Quality and Quantifiers

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April 2017 draft

Abstract

I examine three "anti-object" metaphysical views: *nihilism*—there are no objects at all—*generalism*—reality is ultimately qualitative, and *anti-quantificationalism*—quantification over objects does not perspicuously represent the world. After setting aside nihilism, I argue that generalists should be anti-quantificationalists. Along the way I attempt to articulate what a "metaphysically perspicuous" language might even be.

1   Nihilism

Philosophers defend some radical-sounding views. Some say there are no gods. Some say there are no numbers. Some say there are no unobservable things. Some say there are no things composed of parts. And some make an even more sweeping negative existential claim: there are no particular individuals at all—just a pattern of qualitative properties and relations. Let's think about that last sort of view. (It isn't a view I believe, but even so it's a view worth thinking about. Thinking about extreme philosophical views can be a good heuristic method for getting clear on the issues in debates over their tamer relatives.)

A variety of defenses have been offered for this view, from the Principle of Sufficient Reason, Occam's razor, and the interpretation of fundamental physics (e.g. Pooley ms; Morganti 2008; Dasgupta 2009; Ladyman and Ross 2009; see also O'Leary-Hawthorne and Cortens 1995). I'm not going to take up any of those motivations here, but let's pretend that for one reason or another we are convinced. What might an adequate theory in this spirit be like?

People who think there are no gods typically don't practice theistic religion. You might expect similarly that people who thought that there were no numbers would

be uninterested in mathematics, and that people who thought that there were no unobservable things would be heedless about radiation poisoning, and that people who thought there were no individual people would be radically detached from particular human concerns. But that's not what most advocates of these views are like. Instead, they offer some kind of reconstruction of our usual mathematical, scientific, or individualistic discourses: an explanation for why talking the way we do is still worthwhile, despite falling short of strict and literal truth.

Likewise, someone who says that the world consists in a pattern of qualitative properties and relations without particular individuals is still going to say something about what we are up to when we say things like "Obama is a president" or "There are more people in China than there are in the Western Hemisphere." Even the revisionary metaphysician should grant that these claims have more going for them than "Obama is a fish". Somehow we need to make sense of the difference. One nice way of doing this is by giving systematic paraphrases: a general way of translating statements that seem to be about particular individuals into statements in some preferred metaphysical idiom. Let's say, as a simple stand-in, that somebody offers to paraphrase "There are electrons"—which looks like a statement committed to particular things, namely electrons—with "Electronhood is instantiated"—which looks (at least superficially) like a statement only committed to a qualitative *property*, namely electronhood.

When philosophers talk out of both sides of their mouth like this, it isn't clear how seriously we should take their radical-sounding claims. Suppose for the sake of argument that the metaphysical story used to paraphrase our ordinary language is right. And suppose these paraphrases really do a good job of making sense of how we deploy ordinary statements that are superficially about individuals: generally speaking we only say "There are electrons" when in fact electronhood is instantiated, and so on, so the use conditions of ordinary sentences systematically match the circumstances in which their metaphysical paraphrases obtain. Given these assumptions, a plausible (though not inevitable) view is that the *truth condition* for the ordinary statement "There are electrons" is just that electronhood is instantiated. But if that's right, and electronhood *is* instantiated, then when you say "There are electrons" you are saying something true—and if you deny that by saying "There are no electrons", you would be saying something false. But the philosophical claim "There are no particular individuals" sounds like it would have the ordinary claim "There are no electrons" as a consequence. If it does, then it too is false. And if it doesn't, then it is misleading, since it doesn't have the ordinary consequences it sounds like it would have. Whether it is false or misleading, it isn't a good way of putting the metaphysical idea.

This is a familiar sort of argument (compare Alston 1958; Turner 2011), and there are different ways of reacting to it. But for present purposes let's just back off from the initial radical-sounding claim, that there are no particular individuals. Instead, we'll look for an alternative way of putting the core metaphysical idea: the idea that the world consists in its pattern of qualitative properties and relations.

I'll consider two different ways of doing this. The first idea, in a slogan, is that all facts are general, rather than particular. The second idea, in a slogan, is that quantification over individual objects does not perspicuously represent the facts. These are less radical-sounding views than the one we started with—and they are both unfortunately clouded with a certain amount of obscurity—but they are still worthy of our consideration. After articulating both ideas, I'll argue that they are more tightly connected than one might think.

2   Generalism

The first idea is that reality is ultimately qualitative, rather than particular. I'll call this view **Generalism** (though the view goes by several other labels, such as "qualitativism", or "anti-individualism" or "structuralism").[1] It takes some work to make this idea clear. The formulation I'll investigate says that *all determinate matters of fact are qualitative*. To make sense of this, two notions need to be clarified—though I won't give anything like an analysis of either of them.

