how we make reliable predictions: representational. On the other hand, it is natural to say that we explain worldly *things*, and that the goal in doing so is to give a correct description of what a thing is like: metaphysical.[36] §6.1 will consider the role of explanation in metaphysics, and discuss how different views on explanation shape this role.

Another matter concerning the relationship between metaphysics and representation is the question of when two metaphysical theories are *equivalent*. §6.2 will discuss the account given in (Miller 2017) of the difference between truly distinct theories, and apparent alternatives produced by our representations.

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[32] And this will depend on our preferred criterion of what constitutes an entire world.

[33] Note that Jago does break this symmetry to an extent, arguing that there is a special metaphysical significance to the sets-of-worlds account (Ibid., pp. 13-16).

[34] As in (Fine 2001).

[35] As in (Correia 2006).

[36] As Taylor puts it, "Those who hold that explanation is an entirely metaphysical phenomenon that obtains between facts abandon the subjectivity of explanation, while those who hold that explanation is merely a matter of inducing a kind of illumination on a subject come close to abandoning its objectivity." (Taylor 2020, p. 5)

6.1. Explanatory Realism, Backing Models, and Metaphysical Methodology

There is a two way relationship between explanation and metaphysics. In one direction, there are claims that a metaphysical phenomenon in some way allows for, contributes to, or constitutes explanation; we saw one example of this earlier (§3a.1) in the claim that the metaphysical grounding relation is explanatory. In the other direction, (Taylor 2020, pp. 1-2) notes that metaphysical claims are often defended by appeal to facts about the presence or absence of explanations; grounding theorists have argued for grounding by appeal to the existence of non-causal explanations, and dualists and strong emergentists have argued for those views by appeal to the unavailability of explanations about the relationship between two domains.

Because of how frequently explanation is employed in metaphysical arguments, a wide variety of issues in metaphysics may be impacted by one's theory of explanation. One popular view, which naturally lends itself to appeals to explanation in metaphysics, is *explanatory realism*, the view that all explanation works by identifying whatever metaphysically determines the thing being explained (Taylor 2018, p. 2). Against this view, Taylor argues that such a theory fails to accommodate the diversity of the many different varieties of explanation that we use. A number of types of explanation, namely analogical explanation, rule-based explanation, reductio ad absurdum explanation, and statistical explanation, do not seem to obviously track any sort of metaphysical structure (Ibid., pp. 8-19).

Even if there is not any guaranteed connection between explanation and metaphysical structure, it is still an independent question whether we must also abandon a *backing model* of explanation, in which explanations must be backed by supporting relations of some (potentially non-metaphysical) variety:

> "According to backing models of explanation, explanation must be backed by a relation that is not itself explanation, but that is capable of supporting explanation, and we explain by giving information about these backing relations." (Taylor 2020, p. 3)

To give a concrete example of a plausible case of non-metaphysical backing, we can look to explanations which are backed by relations of conceptual dependence:

> "Some explanations give information about conceptual dependence. For example, I can explain why all bachelors are unmarried by pointing out that it is part of the *definition* of the concept "bachelor" that a bachelor must be unmarried. This is true as a matter of linguistic convention, and so does not involve the worldly, mind-independent form of dependence that the RB [realist backing] model requires for explanation." (Ibid., pp. 7-8)

If we keep a backing model of explanation, but drop the explanatory realist view that the supporting relations must be metaphysical, the question of what role explanation may play in metaphysical theorizing will turn on the specifics of the non-realist backing model that we adopt. At the extreme, anti-realist backing models which reject any sort of "worldly" or "reality-tracking" backing relations may leave explanation with little to no purpose in metaphysical argumentation.[37] However, more moderate accounts are available, such as the non-realist backing model given in (Taylor 2020), which holds that the objective aspect of explanation

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[37] "If full-blown explanatory anti-realism is true, then there is at best a limited role for explanation in metaphysics." (Ibid., p. 14)

is given by a connection to *truth* (rather than *metaphysical structure*) (Ibid., p. 14). This account is perfectly compatible with the idea that some backing relations might be metaphysical.

