"How Many There Are Isn't"

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Abstract

A world where there exists exactly n concrete things is a *count-determinate* world. The orthodox assumption is that count-determinacy is necessary; if to be is to be the value of a variable and the domain of quantification is enumerable, count-determinacy follows (Schaffer 2009, Van Inwagen 2009; 2002). Against this I argue how many there are can be indeterminate; *count-indeterminacy*, I argue, is metaphysically possible and likely actual- even assuming existence is determinate. Notably, the argument includes rebuttals of Evans' *reductio* against indeterminate identity and the Lewis/Sider 'argument from vagueness'. Count-indeterminacy should therefore be recognized as another basic form of genuine metaphysical indeterminacy, in addition to types recently defend by Barnes (2014; 2013), Williams (2008), and Wilson (2016; 2013)

1. Introduction

Counting requires boundaries: only discrete entities can be counted, and an entity is discrete only if bounded. I'll start with a toy example. Suppose one is looking at five apples. To count them as five each apple must appear bounded, i.e., saliently distinct from its environment. Suppose however the observer requires glasses or corrective lenses to see clearly. Upon removing those glasses the boundaries blur; the apples no longer appear discrete. (Asked anew 'how many apples appear in your visual field?', the honest answer is 'I can't say'.) Even for observers with no need for corrective lenses much the same applies to clouds. From a perspective on the ground clouds can lack discernible boundaries, rendering it unclear where one stops and another begins. Without perceiving precise boundaries, how many clouds there are can appear indeterminate (cf. Williamson 2003, p. 690).

These scenarios show something interesting about *resolution*. If, via a powerful camera or telescope, one zoomed in on or magnified an image of the clouds, the precise boundaries of individual constituent water molecules could, theoretically, be revealed- whilst fuzzy or blurry lines would disappear. This suggests the visual appearance of fuzzy borders is due to

the relatively low-resolution capacity of our visual apparatus; were our eyes able to resolve at a higher resolution—say, at the micro-scale—we would (theoretically) be able to perceive sharply delineated groupings of sharply delineated molecules (or even mereological simples).[1] So with higher-resolution eyes we would not be mislead into thinking the number of clouds was indeterminate in the first place- just as someone wearing glasses isn't misled into thinking there is an indeterminate number of apples.

So what appears vague or imprecise on the surface may really be a matter of poor or low resolution. Other familiar examples abound. A powerful telescope reveals a hitherto blurry galaxy as consisting of (relatively) well-delineated enumerable stars. A mass of organic tissue under a microscope reveals discrete cells with sharp boundaries indiscernible to the naked eye. High-definition (i.e. high-resolution) televisions reveal crisp and sharp borders that low-definition TVs do not. (Imagine trying to count spectators at a broadcasted sporting event. What appears as a background blur on a low-definition TV reappears as discrete—and so enumerable—spectators on a high-definition TV). Generally speaking, of course, the higher the resolution the greater the detail.

I will put this concept to work. Moving forward I will speak of *resolving* vague objects, such as clouds, into precise ones, such as water molecules, and of some objects being (relatively) *low-resolution*, such as clouds, and others being (relatively) high-resolution, such as molecules. I will also speak of resolving *count-indeterminacy*—how many there are being indeterminate—by shifting from low-resolution to high-resolution objects or scenarios.

From here the interesting question is whether one can always or necessarily resolve (away) count-indeterminacy. I say no. As anyone familiar with watching a low-resolution YouTube video on a high-definition big screen TV can attest, enlarging or magnifying a low-

[1] Granted, whether a molecule on or near a boundary is part of a given cloud might still be left open. But this is a conceptual problem, not a visual one. I'll discuss this in more detail shortly.

resolution image or video does not make the picture better. In fact, it makes it worse. Without an underlying high resolution base, such as a large uncompressed file or stream, a fuzzy image will remain fuzzy even upon zooming in or enlarging. So here's the crucial claim. If a superficially count-indeterminate scenario were *low resolution all the way down*, the count-indeterminacy would be irresolvable. After all, zooming in or magnifying resolves only if there is detail that is initially missed- as when not wearing glasses, or when looking at a galaxy with the naked eye. One cannot create precision where there is none, however; looking at a blurry photograph through a microscope does not make the image more precise.

It must be emphasized that this is a phenomenon distinct from linguistic vagueness. Famously, Lewis claims

> The reason it's vague where the outback begins is not that there's this thing, the outback, with imprecise borders; rather there are many things, with different borders, and nobody has been fool enough to try to enforce a choice of one of them as the official referent of the word 'outback' (1986, p. 212).

The outback, for Lewis, is *resolvable*. Its apparently imprecise or indeterminate borders are a matter of "semantic indecision". For there are many different precisely delineated classes of objects, each of which is a candidate referent for the apparently singular term 'the outback'. Each candidate is therefore a possible precisification; speakers have yet to decide (and may not ever bother to decide) which precisely delineated class is picked out by the term. This now-standard account of vagueness (as semantic indecision) is the natural analog of the visual process of resolving just described; if we "zoom in" on a scenario and precisify our terms accordingly, any appearance of indeterminate or fuzzy borders disappears, and count-determinacy is restored. Crucially, though, Lewis presupposes the existence of mereological simples, which are themselves discrete and precisely bounded, and that simples are the elements of the sharply delineated candidate classes. One result: on Lewis' mereological universalism there is a determinate number of composite objects for n simples (that number

being 2^n-1), many of which are referent-candidates for 'the outback'. But is it necessarily the case that the universe ultimately consists of precisely delineated simples? If not, and if instead it were low-resolution all the way down—a scenario I will later explain is importantly different than a so-called 'gunky' scenario—genuinely imprecise or blurry borders might well exist. In which case how many there are could be indeterminate.

So the crucial question is whether such a low-resolution scenario is possible (if not actual), such that count-indeterminacy is possible (if not actual). On the orthodox view it is not: on this view all indeterminacy is ultimately due to epistemic or semantic factors such as finite faculties, imprecise predicates, or to-be-determined conventions. Lewis is one such defender of the orthodoxy: part of his discussion of the outback case includes the claim that "the only intelligible account of vagueness locates it in our thought and language", rather than in the world (ibid.). Similarly, Russell (1923, p. 85), Dummett (1975, p. 111), and Sider (2001, p. 127), among others, claim worldly indeterminacy is unintelligible (cf. Rosen and Smith 2004 and Keil 2013). So not only is the traditional assumption that there is no metaphysical indeterminacy, the assumption is this is necessarily so.