First, "qualitative": the idea is that a qualitative proposition does not say anything specifically about any particular individual. At a first pass:

> We might try to capture the idea by saying that a property is purely qualitative—a suchness—if and only if it could be expressed, in a language sufficiently rich, without the aid of such referential devices as proper names, proper adjectives and verbs (such as 'Leibnizian' and 'pegasizes'), indexical expressions, and referential uses of definite descriptions (Adams 1979, 7)

But (as Adams notes) our syntax is an imperfect guide. A syntactically general sentence may fail to express something qualitative, if it uses a non-qualitative predicate like "Leibnizian"—and we have no precise account of which predicates are really qualitative. Conversely, a syntactically singular expression, which contains names or free variables, may still succeed at expressing something qualitative—for

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[1] See for instance Adams (1979); Fine (2005); O'Leary-Hawthorne and Cover (1996); Ladyman and Ross (2009); Dasgupta (2009); Dasgupta (2014); Dasgupta (2016); Turner (forthcoming); Kment (2012, 578ff.); J. S. Russell (2013). Of course these terms are also sometimes used with other meanings.

instance, if it expresses just the same thing as some general sentence. Maybe, as some predicates are really singular, some names are really qualitative: for example, there might be a qualitative property of Deity, necessarily had uniquely by God, such that the syntactically singular statement "God loves" expresses the qualitative proposition that some Deity loves. Or the syntactically singular statement "∅ = ∅" might just express the qualitative proposition that some set has no members. Officially, then, rather than giving an account in other terms I'm just treating "it is qualitative whether …" as a primitive sentence operator—and hoping that you can get at basically what I mean. (I intend quantification over *propositions* as a shorthand for generalization in sentence position.)

The generalist idea is that singular claims do not "correspond to reality"—in a sense which is also hard to explain in other terms (see Field 1994; Fine 2001; J. S. Russell 2013, sec. 5). For example, a standard thing people say about what special relativity teaches us is that it is "meaningless" to say that two separated events are absolutely simultaneous. This isn't to say that such a claim is gibberish. Indeed, it may be intelligible and useful—perhaps as a placeholder in reasoning. The problem is rather that it doesn't succeed in describing a way for the world to be. One might say "There is no such thing as absolute simultaneity"—in a somewhat elusive sense which isn't supposed to trivially follow from property-nominalism, or be trivially ruled out by a deflationary view of property-quantification. Being absolutely simultaneous is not a genuine way for things to be related to one another. For another example: many philosophers and mathematicians have said that "it doesn't make sense to ask" whether 2 is an element of 7. Of course the question can be posed using meaningful words put together grammatically. The point is rather that it is asking about a kind of structure that numbers simply don't have. To express these claims, I'll use a sentence operator "it is determinate whether …". For instance, we can give voice to these views about space-time and numbers by saying that, for space-like separated x and y, it is indeterminate whether x and y are absolutely simultaneous, and that it is indeterminate whether 2 is an element of 7.

Some say that the way in which "2 is an element of 7" is defective is just that it is false.[2] This is not a rival to the view under consideration, because indeterminacy is not an *alternative* to ordinary truth or falsity. Saying "it is indeterminate whether A" takes no stand on whether A. It is compatible with A, and it is compatible with not-A. Indeed, in what follows I am taking classical logic for granted (at least as a working assumption), including the law of excluded middle, A-or-not-A. So, if it is

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[2]See Magidor (2013 especially chapter 4); thanks to Ross Cameron for discussion of this point. Note that I am using "true" and "false" in *thin* senses: by ⌜it's true that A⌝ I just mean A, and by ⌜it's false that A⌝ I just mean not-A. This is to be contrasted with being *determinately* true or *determinately* false.

indeterminate whether A:

>   (1) Either A and it is indeterminate whether A, or else not-A and it is indeterminate whether not-A.

In other words, either A is both indeterminate and true, or else not-A is. (Of course A is not *determinately* true, and neither is not-A. We must be careful to distinguish ordinary truth from determinate truth.) Similarly, either not-A is both indeterminate and false, or else A is. So there are propositions which are both indeterminate and true, and propositions which are both indeterminate and false.[3]

The idea of indeterminacy is not that "2 is an element of 7" is alethically gappy. Rather, the idea is that, even if as it happens "2 is an element of 7" is false, and "2 is not an element of 7" true (and then is "7 is disjoint from {2}" true because 7 and {2} have no common elements, or false because 7 is not a set?—we are neutral on these questions) this is not because there is some "substantive" numerical set theory to be discovered. The truth or falsity of these claims doesn't come from the elementhood structure of numbers. If it comes from anything, it is the absence of such structure.

The generalist's view is that "it doesn't make sense to ask" questions about particular individuals apart from their qualitative features: though the questions may be intelligible, reality does not have the right kind of structure for them to have determinate answers. I haven't really explained what this sort of indeterminacy is any more than I have explained what qualitativeness is, but again I hope I have pointed to it clearly enough that we more or less know what we are talking about. I also hope we'll get some additional clarity on the notion as we try to apply it. Accordingly, I'll take generalism to be this view:

Generalism. If it is determinate whether A, then it is qualitative whether A.

For this schematic generalization to have its proper force, we should allow quantification into its instances. For instance,

>   (2) For each a, if it is determinate whether a has mass, then it is qualitative whether a has mass.