If we adopt a moderate non-realist backing model for explanation which allows for both metaphysical and non-metaphysical backers, then the presence or absence of an explanation may still be used to argue for a metaphysical conclusion, *if* it can further be argued that type of explanation in question involves metaphysical backers (Ibid., pp. 17-18). This blocks easy moves such as the argument that there must be metaphysical grounding relations because there are non-causal explanations; on non-realist backing models, such arguments must be supplemented with an argument that the relevant backers are to be understood via some metaphysical theory. As Taylor notes, this can be viewed as a specific framework in which inference to the best explanation style arguments are employed; multiple theories of the relevant backing relations can be judged by how well they back explanations concerning a given subject matter. (Ibid., pp. 18-19)

This has similarities with Nolan's *adequate characterizability* standard, on which a phenomenon may be counted as hyperintensional if there are no good ways of adequately characterizing the phenomenon in question without hyperintensional sentence positions. Nolan's standard is for establishing the hyperintensionality of phenomena which are understood to be metaphysical, but Taylor's account suggests a roughly similar approach for establishing that a phenomenon is *metaphysical*: a phenomenon may be counted as metaphysical if there are types of explanations concerning said phenomenon for which proper backing relations cannot be supplied without accepting some metaphysical commitment.[38]

6.2. Metaphysical Theory Equivalence

Closely related to the question of whether a phenomenon is metaphysical or not is the question of whether two apparently conflicting metaphysical theories of some phenomenon are really at odds. Coarse-grained accounts of the "logical space" in which metaphysical theories are situated risk papering over differences between truly distinct views, by mistakenly characterizing the putative differences between them as the result of verbal disputes, conceptual confusions, or something similar. However, we cannot simply take claims of theory distinctness at face value, since verbal disputes and the like have been known to happen (and to not always be obvious when they do happen). Accordingly, the hyperintensional account given in (Miller 2017) of theory equivalence allows for a greater fine-grainedness than purely modal accounts, while leaving room to rule out supposedly distinct theories as mere artifacts of our linguistic representations.

Miller's account centers on a distinction between *strong* and *weak* hyperintensions, which are meant to track the difference between "genuinely worldly distinctions" and apparent differences which are "entirely the product of our representational systems" (Ibid., p. 3). Miller's central idea is that two theories are metaphysically distinct if they are *strongly hyperintensionally equivalent*.

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[38] This is at least a sufficient condition for a phenomenon to be metaphysical, but it might not be a necessary condition because there could be ways to establish that a phenomenon is metaphysical which do not involve explanation. If, however, it turns out that any metaphysical phenomenon must have certain types of explanations which require some metaphysical commitment (as seems plausible), then the condition is necessary.

It is interesting to note Miller's reliance on the notion of the *hyperintension* of an expression. Philosophers frequently speak of the *extension* or *intension* of an expression, but it is less common to see talk of hyperintensions as such, even in papers that explicitly focus on hyperintensionality. Miller suggests that just as intensions are often viewed as functions from possible worlds to extensions (e.g., the intension of *red* would be a function from each possible world to the set of all the red objects in that world), strong hyperintensions may be viewed as functions from possible and impossible worlds to extensions (Ibid., p. 10). So, for instance, the hyperintension of *red* would be a function from each possible and impossible world to the sets of all the red objects in each of those worlds, and unlike in the case of intensions, these sets might include things such as objects that are both red and not red all over, or red square circles.

What hyperintensions are like will turn on which account of impossible worlds is adopted. Miller opts for an ersatz account involving Lagadonian world-building sentences similar to Jago's approach described in §5.2, but cautions that the details of such an account must be worked out in a way that does not result in each English (or other natural language) sentence having a distinct strong hyperintension, or else all metaphysical theories will count as distinct. (Ibid., pp. 13-14)

We might then ask what *is* going on in cases where two English sentences share a strong hyperintension, that is, what their apparent distinctness consists of and why it is not metaphysical. Miller addresses this with the notion of weak hyperintensions: functions from possible worlds, impossible worlds, and *fabulae* to extensions (Ibid., p. 16). *Fabulae* are meant to roughly capture "how a non-ideal agent would take things to actually be", and they are specifically taken to be "sets of sentences to which a non-ideal agent would be disposed to assent, conditional on taking some impossibility to actually obtain" (Ibid., pp. 17-18).[39] Such sets of sentences are even finer-grained than impossible worlds, because two different framings of the same impossible world might result in an agent assenting to disparate sets of sentences. (Ibid.)