Though some have recently defended genuine metaphysical indeterminacy against this tradition, these arguments have favored indeterminate *existence* or *states of affairs*.[2] In this paper I argue for something different: not only is there genuine metaphysical indeterminacy regarding how many there are, but I also argue this is compatible with *determinate* existence; even if *what* exists exists determinately, I will argue, *how many* exist may not. Count-indeterminacy may therefore be a basic feature of how things *are*, independent of other (putative) forms of indeterminacy.

[2] In particular see Barnes (2014; 2013; 2010a; 2010b), Barnes and Williams (2011), Williams (2008), and Wilson (2016, 2013). See also Eklund (2013; 2011) for commentary and criticism.

Though I will focus on the phenomenon itself, two likely implications are worth mentioning at the outset. One concerns the still-orthodox Fregean understanding of existential quantification in terms of number: on this view for *something* to exist is for *one* thing to exist (Olson 2011, p. 67; Van Inwagen 2009, p. 483).[3] If indeed what exists can be count-indeterminate, however, existence and number can and should be decoupled (see also Goldwater 2017). A second implication concerns the familiar meta-ontological view that ontology aims to produce a list or inventory of what exists, a natural concomitant of which is the list having determinate cardinality (Schaffer 2009, p. 349–50 n2; Van Inwagen 2009; 2002). If what exists may be count-indeterminate, however, there may be no (determinately) numbered list of what there is. So count-indeterminacy may well have revisionary implications for issues of fundamental importance in metaphysics: the nature of existential quantification and the goal of ontology itself.

2. Three kinds of count-indeterminate entities

Before arguing for count-indeterminacy two clarifications are necessary. The first is that in this paper count-(in)determinacy is restricted to concrete entities. One reason is to head off a certain line of argument: that an infinite number of numbers entails an indeterminate number of numbers. I'll say more about the distinction between 'infinite' and 'indeterminate' later, but for now note that even if an infinite number of numbers entails an indeterminate number of numbers, because numbers are abstract this is irrelevant to count-indeterminacy as understood here.

[3] According to Frege "existence is analogous to number", such that "affirmation of existence is in fact nothing but denial of the number ought" (1884/1960, p. 65). After endorsing the claim van Inwagen calls it a central plank of the now-orthodox "neo-Quinean meta-ontology" (2009, p. 483).

The second clarification concerns dialectical neutrality. On the canonical understanding of existential quantification, '∃xFx' not only means that something is F but that at least *one* thing is F; as mentioned the standard (Fregean) view is to understand existence in terms of number (Olson 2011, p. 67; Van Inwagen 2009, p. 483). It is also standard to think of '∃' as ranging over a domain of objects, where a domain is understood as a set-theoretical entity whose elements have determinate cardinality. So understood, however, count-determinacy is effectively a definitional or analytic truth. After all, if '∃xFx' *means* 'one thing is F (at least)', then to say 'something is F but no one thing is F' is analytically false or incoherent. And if a domain of quantification by definition is or includes a determinate number of elements, then to say 'some things exists but no determinate number of things exist' is also analytically false or incoherent. Yet few metaphysicians believe the truth of substantive metaphysical theses should be determined on definitional or analytic grounds. So reading count-determinacy into the very meaning of existential quantification should be rejected, or at the very least, temporarily suspended for dialectical neutrality.[4]

With that said, for the remainder of the paper I will argue that three kinds of entities (may) exhibit count-indeterminacy, the result of which is that any world containing such an entity is a count-indeterminate world. The first category is homogenous stuff. The second is what I'll call 'arbitrarily divisible' entities, a category which includes regions of space and time, some tropes or particularized properties, and complex entities built up from these, such as events, facts, and states of affairs. Also included in this category are physical forces and fields. The third category includes what I'll call 'agent-domain' entities, such as beliefs, actions, and intentions. Naturally each counterexample to count-determinacy would be

[4] Cf. Lowe (2003: 328): "While 'everything is something' is apparently a trivial truth of logic, 'everything is some [one] *thing*' looks more like a substantive metaphysical claim" (original emphasis).

individually sufficient. But redundancy is always a failsafe, and some may find one counterexample more convincing than another. Moreover, that the counterexamples are prevalent and drawn from broad classes should make the case more convincingly were I proposing only a single isolated or recondite counterexample.

3. Homogenous stuff

The first argument proceeds via English grammar, which provides a distinction between count nouns and mass nouns (or, more precisely, count and mass senses of nouns). As the name implies, count nouns take numerical prefixes but mass nouns do not. Thus 'water' is used as a mass noun just in case 'there is some water over there' is well-formed but 'there are four water(s) over there' is not. Other common mass nouns include 'gold', 'mud', and 'matter'. Hence 'some matter is liquid' is well-formed but '5 matter(s) is/are liquid' is not. Similarly, 'there is some matter' and 'some matter exists' are well-formed whereas 'there is/are three matters' and 'three matters exist' are ill-formed.[5]

This linguistic fact is the basis of an argument for count-indeterminacy. Presumably 'there is some matter' and 'some matter exists' are not only well-formed but true. Because 'there is/are n matter(s)' and 'n matters exist' are ill-formed for any number n, however, they are of course not true. Assuming that true sentences have corresponding states of affairs that make or ground their truth, it is plausible that 'there is some matter' and 'some matter exists' are made true by there being some matter, or some matter existing. Assuming that ill-formed sentences lack corresponding states of affairs, however, suggests there is no state of affairs of there being n matters, and no state of affairs of n matters existing. It is therefore

[5] Why the difference? One reason concerns boundaries: stuffs such as water or mud do not appear as discrete solids, but rather as liquids or viscous solids. Hence the use of mass terms. By contrast, one uses count nouns when discrete objects are (perceptually) countable.

plausible that <some matter exists> is a state of affairs whereas <some number of matters exist> is not. But this is just to say that *some* matter can exist without there being *some number of* matter(s) that exist. And if so, there can be *some* matter without there being *some determinate number of* matter(s), in which case matter's existence is compatible with matter's count-indeterminacy. Moreover, note that it is the *determinate* existence of matter that is compatible with its count-indeterminacy. Naturally the same goes for stuff more generally: the determinate existence of stuff is compatible with the count-indeterminacy of stuff.