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[3]It may be helpful to note the parallels with supervaluationist treatments of vagueness (see Fine 1975; Keefe 2000). Unfortunately, some confusion arises from the fact that some supervaluationists use the word "true" (or "True") for *determinate* truth, rather than ordinary "thin" truth.

I raised the possibility that there may be exceptional cases where a superficially singular statement might turn out to really be qualitative. It may be really a qualitative matter whether ∅ has mass—and thus even the generalist might accept that this is a determinate matter. But in any case which is not like that—for any a for which the claim that a has mass is genuinely singular, and not a disguised generalization—the generalist holds that it is not determinate whether a has mass. (I'll return to this point in Section 4.)

I should point out that I am not thinking of "determinate" as synonymous with "fundamental", in the sense of not being *grounded* in anything further. The thesis I am calling Generalism is different from the thesis of **Ground Generalism**, which says that all non-qualitative facts are derivatively grounded in qualitative facts (Dasgupta 2016).[4] Here is one way in which they are different: it is usually taken that conjunctions are grounded in their conjuncts. In contrast, I take it that if it's determinate whether A and it's determinate whether B, then it is also determinate whether A-and-B. So conjunctions can be determinate, but not fundamental. Similarly, I take it that even if Generalism is true, there may well be determinate *generalizations*: but it is often thought that generalizations are grounded in their instances, and thus not fundamental. (I'll return to this point in Section 4.) The generalist thesis that I am discussing is neutral on grounding questions.

3   Quantifiers

The nihilist, who thinks that there aren't any individuals, clearly has serious work to do to come up with an adequate description of the world: our "off-the-shelf" theories of what the world is like are full of commitments to particulars—electrons or people or sense-data or something or other. Such theories require radical revision—and philosophers have offered interesting proposals for how to go about it, such as theories of how qualitative properties can be "bundled" or "placed" (see van Cleve 1985; O'Leary-Hawthorne and Cortens 1995; Hawthorne and Sider 2002; Paul 2002; Dasgupta 2009, sec. 3).

The generalist, though, has backed off of the radical claim that there aren't any individuals, and says instead that there aren't any genuine facts about any particular one of them. It isn't obvious that "off-the-shelf" theories won't be fit for the generalist's purpose. First-order existential claims don't straightforwardly contradict generalism, the way they contradict nihilism. According to the generalist, a theory expressed using standard first-order quantification may well be *true*; so what need is there for exotic property-bundling or feature-placing theories?

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[4]I discuss the prospects for Ground Generalism in .

O'Leary-Hawthorne and Cortens (1995) suggest that the problem with familiar quantificational theories might not be a deficit of *truth*, but rather of some other philosophical virtue:

> It is not important that the ontological nihilist assent to the claim 'Strictly speaking, there are no objects.' What is crucial instead is that the ontological nihilist insist that object talk and the concept of an object have no place in a perspicuous account of reality (p. 157).

This amounts to a second way of retreating from the sweeping negative existential: individual quantification does not perspicuously represent the world. The idea is not that individualistic talk fails to describe genuine facts, but rather that it inadequately reflects the structure of those facts. Our ordinary way of putting things may be true—indeed, determinately true—but even so it distorts the way the world really is. This would not be a problem with *what* is said, but with *how* it is said.

It will be helpful to explore how things go with a tractable artificial language: first-order predicate logic PL (without names, and understanding each predicate symbol as standing for some specific qualitative property or relation). The idea we are here considering is that this language has a certain defect:

Anti-Quantificationalism. PL is not perspicuous.

Perspicuity is a feature of language, rather than what that language says. The very same thing can be said either perspicuously or unperpicuously. An *Atlantic* article reads, "2015 was the best year in history for the average human being to be alive" (Kenny 2015; the example is a variant of O'Leary-Hawthorne and Cortens 1995, 155). This sentence may say the very same thing that another sentence says more perspicuously (and prosaically)—for example, maybe "In 2015, the total quality of life divided by the total population was greater than the total quality of life divided by the total population for any previous year." (Or maybe this doesn't go far enough, since it reifies "the total quality of life".) In this way the notion of perspicuous representation contrasts with the notion of determinacy I discussed in the previous section: if sentences A and B say the same thing, then I take ⌜It's determinate whether A⌝ and ⌜It's determinate whether B⌝ to say the same thing as well. (Syntactically, "it's determinate whether" is a sentence operator, while "perspicuous" is a predicate of linguistic expressions.)

Metaphysicians often engage in the project of recasting various claims in more perspicuous terms, but it is a bit obscure what this project really amounts to. One proposal comes from the logical atomists: the world consists of facts with "genuine

objective complexity" so "there is a possibility of cutting up a fact into component parts" (B. Russell 2009, 24 and 19; cf. O'Leary-Hawthorne and Cortens 1995, 155). Moreover, "in a logically correct symbolism there will always be a certain fundamental identity of structure between a fact and the symbol for it" (p. 24). According to this proposal, a perspicuous (or as Russell puts it, "logically correct") sentence is one whose syntactic structure matches the component-structure of the fact to which it corresponds. For example, Russell held that most sentences involving ordinary proper names are not perspicuous:

> The word "Picadilly" will form part of many significant propositions, but the facts themselves corresponding to these propositions do not contain any single constituent, whether simple or complex, corresponding to the word "Picadilly". That is to say, if you take language as your guide in your analysis of the fact expressed, you will be led astray in a statement of that sort. (2009, 17).