7. Discussion

This paper has reviewed various applications of hyperintensionality in metaphysics. Hopefully, it has achieved its goal of establishing the diversity of such applications; beyond the familiar cases of grounding and essence, hyperintensionality is involved in non-grounding approaches to fundamentality and interlevel metaphysics, in a potentially wide variety of distinctions between types of properties (intrinsic/extrinsic, dispositional/categorical, natural/non-natural, and more), and also in counterpossible conditionals.

In each of these cases, hyperintensional theories have been proposed which do a better job than other leading theories of avoiding prejudging against apparently live hypotheses concerning the phenomenon in question (as Fine emphasizes regarding essence[40]), as well as of matching up with the intuitive facts about

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[39] In an amusing example, Miller notes that if she came to falsely believe that the four-color theorem is false, "I would be disposed to go and buy extra paint were I to be in the map-making business", and moreover, that "by contrast, if I came to believe that $2 + 2 = 5$, I would not be disposed to go out and buy more paint were I to be making maps, or otherwise." (Ibid., p. 18)

[40] "[An account of essence] should not settle, as a matter of definition, any issue which we are inclined to regard as a matter of substance." (Fine 1994, p. 5)

the phenomenon in question (as Eddon emphasizes regarding the intrinsic/extrinsic distinction[41]). These are compelling reasons to accept hyperintensional accounts of these phenomena.

This seems to suggest that theorists who are skeptical of hyperintensionality in metaphysics are left with two undesirable options: give up (or at least make exceptions to) their skepticism, or bite the relevant bullets in cases where non-hyperintensional accounts of various phenomena lack some theoretical virtue enjoyed by theories which make use of hyperintensional language. However, I will suggest that there is a third option for such skeptics: rather than deny the hyperintensionality of phenomena which are effectively characterized by hyperintensional theories, they can argue for a "less metaphysical" account of the phenomenon in question, that is, an austere or thin account such as some form of nominalism or anti-realism.

The most natural starting point for such an approach are the thin accounts of Fine and Correia discussed earlier (§3a.3, §4a.1). For instance, in §3a.3 we saw that Ney holds that Fine's account benefits from its neutrality on matters of ontology and realism, and Taylor has observed that Fine's language-centric version of grounding may not constitute a realist backing model of the sort endorsed by explanatory realists:

> "There is logical space for a view of grounding as obtaining between propositions, and of explanation as obtaining between propositions. However, such views appear to stretch the idea that grounding is a form of distinctively metaphysical determination… …the closer an account of grounding gets to accommodating these cases, the further it gets from a realist backing model." (Taylor 2020, p. 9)

Then there is Correia's account of generic and objectual essence, which explicitly incorporates *predicates* but not worldly *properties*, illustrating a way for the skeptic of hyperintensionality in metaphysics to argue for more austere accounts of all sorts of hyperintensional distinctions between "attributes" (to pick a neutral term). Such a predicate-based account could plausibly be developed for the intrinsic/extrinsic distinction, the dispositional/categorical distinction, and many others. With such an account in hand, the skeptic could then characterize the referents of relevant predicates in a variety of ways which might undermine their "metaphysical status", for instance by arguing that they are not fundamental, that they are not mind-independent, that talk of them does not correspond to objective facts, or what have you.

Or, one could simply accept a language-centric account of dependence relations, or attributes, or perhaps other things like counterpossible conditionals, and abstain from taking up any view on the nature of the referents (if any) of the key terms used to describe the phenomenon in question. This approach allows one to avoid any commitment to metaphysical hyperintensionality, without having to eschew the theoretical benefits that hyperintensional language has to offer, such as fine-grainedness.

In conclusion, there are a variety of approaches to hyperintensional theorizing in metaphysics which allow more austere theorists to avoid commitments to things like worldly hyperintensionally distinguished properties and primitive hyperintensional grounding relations. Additionally, there are diverse examples of

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[41] "*Prima facie*, this acknowledgement [that *being me* seems intrinsic, *having such-and-such features and so-and-so relations to other things* seems extrinsic, yet the two properties correspond to the same set of individuals] suggests that our intuitive notion of intrinsicality is sensitive to hyperintensional differences among properties. If this is so, then no account of intrinsicality that is unable to accommodate the relevant hyperintensional differences will be unable to accommodate our intuitive beliefs." (Eddon 2011, p. 333)

new theories with clear theoretical virtues that have been made possible by hyperintensional language. So, checking to see if a hyperintensional approach might cast light on some topic of study can be worthwhile regardless of one's general theoretical preferences.[42]

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