Now, there is an obvious objection here: because matter consists of discrete and so countable material particles, matter (the stuff) is resolvable. Put another way, perhaps what makes 'some matter exists' true is the existence of discrete material particles rather than count-indeterminate stuff. But modal strength matters here. Even if in the actual world matter or stuff consists of discrete particles, it is implausible to hold this is necessarily the case; it does not seem like a necessary truth, or a truth in every metaphysically possible world, that matter consists of discrete material particles. Certainly it is conceivable there is a world in which it's 'stuff-all-the-way down', i.e., a world in which there are no discrete material particles at all, but only more matter or stuff. Aristotle seems to have thought of the material world this way, for example: on his view the four Empedoclean elements are homogenous all the way down- e.g. every division of water yields more water but not water molecules or atoms. If the world Aristotle conceived is a possible world then there is a possible world in which it's water (the stuff) all the way down.

The point does not rely on the particulars of an ancient ontology, however. For the same goes for energy of the sort that in the actual world is convertible into matter. Energy is not *necessarily* quantized or relegated to discrete packets. Thus an energy-all-the-way-down

world is conceivable. Such a world being possible renders count-determinacy not metaphysically necessary, for just-given reasons, contra the orthodox view.

Of course, some will deny the conceivability of a world consisting of stuff or energy all-the-way-down makes it metaphysically possible. Still others might deny such worlds are genuinely conceivable. Disputing this would require a far more general discussion of conceivability and its relation to logical and metaphysical possibility. I will not attempt this here. Instead I'll simply engage in a little burden-tennis: surely the default position is that matter being ultimately particulate is contingent, such that the onus is on she who would claim a stuff-all-the-way-down world is impossible.[6] Absent such a demonstration I assume a stuff-all-the-way-down world is metaphysically possible- from which it follows that a count-indeterminate world is metaphysically possible.

Still, perhaps one might try to save count-determinacy here by arguing the apparent indeterminacy is merely epistemic or semantic, as Lewis does regarding the outback. In particular one might think the appearance of stuff's count-indeterminacy is due merely to the vagueness of terms such as 'stuff' or 'matter', where if such terms were made more precise the appearance of count-indeterminacy would disappear.

But this move fails. As indicated, on the standard (Lewisian) view of vagueness a term is vague only if it has multiple admissible precisifications, i.e., more precise candidate meanings between which speakers have not decided. Yet Lewis also argues not all terms are vague, the grounds being that some terms do not have admissible precisifications. For example, Lewis asks rhetorically what the candidates for 'and' between which we haven't

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[6] One must be careful to distinguish a stuff all-the-way-down world from a "gunk" world, i.e., a world in which there are no atoms because every object is further divisible. For in a gunk world objects are still discrete, not a mass or stuff. I further discuss this distinction's importance in the next section. So it should be kept in mind that arguments against the possibility of gunk may not pertain to the possibility of stuff. For an independent defense of stuff, see Markosian (2015).

chosen would be (1986, p. 212). Absent anything more precise that one might mean by 'and', Lewis concludes 'and' isn't vague. The same goes for logical terms more generally. But by this same standard "stuff terms" will not count as vague in a stuff-all-the-way-down world. In fact one can just mirror Lewis here: in a world where it's matter-all-the-way-down (without particles), what would be the candidates for 'matter' between which we haven't chosen? There is nothing more precise one could mean by 'matter' in such a world; there's only more matter. So 'matter' wouldn't be vague. The same applies to superficially singular referring phrases such as 'that (bit of) matter'. For no putative candidate for what is picked out by such a phrase need be more precise than any other. Lacking precisifications such terms are not vague. So count-indeterminacy in a stuff-all-the-way-down world would not be due to linguistic vagueness. It would simply be the way the world really is.

4. Arbitrary divisibility

I have argued homogeneous stuffs are count-indeterminate. Lowe (1998) agrees, though via a different line of argument. He writes

> parts [divisions] of stuff are not determinately countable, because every such part is infinitely divisible into smaller parts of the same kind of stuff. Thus, if a room contained some gold, the question 'How many parts of gold does this room contain?' could not be answered (p. 74).

By tying count-indeterminacy to infinite divisibility, Lowe suggests it is the endlessness of division that precludes count-determinacy. But this isn't quite right. For it is not (merely) the *endlessness* of division but the *arbitrariness* of each division along the way that is crucial.

Removing single particles one at a time from a composite object seems a nonarbitrary process; each division carves at a joint insofar as each division is made at an antecedently existing boundary (between the particle and its environment). So no one

division is arbitrary. Extending this process *ad infinitum*—via the posit of "gunk" rather than mereological atoms—does not render the divisions arbitrary either. Each division would be made at a boundary; each division would carve at a joint. The process would simply never end. So an infinite (unending) series of divisions need not be an arbitrary series of divisions.

The complement of joint-carving divisions are those that miss the joints. Thus one can think of joints as (antecedently established) natural boundaries relative to which any carving either hits or misses. So missing the joints yields a non-natural division, i.e., one that is arbitrary by the joint-carving standard- just as *grue* is an arbitrary classification by the same standard. Call such a joint-missing carving *weakly arbitrary*. Yet one can also imagine the absence of joints entirely: suppose that in a given domain there are no joints to hit or miss.[7] Call divisions here *strongly arbitrary*. Note that a sequence of strongly arbitrary divisions would have to be endless, for any terminus, if reached, would constitute a joint- i.e., a nonarbitrary and antecedently existing stopping point. So although a series of arbitrary divisions would be endless (infinite), not every endless (infinite) series of divisions is arbitrary. And it is arbitrary divisibility, not infinite divisibility, that yields count-indeterminacy: because there is no right or wrong way to carve up homogenous stuff, for example, no division yields any *one* bounded or demarcated—and so enumerable—entity. Or, as Lowe puts it, because homogenous stuff lacks nonarbitrary boundaries and is everywhere the same, homogenous stuff lacks a principle of individuation that would yield countably distinct constituents; though divisible, no division of homogenous stuff has *unity*, according to Lowe, and so fails to count as a *unit*- as one single thing (Lowe 2009, p. 49–50; 2003, p. 328–9, 336; 1998, p.