Anti-Quantificationalism could be understood analogously as saying that the facts corresponding by quantificational sentences do not have constituents corresponding to individual quantifiers.

Sider (2011) defends another proposal: his account of "structure" does not depend on an ontology of structured facts, but rather an account of a "fundamental language."[5] According to Sider (developing a proposal from Lewis 1983) *being an electron* "carves nature at the joints", whereas *being a smile* or *being grue* (while perhaps having determinate extensions) fail to carve nature at the joints. He also extends this to syntactic categories other than predicates, such as quantifiers and connectives. Sider proposes that these distinctions be articulated using an all-purpose, syntactically polymorphic operator $\mathcal{S}$. With this operator, one can make pronouncements like $\mathcal{S}\exists$ and $\neg\mathcal{S}$ grue and even $\mathcal{S}\mathcal{S}$ (2011, sec. 7.13). One way of understanding the question of whether a quantificational language is perspicuous is in Sider's terms: "whether quantificational notions like 'there exists' carve at the joints" (sec. 1.3; see also sec. 9.2).

Russell-style atomism and Sider-style joint-carving are both ways of explicating criteria for a perspicuous language, but I don't intend the notion to be tied to these more specific visions: I'm thinking of things more abstractly and holistically. I'll

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[5]It's worth noting that it isn't obvious that Russell is any more committed than Sider to an ontology of facts, since according to Russell "you cannot properly name a fact" or put one "in the position of a logical subject" (see pp. 13-14). This is connected to Russell's theory of types: in modern terminology, we'd say that facts are not eligible values of first-order variables. (Rather, commitment to facts involves quantification of type *t*.) By the common Quinean standard, then, facts are not included in Russell's "ontology" proper.

think of perspicuity not as a feature of individual syntactic constituents (as Sider does), nor as a feature of single sentences (as Russell does), but rather as a feature of an entire language. (But this does not preclude explaining defectiveness of the whole language in terms of defectiveness of particular expressions within it.) I also won't be assuming something that seems to be built into both Russell and Sider's visions, which is that for *two* languages to both be simultaneously perspicuous, they would have to be structurally isomorphic. Perhaps there are many radically different ways of perspicuously representing the world.

Rayo (2013) critically discusses a closely related view he calls "metaphysicalism":

> A metaphysicalist believes that in order for an atomic sentence to be true, there needs to be a certain kind of correspondence between the logical form of a sentence (i.e. its semantically operative lower-level syntactic structure) and the metaphysical structure of reality (i.e. the metaphysically privileged carving of reality into constituent parts). (p. 6)

Perspicuity aligns with Rayo's notion of correspondence between form and metaphysical structure. But I should stress that Anti-Quantificationalism does not commit one to metaphysicalism: it is emphatically not part of the view that object-talk is all *untrue*. It fails to be completely successful at representing the world, but this failure is more like being obfuscating than it is like being wrong.[6]

4   Quantifier Generalism

As I noted above, since generalism does not imply that standard quantificational theories are untrue, generalists need not (as such) renounce those standard theories and pursue more exotic alternatives, like property-bundling or feature-placing metaphysics. But anti-quantificationalists do have a reason to take up this quest—not as a search for truth rather than error, but as a search for metaphysical clarity rather than obscurity.

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[6]Rayo's "moderate metaphysicalism" is maybe a bit closer in spirit: "the constraint that there be a correspondence between logical form and metaphysical structure applies only to assertions made by philosophers in the 'ontology room'." (Rayo 2013, 11) But—like Russell and Sider, I think—I am not thinking of perspicuity as a condition on speaking truly on any occasions, even special philosophical ones.

Similarly, unlike metaphysicalism, Anti-Quantificationalism does not bar one from accepting certain "just is" sentences that Rayo is friendly to—such as "for the number of dinosaurs to be zero just is for there to be no dinosaurs" (p. 3, also p. 7). Even if "there are no dinosaurs" is *more perspicuous* than "the number of dinosaurs is zero", this difference between the two expressions does not require any difference in what they express.

In the remainder of this essay, I will present an argument that generalists should be anti-quantificationalists—and so they should take interest in the prospects of these metaphysical projects after all. That is, I will argue against **Quantifier Generalism**, which combines Generalism with the thesis that first-order predicate logic PL is perspicuous.[7]

Dasgupta briefly discusses an argument against the view that the fundamental (that is, ungrounded) facts are quantificational.

> For suppose she proposes that all individualistic facts are grounded in facts expressible in PL. The trouble is that it is not clear what this could mean. For it is arguably analytic of the existential quantifier that existentially quantified facts are grounded in their instances. Indeed, this understanding of the quantifier is arguably implicit in the standard Tarskian semantics for PL. So if we are now being told, say, that the fact that $(\exists x)Fx$ is fundamental, I need to be re-taught how to interpret PL. Which parts of '$(\exists x)Fx$' are referential? Which are predicational? Or does it have some other structure altogether? (Dasgupta 2011, 21)

I find it a bit hard to see the force of this argument as it stands, since I am not convinced that it is analytic "that existentially quantified facts are grounded in their instances." True, many theorists do accept this grounding claim, but as Donaldson (2014, sec. 6.2) argues, a commitment to Ground Generalism would be a very good reason to revise this grounding theory. And it is not clear why revising this grounding theory would require us to also provide a new way of understanding existential quantification—since it is not clear that a grounding theory played any role in our understanding of existential quantification in the first place, even implicitly. (Many of us are much less sure of our understanding of grounding than we are of our understanding of predicate logic!) This does not refute Dasgupta's argument, but more needs to be said before the argument can be properly evaluated.

I won't be taking up the task of trying to work out Dasgupta's argument: the argument I'll present against Quantifier Generalism has nothing to do with analyticity or ground. But it is in a very similar spirit: it also turns on the idea that there are singular commitments "implicit in the standard Tarskian semantics for PL".

This argument will deploy the following premise. For any electron, whether it has mass is a matter of what *it* is like—a way a particular electron is.

(3) For each electron, it is not qualitative whether it has mass.

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[7]Turner (forthcoming) uses this label for a slightly different view in the same spirit, which is framed in terms of "fundamental facts" rather than perspicuous language.

This premise strikes me as a reasonable starting place. But it has met with enough resistance that I'd better say something to clarify and defend it.[8]

A non-qualitative matter is a matter of what some particular individual is like. Remember, we have set aside the nihilist view that there are no particular individuals. The generalist maintains that there are particular individuals—and electrons are among them. For any electron, the question of whether it has mass is, on its face, a question about what that particular electron is like. In Section 2, though, I considered the possibility that some *superficially* singular statements might turn out to describe purely qualitative matters—for instance, claims about God or pure sets. Some generalists might think that this happens pervasively. For example, a bundle theorist might think that the fact that a certain electron a has mass just is the qualitative fact that massiveness is bundled together with electronhood and certain other qualitative properties. According to this kind of view, the pronoun "it" in "it has mass" (or the free variable a in "a has mass") is a mere syntactic artifact. For any electron, the question of whether it has mass is not *really* the question of what any particular thing is like, despite the appearances.

But we have also set this kind of view aside: the *quantifier generalist* disavows this kind of redescription. According to the quantifier generalist, "some electron has mass" (or rather its PL formalization, "for some a, a is an electron and a has mass") is perfectly perspicuous as it stands. When we speak perspicuously, we put off our syntactic disguises. If PL is thoroughly perspicuous, then for any electron, the question of whether it has mass is really as it appears—a question about what a particular thing is like.[9]

It might seem puzzling for a generalist to agree to this. After all, for any electron, if it is really non-qualitative whether it has mass, then according to generalism there is no determinate fact of the matter whether it has mass.

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[8]Thanks to two anonymous referees for pressing this.

[9]An alternative argument for (22) turns on the possibility of qualitative indiscernibles, though there is no space here to spell it out in detail. In brief: Black (1952) argued that there could be two qualitatively indiscernible spheres; Adams (1979) argued that either one of these spheres could have been spontaneously destroyed. If that much is right, then if a is the surviving sphere, it is not a qualitative matter that a survives: for all the qualitative facts would have been the same if the other sphere survived instead. (If Goodman (manuscript) is right, then this claim must be qualified—but not in a way that I think matters for the argument.) One may well wonder whether the generalist should accept these possibilities. Some bundle theorists, for example, reject Black's case as misdescribed (e.g. O'Leary-Hawthorne 1995). But as it happens many generalists *do* accept the relevant possibilities of qualitative symmetry and symmetry-breaking. (See O'Leary-Hawthorne and Cover 1996, 11–12; Saunders 2003, sec. 2; Pooley 2006, 17–18; Dasgupta 2009, sec. 2; Pooley ms, secs. 2.2–2.3; Dasgupta 2014, 23.) For further discussion see .

(4) For each electron *a*, it is not determinate whether *a* has mass.

But it isn't as if the generalist wants to get out of the business of ascribing massiveness to electrons! The generalist is perfectly happy to accept the determinacy of *generalizations*:

(5) It is determinate that some electron has mass.

Claims (4) and (5) might sound like they conflict—but they don't really. By analogy, consider a sorites series of colored tiles smoothly varying from red to blue. The *supervaluationist* standardly says that it is determinate that some tile is the last red one; but even so, there is no tile which is *determinately* the very last red one (e.g. Keefe 2000, 185). Formally, this is exactly analogous to the generalist's position.

Combining (4) and (5) is a feature, not a bug. This is exactly the spirit of generalism: the view is that there is nothing defective about generalizations, but there is something defective about their instances.

Even so, this does point toward a problem for *quantificationalism*. The argument has two steps. The first step is to articulate a success condition for the project of perspicuous representation. I hope this will contribute toward explicating what "perspicuous" even means, by putting some substantive constraints on the notion (while still not requiring anything as fine-grained as Sider's version of structure). The second step is to show that the standard first-order language PL, as it is usually understood, does not meet this success condition by the quantifier generalist's lights. The argument is not decisive (we are groping through some pretty dark spaces, I'm afraid) but I think we learn something interesting from it.