[7] A metaphor might help: imagine carving Jell-O rather than a turkey; in the latter there are joints one might hit or miss, whereas in the former there are no joints to hit or miss (cf. Horgan and Potrc 2000). Note that Jell-O has complex physical and chemical structure even without joints; so too might e.g. spacetime regions have complex topological or geometrical structure without having joints or boundaries (on this point see the ensuing discussion below).

72–74).[8] Moreover, and to recall an earlier point, this shows why an infinite number of numbers does not entail an indeterminate number of numbers in the sense at issue here. For divisions between numbers are natural (nonarbitrary); each number is bounded and so countably distinct from the next, as it were. Numbers, while infinitely many, are therefore not count-indeterminate in the sense at issue. It is because homogenous stuff lacks boundaries entirely that it is arbitrarily divisible and so count-indeterminate.[9]

Of course I have already argued stuff to be count-indeterminate. The reason for its inclusion here—in addition to being a second argument for count-indeterminacy in case one rejects the first—is that arbitrary divisibility yielding count-indeterminacy is applicable to several other kinds of entities as well, and so provides a second category of count-indeterminate entities. Amongst these are regions of space, and arguably time. These are not merely infinitely divisible, as is commonly observed, but arbitrarily divisible. Regions are not naturally discrete or bounded so as to come pre-enumerated. So there is no determinate number of regions of space (or time). The same goes for many tropes (particularized properties)- namely, tropes that are homogenous. For example, if every division of a red trope yields another red trope then a red trope is homogenous. Of course not every trope is like this; e.g. not every division of roundness yields roundness. But homogenous tropes are arbitrarily divisible and so count-indeterminate.

The leading candidates for trope-individuation bring this into sharper relief. Suppose tropes are primitively individuated. If any given division or sub-region of a particularized

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[8] See Olson (2011) for criticism of Lowe's argument, and Goldwater (2017) for a defense.
[9] Something akin to arbitrary divisibility is part of why Sider (2001) takes a stuff ontology to entail meta-ontological anti-realism, a view which he characterizes as rejecting joints in nature (Sider 2011, pp. 82–85). But this is a mistake. For one can deny joints in one area whilst still defending realism about joints more generally; Sider here conflates a narrow brand of meta-ontological realism about composite objects with meta-metaphysical realism about joint-carving in general. I develop this argument in greater detail in Goldwater (2017, esp. §3 and §4).

redness were itself a particularized redness—i.e., if it were red-all-the-way-down—and each trope was primitively individuated such that any arbitrary division was primitively distinct from every other, then there would be no determinate answer to 'how many red tropes are there in the region?'. The same goes if tropes are individuated by region instead; because regions exhibit count-indeterminacy tropes will inherit it. Now, it might be that if tropes are individuated by which object they are a property of this result may not obtain. But this is not really an option for the trope-theorist who adopts the bundle theory, according to which objects are built up out of ontologically prior tropes. For this theorist holds that objects are individuated by their tropes, not vice versa. Moreover, if objects are themselves individuated by spacetime regions, as discussed above, this would be problematic in any case.

An important idea here, just mentioned, is that count-indeterminacy may be *inherited*. I take it as uncontroversial that at least some events, facts, or states of affairs are in some sense built up from, or consist of, regions of space(time) and/or property-instantiations at spacetime regions. And it was just argued that such entities may be count-indeterminate due to arbitrary divisibility. But then whatever events, facts, or states of affairs are built up out of such count-indeterminate entities may themselves be count-indeterminate; the count-indeterminacy of the latter can infect the former. To illustrate: if the number of events is a function of the number of property-instantiations at some region, but there is no determinate number of property-instances or regions, then the number of events would also be indeterminate. *Mutatis mutandis* for facts and states of affairs. Of course, Wittgenstein famously argued (or, perhaps, declared) in the *Tractatus* that the world is the totality of facts- suggesting, presumably, that there is some determinate number that is the total number of facts. Equally famously, however, this view relies on (logical) atomism- the view that there are atomic or indivisible facts. If e.g. regions of space and time are not indivisible or atomic,

but are instead arbitrarily divisible, and are the components or elements of facts, then there is no determinate number of facts after all.

To briefly summarize: any type of arbitrarily divisible entity may admit of count-indeterminacy, as may complexes built up from count-indeterminate entities. As with stuff, I assume the entities under consideration, such as tropes and regions, are metaphysically possible if not actual. Therefore count-indeterminacy is possibly true if not actually true.

Lastly, yet another (sub)category is relevant here: physical fields and forces. Unless the total number of fields in the universe is one—as on a certain reading of the quantum wave function—there is no determinate number of fields. For fields may overlap, be arbitrarily divided, and lack well-defined boundaries. Of course the strength or magnitude of a field may be well-defined at any given region, such that a field might be thought nonexistent wherever it has zero strength. Even so, given multiple overlapping and interacting fields exhibiting e.g. interference or amplification, the strengths of which at any given region are a complex function of, or interaction between, various (other) fields, there may be no determinate fact as to the number of fields in a region, as opposed to their physical magnitudes at a given region. So if our world is a field-world, as many physicists posit, our world is count-indeterminate. The same goes, *mutatis mutandis*, for forces or instances of forces. Thus, a physical world of field and forces, with or without particulate matter in addition, is a count-indeterminate world.

How might the defender of count-determinacy respond? A monistic response may be tempting: if there really is just one big object that is the whole of spacetime, for example, then the number of spacetime regions would be one, determinately. Even if true, it is not clear this strategy will help with the entire range of examples given. For instance, event-monism and fact-monism seem much less plausible than space-monism. Even were one to

go monist here, however, the modal strength problem reemerges. Unless monism is necessarily true, count-indeterminacy as a logical or metaphysical possibility remains intact.

The less radical objection here again tries to write off count-indeterminacy as merely apparent; e.g. apparent count-indeterminacy is ultimately due to linguistic or semantic vagueness. But the same argument deployed against this move earlier applies here. If vagueness is semantic indecision then a term is vague only if it has multiple admissible candidates (precisifications) between which we haven't decided. Terms that refer to or designate arbitrarily divisible entities lack precisifications, however, because no candidate for the referent 'that region' or 'that trope' need be any more precise than any other. So such terms aren't vague. Therefore a world containing or consisting of arbitrarily divisible entities is a count-indeterminate world- even without (linguistic) vagueness.

5. Count-indeterminacy in the agent-domain

I turn now to the third and final category of count-indeterminacy: what I will call 'agent-domain' entities.[10] What I have in mind here are actions, beliefs, intentions, experiences, and the like, though I will focus on actions and beliefs in particular.

Unlike assertions via stuff or mass terms, assertions that someone performed a specific number of actions may be perfectly well-formed and comprehensible. One can say Jane performed one or two or seven actions, or that Jane performed more actions than Janet. Similarly, one can say one has several beliefs on a subject, or that a well-educated person has more beliefs about an academic subject than a layman does. Thus, beliefs and

[10] By 'entity' I do not mean 'object' or 'substance'. For I consider properties and relations to be entities, as well as events, facts, and states of affairs. An entity is anything that exists, or, in the linguistic idiom, anything over which one may quantify or of which one may assert existence.

actions—unlike stuff— are enumerable in that numerical ascriptions, including comparative statements, are well-formed and comprehensible.

Even so, beliefs and actions admit of count-indeterminacy because, I contend, there is no determinate *total* number of actions one performs or beliefs one has. This is not because they are infinite, however. A person does not perform an infinite number of actions over the course of a lifetime, and she certainly does not perform an infinite number of actions over a designated finite period. Yet if a person did perform a determinate finite number of actions over a designated period then that number should be specifiable. Thus, a statements such as 'Jane performed 73 actions last week' would be true but 'Jane performed 72 actions last week' and 'Jane performed 74 actions last week' would be false. My initial contention is it's absurd to think actions are individuated so finely that there *must* be a determinate number of them in any given scenario. Instead, I claim, actions may exhibit count-indeterminacy- even though actions determinately exist.

The same goes for beliefs. I do not have an infinite number of beliefs, but neither do I have a determinate finite number of them. If I did, then it would be determinately true that right now I have 87 beliefs, say, but false that I have 86 or 88. And if that were so it would be perfectly sensible—and, perhaps, mandatory—to reason as follows: were I to gain three beliefs tomorrow but lose (or forget?) two, I'd end tomorrow with 88 beliefs compared to today's 87. But this level of exactness when it comes to belief-enumeration strikes me as absurd. Better to say I have *some* or *many* beliefs but no determinate number of them.

I won't rely merely on absurdity, however. The deeper claim is that there may be cases of *indeterminate identity* between beliefs, i.e., it may be indeterminate whether some belief x is identical to some belief y, such that how many beliefs there are—in this case, one or two—may be indeterminate. Before I tackle objections consider some examples. As Frege

noted, one can have different beliefs about the Evening Star and the Morning Star even though they are identical. Similarly, one can believe that Superman can fly but not believe Clark Kent can fly. These beliefs are (or may be) numerically distinct. On the other hand, for someone who is not fooled by Clark's flimsy disguise the belief that Superman can fly may be one and the same as the belief that Clark can fly. So whether these beliefs are identical is not determined by the state of affairs they express (which is the same in each case).

Alternately, consider the belief that Superman can fly and the belief that Superman can soar. Perhaps these are distinct beliefs for someone, perhaps not. I contend that whether these are identical or distinct may be indeterminate, in which case it may be indeterminate how many beliefs one has if one believes that Superman can soar and fly. (Not to mention it may be indeterminate whether believing each separately is identical to believing the conjunction.)

Of course one might reject these examples. But they are only examples; choose others if you like. The more general question is whether *every* substitution of synonyms or near-synonyms (e.g. 'soar' for 'fly'), or every substitution of logically equivalent claims (e.g. 'Superman can soar and fly' for 'Superman can soar and Superman can fly') yields a determinately identical or determinately distinct belief. If not then beliefs exhibit count-indeterminacy.[11] Of course, my claim is that such indeterminacy is quite possible.

I'll now consider four lines of objection. The first concedes that beliefs may be count-indeterminate but again holds this is due to linguistic vagueness, and so has no

[11] M*utatis mutandis*, the same goes for actions, experiences and the like. For instance, whether <my moving my left arm to scratch a portion of my head to relieve a particular itch> is identical to <my moving my left arm to scratch my head to relieve some itch>, on the other hand, may be indeterminate. Again, this is just an example; others may be more compelling. Insofar as there are *any* cases of it being indeterminate whether actions x and y are identical, however, actions will exhibit count-indeterminacy- even if there are *some* determinate cases of numerical identity and difference. Though the following discussion will mostly be couched in terms of belief, it should be kept in mind that the arguments here may be applied to other agent-domain entities.

metaphysical implications. The second, which is perhaps a variant of the first, holds that beliefs are resolvable into constituent elements which are themselves count-determinate. The third holds that because every substitution of near synonyms yields numerically distinct beliefs—e.g. it is determinate that the belief that Superman can fly is distinct from the belief that Superman can soar—beliefs are count-determinate. The fourth is Evans' (1978) more general (putative) *reductio* against the very possibility of indeterminate identity.

So consider the first objection, which grants beliefs are count-indeterminate but claims this is only due to linguistic vagueness; suitably precisified, it is determinate whether beliefs x and y are identical. But linguistic vagueness is not the culprit here. First, note that whether (general) terms such as 'soar' and 'fly' are vague is distinct from whether singular referring expressions such as 'my belief that Superman can fly' are vague. Second, note that even if 'soar' and 'fly' are coextensive when suitably precisified, this is irrelevant; 'Clark Kent' and 'Superman' being coextensive does not make beliefs expressed via 'Clark Kent' and 'Superman' identical. Even so, one might nonetheless think being coextensive is necessary if not sufficient for beliefs expressed via distinct terms to be identical; thus, not being coextensive would render the beliefs containing those terms determinately not-identical.