5 Compositionality

The first idea is that if the world can be adequately characterized using certain sentences, then it should be possible to say what it takes for each sentence to be true, where each truth condition is a matter of determinate fact in the sense I indicated in Section 2. This would be a way of explicitly spelling out how these claims "correspond to reality", as opposed to doing some other less metaphysically loaded job. For instance, even claims about absolute simultaneity might be intelligible and useful as placeholders in reasoning. Doing something else, like outlining an expression's inferential role, might suffice to account for its intelligibility, but that does not explain *what it says* in the sense of giving its truth-conditions.

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Let me make clear that I am not setting an especially high bar here. For instance, if "Every electron has mass" is part of your metaphysical theory, then stating that sentence's truth condition does not require you to state it in other terms. The terms of your metaphysical theory itself are fine. It is fine to say,

(6) What it takes for "every electron has mass" to be true is for every electron to have mass

This grammatical construction is a bit cumbersome, but I want to get at something stronger than mere material equivalence. Let's use "$A := B$" to abbreviate "what it takes for A is B" (with the appropriate infinitival transformation applied). This is specifically a device for articulating truth conditions (and, eventually, other semantic conditions, like reference conditions or satisfaction conditions). It isn't really a more basic way of illuminating what truth conditions are. Indeed, that's hard to do—for instance, truth conditions can't be adequately stated using mere material biconditionals, or necessary biconditionals. But I hope you already know what truth conditions are. This is a device for stating them. (Compare Rayo 2007; 2008; 2013; Williams 2012.)

Here is a principle about how I intend this locution to be understood: if B is what it takes for A, then there is really something which is what it takes for A: A corresponds to a genuine way for the world to be, some genuine aspect of the world's structure—namely B. That is, I am understanding this to be a constraint on the kind of truth-conditions we are interested in giving for our metaphysical theories:

Determinacy. If $A := B$, then it is determinate whether B.

One of the features a metaphysical language should have is that each of its sentences corresponds to a genuine determinate matter of fact, and the sentence itself is a perfectly adequate way of stating what that factual condition is.

So the first condition (not the last) on a perspicuous metaphysical language is that it should have disquotational, determinate truth conditions. For each sentence φ in the language,

(7) $\ulcorner$"φ" is true $:= \varphi\urcorner$

should be true. (Each instance of (7) is a sentence in an extension of the "metaphysical" language L, enriched with devices for specifying the semantics of L: namely,

quotational resources for describing the syntactic structure of *L*-expressions, truth and satisfaction predicates for *L*, and the "what it takes" connective ≔.)

So far there is nothing stopping the quantifier generalist from meeting this condition. The truth conditions for a first-order language *L* could go like this:

(8) "Every electron has mass" is true ≔ every electron has mass
(9) "Some electron has charge" is true ≔ some electron has charge
(10) "Every electron has mass and some electron has charge" is true ≔ every electron has mass and some electron has charge

And so on—infinitely many such statements. So far, so good.

There is a second condition a perspicuous language should meet. For all I have said so far, there may be no systematic relationship at all between (10) and any other conjunction—no systematic contribution of "and" to the truth conditions of the language. Rather than merely listing all of the conjunctions and stating their truth conditions separately, we would like to state a single general clause that covers all conjunctions in one fell swoop—like this one:

(11) For any sentences φ and ψ, if (φ is true ≔ A) and (ψ is true ≔ B), then $\ulcorner \varphi$ and $\psi \urcorner$ is true ≔ A and B

Using this compositional principle, together with the disquotational principles (8) and (9), we can derive (10) as a consequence—along with the truth conditions for infinitely many other conjunctions. This seems better than treating each conjunction's truth conditions as a basic postulate itself. The further constraint I am proposing for a perspicuous language is that its truth theory should be derivable compositionally. There should be some small set of "structural" principles like (11), corresponding to the syntactic connectives of the language, which jointly imply disquotational truth conditions for the whole language. This provides a sense in which, not only does each sentence express a genuine fact about the world, but also the *structure* of these sentences gets something right.

This picture contrasts with Rayo's account of the role of compositional truth theories.

> A language involving object-talk—that is, a language including singular terms and quantifiers binding singular-term-positions—is attractive because it enables one to give a recursive specification of truth-conditions for a class of sentences rich in expressive power. But there is not much more to be said on

its behalf. In setting forth a language, we want the ability to express a suitably rich range of *truth-conditions*. If we happen to carry out this aim by bringing in singular terms, it is because they supply a convenient way of specifying the right range of truth-conditions, not because they have some further virtue (2013, 16, original emphasis).

Rayo's picture is that semantics for expressions below the level of the complete sentence—for instance, terms or open formulas—are a merely instrumental part of the system whose purpose is specifying truth-conditions for *sentences*. There is no distinctive virtue in expressing certain truth-conditions in a language with one syntactic structure rather than another. In contrast, the proposal here is that there is a further virtue to be claimed for the right sort of language: a perspicuous language doesn't merely express appropriate truth-conditions, but rather it does so in such a way that its significant component parts also correspond to determinate features of reality. (I hope that this point will become clearer in the next section.)