But this need not be the case. Precisifications are typically *artificially* precise. For example, creating a list of possible different senses of 'bald' via numeric subscripts—e.g. $bald_1 =_{df}$ fewer than n hairs, $bald_2 =_{df}$ fewer than n-1 hairs, etc.—is an artifice. And not having such an artificially precise sense in mind may preclude the artificially precise class as being part of the (occurrent) content of the belief. Of course, this claim takes us into tricky issues regarding externalism (and, perhaps, the extended mind hypothesis) which I cannot enter into here. I will note, though, that there is surely a difference between the content of a belief and the belief itself. And even if a belief is partly individuated by its content, which is itself

(partly) individuated by e.g. mind-independent class membership, what actually occurs to a subject is crucial. For as argued above, whether one's belief that Superman can fly is distinct from one's belief that Clark Kent can fly depends at least partly on whether one knows Clark is Superman; the believer's state of mind and background knowledge, in addition to the belief's (generic) content, contributes to belief-individuation. As a result, even if the content of 'Superman can fly' can be distinguished from 'Superman can soar', my being ignorant of the difference may mean it plays no role in the individuation of *my* beliefs.

Return, then, to the putative vagueness of 'my belief that Superman can soar', and (what I'm arguing is) the indeterminacy of identity between 'my belief that Superman can soar' and 'my belief that Superman can fly'. My opponent here must claim these can be precisified so as to resolve the indeterminacy. Yet as argued above, rendering these as artificially precise will not do the job. For too much artificial precision may rule out a candidate as an *admissible* candidate. But neither will a less artificial example help. Suppose one thought 'Superman can soar' could be precisified as 'Superman can fly majestically'. But this simply reiterates the issue; whether a subject has one or two beliefs if they believe each may also be indeterminate. And if so, a regress threatens.

If one is skeptical, a distinct line of argument shows the indeterminate identity of belief is not due to linguistic vagueness. Consider non-verbal beliefs, i.e. beliefs not expressed via words. Because such beliefs are not expressed by words, vague words cannot be the source of their count-indeterminacy, *a fortiori*. Take nonhuman animals, some of which I assume have beliefs. For instance, my cat's belief that there's tuna in the bowl is numerically distinct from my cat's belief that the litter box needs changing, but there may be no determinate fact as to whether my cat's belief that there's tuna in the bowl is numerically distinct from his belief that there's a certain kind of tuna in the bowl. And I see no reason

why one should be able to resolve, or make determinate, every possible case of apparently indeterminate identity regarding an animal's beliefs. So even though a), some cases exhibit clear numeric distinction, and b), how many beliefs a cat has, overall, is fewer than how many a person has (by dint of lacking many of our complex belief-forming mechanisms), there is still no determinate number of beliefs that a cat has.

Returning to the concept of being low-resolution may help here. In this context my claim is that beliefs are *inherently low-resolution entities*; they cannot be resolved into discrete enumerables.[12] Being low-resolution is a comparative term, however. So the point about cats is illustrative: cats' beliefs *are even lower-resolution* than our beliefs, and so admit of even less count-determinacy than do human beliefs. Due to language, human beliefs are more finely individuatable or distinguishable than a cat's- but, I claim, not so finely as to permit count-determinacy in all possible cases.

Moreover, this also blocks another path to restoring the count-determinacy of belief: viz., that every substitution of synonyms or near-synonyms (e.g. 'fly' for 'soar') produces a numerically distinct belief. For even if the number of *articulated* beliefs were determinate, that there are some unarticulated or nonverbal beliefs renders beliefs count-indeterminate.[13]

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[12] Typically talk of boundaries concerns spatial and temporal boundaries; topology seems to be the basis of boundary talk (cf. Keil 2013). So it may be easier to imagine nonspatial (or not obviously spatial) entities such as beliefs or actions as having indeterminate or blurry borders.

[13] Here's another argument against saving count-determinacy by the substitution-yields-distinct beliefs view. If how exactly a belief is articulated (e.g. via 'fly' or 'soar') generates a new belief, but I have yet to articulate *a* (i.e. one) belief, it may be indeterminate how many other nigh-identical beliefs I have in the vicinity. If I believe Superman can fly and also that he can soar, but I've never explicitly thought about whether he can glide, hover, or take to the air, do I have five beliefs? Or, perhaps, do I have two actual and three potential beliefs, one for each possible substitution? More generally is there a determinate number of possible beliefs I have based unarticulated permutations? (Recall Quine's (1948) skepticism that there is a determinate number of possible bald men in the doorway.) I think not. Rather, my beliefs in this context exhibit count-indeterminacy. Granted, beliefs are not closed under implication. Even so, one undoubtedly does believe *some* of what one's beliefs entail, even without articulation. *How many* of the consequences of one's beliefs one believes is itself indeterminate, however. Or so I claim.

Turn now to the next line of defense for count-determinacy here: namely, that beliefs are resolvable. This splits into two variants. The first claims that beliefs (and actions, etc.) resolve into enumerables within the agent-domain, and that the number of beliefs or actions performed is some function of the number of underlying enumerables. For example, suppose one thinks an action is some combination of a physiological movement such as turning a knob, an intention such as trying to turn the knob, and a goal, such as opening the door. One might then think the total number of actions one performs is the total number of triples <intention, goal, movement>, or something along these lines.

The problem, though, is that the elements of this ordered triple may suffer from the same count-indeterminacy as actions themselves. People do not have a determine total number of intentions or goals for the same reasons they do not perform a determinate total number of actions, or have a determinate total number of beliefs: intentions and goals are not individuated finely enough to necessitate count-determinacy. Zooming in or resolving actions does not reveal count-determinacy; actions too are low-resolution all-the-way-down, I claim, at least as long as we stay in the agent-domain of intentions, goals, beliefs, and the like. There will therefore be indeterminate identity statements for actions as well.

To avoid this result the second strategy leaves the agent-domain by reducing actions (or beliefs, etc.) to physiological processes or brain states, which are then, in turn, argued to be count-determinate. I will simply record my skepticism here; I do not think actions or beliefs are going to (turn out to) be numerically identical to any such reductive base, nor that there being a determinate number of neural firings, say, will fix the (determinate) number of actions or beliefs one has even by some relation other than identity, such as supervenience. Granted, properly defending this claim goes beyond the scope of this paper. Even so, two points can be made quickly. First, if the thesis of count-determinacy turns on whether

actions or beliefs are reducible to brain-states, this goes well beyond the support that defenders of the orthodoxy of metaphysical determinacy provide For instance, Lewis does not argue that the only intelligible account of vagueness is linguistic or mental by appealing to reductive materialism about the mind. Second, all that is required for my thesis, ultimately, is that there *could be* an indeterminate number of actions or beliefs. So if the reductionist thesis here is itself only contingent and thus false in some possible worlds, then there are possible worlds in which actions, beliefs, and intentions do exhibit count-indeterminacy.