6   (I Can't Get No) Satisfaction

On to step two of the argument. The trouble with quantifier generalism is that quantificational sentences have constituents—variables and open formulas—which don't "correspond to reality" by the generalist's lights. The difficulty emerges when we look closely at the simple compositional truth theory for quantified sentences: it appeals to interpretations of open formulas that involve singular facts. So quantificational sentences, so interpreted, are not perspicuous by the generalist's lights. I'll try to make this more precise now.

Tarski (1944) provided what is nowadays the standard compositional theory of quantificational language. The main idea is to detour through *satisfaction conditions* for open formulas. To work out the truth condition for the sentence "Every electron has mass", we first work out the satisfaction condition for the open formula "x is an electron and x has mass". This is some condition A such that

(12) For each a (a satisfies "x is an electron and x has mass" := $A(a)$.)

Given the satisfaction condition A, we can then determine the truth condition:

(13) "Every electron has mass" is true := for each a, $A(a)$.

To tell the whole story, we also need a compositional theory of satisfaction conditions—of what it takes, in general, for things to satisfy any given open formula. Here's how this normally goes. (For simplicity I'll focus on formulas of just one variable.)

(14) For each a (a satisfies "x has mass" := a has mass)

(15) If for each a (a satisfies φ := $A(a)$) and for each a (a satisfies ψ := $B(a)$), then for each a (a satisfies $\ulcorner \varphi$ and $\psi \urcorner$:= $A(a)$ and $B(a)$)

(16) If for each a (a satisfies φ := $A(a)$), then for each a (a satisfies $\ulcorner$for some x, $\varphi \urcorner$:= for some b, $A(b)$)

And so on for the rest of the familiar clauses. Finally for sentences, with no free variables, we say

(17) If for each a (a satisfies φ := $A(a)$), then φ is true := for any a, $A(a)$.

(Don't confuse this kind of disquotational truth theory with a different thing we also learned from Tarski: a *model theory* for PL. A PL-model M is a certain set—the *domain* of M—together with certain pairings of predicates with subsets of the domain—their *extensions* in M. And we can interpret PL in a model using similar clauses to the truth theory I'm describing. The interpretation rules deliver conclusions like:

(18) "Electrons have mass" is true-in-M iff some element of the M-domain is in the M-extension of "electron" and also in the M-extension of "mass".

But we are not concerned here with domains, or what it takes to be true in some model—we are concerned with what it takes for quantificational sentences to be true *simpliciter*. Mere model theory may be completely irrelevant to this.)

This Tarskian truth theory is very nice. But quantifier generalists cannot accept it.

The problem is not that this truth theory quantifies over individuals. The generalist is happy to do that: having backed off from the claim that there aren't any individuals, the generalist holds that general sentences of PL express genuine facts—and those sentences quantify over individuals. There is no obvious reason why the truth conditions for these sentences should not also quantify over individuals. That is just what the quantifier generalist should expect.

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The trouble is rather that the truth theory quantifies into semantic conditions, in the account of satisfaction. This effectively commits the theory to singular facts—which the generalist rejects. For each particular thing a, the semantic theory says what it takes for a to satisfy φ. For instance, it includes "atomic" clauses like (14): for each thing, what it takes for that thing to satisfy "x has mass" is for it to have mass. But according to the quantifier generalist, for some things a there is nothing which it *is* for a to have mass. If it is not a qualitative matter whether a has mass—and I argued in Section 4 that there are cases where it is not—then by generalist lights this is not a determinate matter of fact. The generalist holds that in such cases "a has mass" is "meaningless" in the sense that it corresponds to no genuine way for the world to be. This means that the satisfaction clause involves something similarly "meaningless". But that means it fails to be the sort of condition that we sought, since it violates Determinacy: if $A := B$, then it is determinate whether B.

Putting all this together, we can see that the following principles are inconsistent:

(19) For each a (a satisfies "x has mass" $:=$ a has mass).

(20) For each a, if (a satisfies "x has mass $:=$ a has mass), then it is determinate whether a has mass.

(21) For each a if it is determinate whether a has mass, then it is qualitative whether a has mass.

(22) For some a, it is not qualitative whether a has mass.

Here (19) is part of the Tarskian truth theory, (20) is an instance of Determinacy, (21) is an instance of Generalism, and I defended (22) in Section 4. So the Tarskian truth theory is not acceptable to the generalist: its characterization of the truth conditions for determinate sentences relies on indeterminate satisfaction conditions for open formulas.

It's important here to distinguish claims like these:

(23) For some a, it is determinate whether a has mass.
(24) It is determinate whether for some a, a has mass.