5.1. Evans' argument against indeterminate identity

I have argued for count-indeterminacy via indeterminate identity. Yet Evans (1978) famously offers what is intended as a formal *reductio* of indeterminate identity. The argument runs as follows. Suppose it's indeterminate whether a=b. It follows that a has the property of being (such that it is) indeterminately identical to b. However, b does not have this property; b is (such that it is) determinately identical to b. Because a and b have different properties, a and b are not identical- determinately. Contra the original supposition.

Evans' argument is not decisive, however. For one, there are several ways to resist the first inference (i.e., the lambda abstraction). For instance, one can simply deny there is any such property as *being such that it is indeterminately identical to something*; clearly there being such a property relies on a highly liberal or abundant conceptions of properties, and such a conception is hardly mandatory.[14] Second, and even granting such a property, the inference may be invalid- for it moves from a *de dicto* reading of indeterminacy—that it is indeterminate

[14] That said, Williams (2008) claims "one should not get too worried by the appeal to property-talk here", for one could read the claim in a more "lightweight" way: 'a has the property of being such that F' can be read as 'a is one of the Fs'- in this case, that a is one of the things that is indeterminately b. Whether one can talk about being *one* of the Fs in the context of the uncountability thesis without begging crucial questions, however, remains to be seen.

that (a=b)—to a *de re* reading- that a has the property of being indeterminately identical to b. There is certainly precedent for being skeptical of such an inference; the analogous *de dicto* to *de re* move has long been controversial in modal contexts, for example. In particular, the Barcan formula—according to which 'possibly, someone exists who is my sister' entails 'someone exists who is possibly my sister'—remains controversial. So there is certainly no guarantee that one can infer the *de re* claim from the *de dicto* claim.

That said, one might nonetheless think one *can* infer the *de re* indeterminacy claim from the *de dicto* claim *here*, even if not universally. But this isn't so. As Williams (2008) and Barnes (2010b) argue, linguistic vagueness may not be the only source of a name's referential indeterminacy: names could also fail to determinately refer due to genuine metaphysical indeterminacy- even given a semantic decision. As Williams puts it,

> The reference relation has two ends: and indeterminacy in how the world is can generate referential indeterminacy just as much as a lack of semantic conventions specifying the conditions under which an object gets picked out (2008, p. 779).

So, if due to metaphysical indeterminacy it can be indeterminate what 'a' and 'b' refer to, Barnes argues it can be indeterminate what identities hold. From here she claims "it can be indeterminate what identities hold without there being some thing a and some thing b such that it's indeterminate whether a=b" (2010b, p. 960). So, Barnes and Williams conclude, Evans' inference from the *de dicto* claim to the *de re* claim fails.

Yet one might object that *my* thesis is naturally construed as a *de re* claim- given that I claim there may be some belief a and some belief b such that it is indeterminate whether a=b. And one might think that Evans' argument does successfully ban *de re* indeterminate identities, in which case I cannot help myself to the Barnes/Williams line of defense.

But this is not the case. For the idea of referential indeterminacy due to metaphysical indeterminacy saves even the *de re* reading. As above, if because of metaphysical

indeterminacy a=b is indeterminate, this is because it is indeterminate what 'a' and 'b' refer to. But if it is indeterminate what 'a' and 'b' refer to, then it is indeterminate what 'b' refers to (by conjunction elimination). And if so, then 'b=b' may also be indeterminate! Not because identity is vague, or because something is not self-identical, but because there is no guarantee that both instances or tokens of 'b' refer to the same thing.

Compare the claim 'Robert=Robert'. This may seem obviously (and necessarily) true. But in fact it's (actually) false if asserted of two different people named Robert. So, the identity claim is determinately true if there's one person in question and determinately false if two. Yet if it were indeterminate whether there are one or two—or if it were indeterminate whether both tokens of 'Robert' codesignate—then the identity claim 'Robert=Robert' would be neither true nor false but indeterminate. To resolve the indeterminacy, then, there must be some mechanism for revealing whether the two exactly similar tokens flanking the identity sign designate the same thing, or different things- i.e., there must be some way to determinately assign symbols to things. While having a domain of quantification in which there is exactly one or exactly two people named Robert would settle the question and allow for determinate assignments, saying this *must* be so *presupposes* count-determinacy- i.e., there *being* determinately one or determinately two people in the relevant domain. And naturally that presupposition would beg the question. For if instead there was metaphysical (count) *in*determinacy, it could be indeterminate how many objects there are in the relevant domain, in which case symbols might not be determinately assignable for the reasons Barnes and Williams point out. In which case it could well be indeterminate that Robert=Robert.[15,16]

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[15] Here's another move that won't work. Stipulate that by 'a' one means a and not b. But this presupposes a and b are distinct. And if a and b are identical, then one *does* mean b by 'a'. Stipulation cannot resolve metaphysical indeterminacy; stipulating that one intends to refer to one thing and not a second thing cannot (magically) make it the case that there is, determinately, either one thing or two things to refer (or not refer) to.

So to briefly summarize: for some statement 'b=b' it can be indeterminate that the first instance of 'b' refers to the same thing as the second instance of 'b' for the same reason it may be indeterminate that 'b' refers to the same thing as 'a' in 'a=b'- namely, because it is indeterminate what 'b' and 'a' refer to! So contra Evans, even 'b=b' may be indeterminate; assuming otherwise—as Evans does—presupposes a count-determinate domain, which begs the question. Therefore Evans does not provide an independent argument for count-determinacy.[17,18]

I'll conclude this section with a general point. Recall a dictum of Aristotle's: that one cannot be more precise than a subject matter permits (*Nicomachean Ethics* Book 1 Section 7). Generally speaking, my claim here is that actions, beliefs, intentions, and the like are simply not so precise or sharply-bordered as to necessarily admit of determinate numerical totals. Agent-domain entities are only resolvable so far, and there is such a thing as trying to resolve

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[16] Suppose one thought one could resolve the indeterminacy by introducing distinguishing subscripts, e.g. $Robert_1$ and $Robert_2$, and claiming it would be determinately true that $Robert_1=Robert_1$. But this move doesn't work either. For as many people can be named '$Robert_1$' as can be named 'Robert'. Calling someone 'one' doesn't make them determinately one any more than calling something 'the most perfect being' makes a perfect being exist (cf. previous footnote).