There is nothing problematic for the generalist about (24), which says there is a certain general fact. But (23) says there is a singular fact, which the generalist cannot accept. The trouble is that the Tarskian semantics doesn't just involve general claims about what it is for a formula φ to be satisfied by something or other—it involves

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claims about *which* particular things satisfy φ. This is crucial to the account's compositionality. For instance, which things satisfy $\ulcorner\varphi$ and $\psi\urcorner$ is determined by which things satisfy φ and which things satisfy ψ. But whether *anything* satisfies $\ulcorner\varphi$ and $\psi\urcorner$ is not determined by whether anything satisfies φ and whether anything satisfies ψ. So if the semantic clauses are adequate, there must be determinate facts about which things satisfy open formulas—and these include non-qualitative facts.

In short, the quantifier generalist needs a compositional account of what general PL sentences say about the world; and the standard Tarskian account is unavailable, because it appeals to singular facts.

7 Alternative Semantics

As I warned, the argument against Quantifier Generalism is not decisive. The Tarskian account (as I have construed it) is, I think, the most straightforward way of specifying the truth conditions for a quantificational language. But it is not the only way. One option for the generalist is to give a different compositional account of the truth-conditions for a first-order language, which does not rely on providing singular satisfaction conditions.

Cian Dorr suggested one alternative approach to me, which I'll call the **Predicate Proposal**. Spelling it out involves modifying the framework at several points. I'll sketch this proposal briefly, since I think it's helpful to see an example of another way things might go, but I won't pursue it in detail here.

Step 1. Enrich our semantic language with *predicate abstraction*. For a formula φ, the expression $\lambda x\,\varphi$ has the syntactic type of a predicate, which can be applied to a term to produce another formula.

Step 2. Allow the "what it takes" connective $\coloneqq$ to join *predicates*, rather than just sentences. We can understand $F \coloneqq G$ as saying "what it takes to F is to G". To make sense of the Determinacy constraint, we'll also need to extend our notion of "determinate fact of the matter" to predicates, rather than just sentences. As certain sentences fail to correspond to determinate ways for reality to be, so also we may think that certain predicates (like "absolutely simultaneous") fail to correspond to determinate ways for things to be. (Is this notion of determinate ways for things to be generalistically acceptable? I think so, but I'm not sure. This is one issue that would need to be explored further to understand the prospects for the Predicate Proposal.) It is also plausible to take Generalism to involve a further commitment regarding qualitative *properties*, and not just qualitative *propositions*: if being F is determinate, then being F is qualitative.

Step 3. Rewrite the problematic atomic satisfaction condition using these new predicate-targeting resources: what it takes to satisfy "x has mass" is to have mass.

(25) $\lambda a\,(a$ satisfies "x has mass") $\coloneqq \lambda a\,(a$ has mass)

In this version, we don't quantify into truth or satisfaction conditions: instead, the variable-binding is done separately on each side of the "what it takes" connective. So applying the Determinacy constraint to (25) doesn't require it to be determinate whether any particular thing has mass: rather, it only requires that having mass be a determinate way for something to be. Since having mass is a *qualitative* way to be, this version doesn't conflict with Generalism.

One issue with this proposal is that it uses expressive resources that are not part of the original metaphysical language—predicate abstraction isn't available in bog-standard first-order logic. It's not clear how bad this is—after all, Tarski's Theorem ensures that we must use *some* proper enrichment of the metaphysical language in order to specify its truth conditions—we at least have to add a truth predicate.[10] But there is something distinctively troubling in this version, because in (25) the additional expressive resources are deployed within the right-hand side of the "what it takes" clause. This makes the view that bog-standard PL is a perfectly adequate way of representing the world's structure look a bit dim, since we are unable to say *what* this language represents about the world's structure without employing a different, more expressive language.

A better approach might be to abandon the claim that bog-standard PL is perspicuous: a language that includes predicate abstraction is a better candidate.[11] The difference is subtle, but this sort of subtlety may turn out to matter when it comes to choosing a fully perspicuous language. By the letter, this is an Anti-Quantificationalist view: standard PL is not perspicuous, though something close to it may be. But while this approach is Anti-Quantificationalist by the letter, it is clearly still in the spirit of Quantifier Generalism. (The generalist who takes this route will also need to modify the Tarskian semantic proposal to provide an account of the semantic conditions for lambda-expressions, which does not again fall prey to the problem of binding into those conditions.)

There are two ways forward for the generalist. One is to pursue this project of finding adequate syntax and semantics for a successor to PL with individual quantifiers.

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[10]Thanks to an anonymous referee for emphasizing this point .

[11]Turner (2011, sec. 3.2) argues that languages that add lambda-abstraction "are just as ontologically guilty as first-order ones". Whether we regiment existential claims in the form $\exists x\,\varphi$ or $\exists(\lambda x\,\varphi)$, they are equally unacceptable to the nihilist. This is plausibly so, but there still may be a difference regarding which expression is part of a perspicuous language acceptable to the generalist.

The other is to abandon individual quantifiers and find some alternative metaphysical language in which to theorize. Either way, there is work to do.

Both options are open and interesting. Indeed, I suspect that the two approaches may converge: the best modified version of a language with quantifiers, and the best version of an alternative language without them, may turn out to be straightforwardly isomorphic to one another. If things turn out that way, the question of whether the language on which they converge is really quantificational may simply be vague. But, as often happens in successful inquiry, the vague question will in that case have led to an important precise discovery: how to perspicuously describe reality.

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