[17] But surely, one might object, b is determinately identical to itself even if 'b' does not determinately refer; to think otherwise is to commit a use/mention fallacy. Not so. Removing single-quotes from 'b'—thereby intending to use 'b' rather than mention it—does not change the fact that one is still using (rather than mentioning) a term—i.e., a sound or a mark on paper or an image on a screen—which may not determinately refer. That is, just because one can distinguish between the name 'b' and the thing b doesn't avoid the fact that I'm still using the token 'b' to talk about "the thing b". (Erasing or deleting a quotation mark is not a magic power that gives immediate access to noumenal reality, as it were.) So which thing b is can be indeterminate, just as which thing 'b' refers to can be indeterminate.

[18] But why should 'b=b' require two acts of reference at all? (My thanks to an anonymous referee for this journal for the challenge.) Two reasons. One is that any statement of the form 'x=y' requires two acts of reference, i.e., an assignment for each variable. That the constants substituted for the variables might or are intended to be coextensive does not alter that, especially where it is contentious, as it is here, whether they are in fact coextensive. Second, I take it that a sentence or proposition requires more than one linguistic act, as it were, by contrast with a single sub-sentential term. For simply saying a name is not a sentence; at minimum a sentence requires an additional act of uniting or coupling the subject and predicate. But then to unite a relational predicate with a subject, one needs a further act of reference for each *relatum* to complete the proposition; otherwise one has in effect a list of unrelated sub-sentential elements. Thus multiple acts of reference are required for the proposition 'b=b'- as opposed to when one just utters the name 'b'.

an image beyond its capacity; as described earlier, putting a blurry image under a microscope does not make the picture sharper. Treating actions and beliefs as determinately individuatable and so countable may be useful in some contexts, but the reality of beliefs, actions, and intentions may well be messier—less determinate, more blurry or hazy—than those contexts reflect.

6. Further objections and replies

6.1 The argument from vagueness

According to Lewis' (1986) and Sider's (2001) "argument from vagueness", there must be a determinate number of concrete material objects. Naturally this might be taken as incompatible with my thesis. So I'll consider this argument in some detail, for two reasons. One is that accepting my earlier arguments for count-indeterminacy does not itself identify where exactly the argument from vagueness goes wrong.[19] The second is that the argument has been highly influential. In particular it has lead many to reject "moderate" answers to the special composition question, and to instead embrace the extremes of mereological universalism or nihilism (see esp. Korman 2010). Though space precludes reexamining its applications to mereology more generally, my counterargument here may well suggest a reexamination is in order. Still, I'll put that broader question aside and consider the argument here only as a possible rebuttal to the count-indeterminacy thesis.

Leaning on Sider's (more-detailed) formulation, the argument from vagueness runs as follows. Let a *numerical sentence* be a sentence that asserts 'there are exactly n concrete objects', for some finite n. According to Sider numerical sentences contain only logical terms and the predicate 'C' for concreteness; the numerical sentence—henceforth 'n-sentence'—

[19] My thanks to an anonymous referee for this journal for pressing this issue.

for n=2, for example, is $\exists x \exists y$ [Cx & Cy & $x \neq y$ & $\forall z$ (Cz → [x=z ∨ y=z])]. Sider then asks the reader to consider a world in which there are only two mereological simples. Whether a third object—the composite— exists can be asked simply by asking whether the n-sentence for n=2 is true. So n-sentences are adequate for expressing the existence of a mereological sum. Sider then argues that each term in a numerical sentence lacks admissible precisifications and is therefore nonvague (2001, pp. 128-132; see also Sider 2009 for elaboration).[20] Because numerical sentences consist entirely of nonvague terms, how many objects exist may be expressed in an entirely nonvague (precise) language.

Sider then asks the reader to suppose for *reductio* that it can be vague whether a sum—a third object—exists. One is thus to "imagine counting all the concrete objects in the world. One would need to include all the objects in the class in question, but it would be indeterminate whether to include another entity: the fusion of the class" (2001, p. 127). So the n-sentence for this scenario would be indeterminate. But this is absurd, Sider reasons. N-sentences consist entirely of nonvague vocabulary. So their truth-value cannot be indeterminate. So it cannot be vague whether a sum exists. It must therefore be the case that how many objects there are is determinate.

Before one attempts to wield this as an objection to my proposal, however, two points must be emphasized. First, one would need to infer from 'the number of objects is determinate' to 'the world itself is count-determinate'. But it is not obvious Sider's argument achieves this. To presage my subsequent point, it may be that even if objects are count-determinate there may also exist count-indeterminate stuff (or space, or tropes, or beliefs,

[20] For example, Sider argues there is only one domain containing *all* the objects, and so only one unrestricted domain. Therefore there is only one candidate meaning (extension) for $\exists$, taken as unrestricted. Because having multiple candidate meanings (precisifications) is necessary for a term's being vague, the lack of alternate candidate meanings entails $\exists$ is not vague.

etc.), rendering the world count-indeterminate despite containing a domain of count-determinate objects. Second, it should be kept in mind that I am not defending vague or indeterminate existence; I am not claiming that something "sort of is and sort of isn't", as Lewis puts it in the context of his formulation of the argument from vagueness (1986, p. 212). Rather, I am arguing that *determinate* existence is compatible with count-indeterminacy-because, for example, stuff-all-the-way-down can determinately exist whilst being count-indeterminate.

With this in mind consider again the argument from vagueness—in particular Sider's formulation, which I'll call "the n-sentence argument"—in a world containing stuff-all-the-way-down (or any other entity I've argued to be count-indeterminate). Next consider two variants. Let w1 be a world in which there is stuff-all-the-way-down but no mereological simples or composites in addition. Let w2 be a world in which there is stuff-all-the-way-down but which also contains mereological simples (and, perhaps, composites of simples, though this makes no difference.)

Now, in w1 or w2 or both, either a numerical sentence would be precise or it wouldn't be. First suppose an n-sentence is precise in w1 (i.e., a world containing stuff-all-the-way-down but no mereological simples.) Would the precision of the n-sentence entail that stuff-all-the-way-down would be count-determinate after all? I see no reason to suppose it would. As argued above, terms such as 'matter' and 'that matter' lack precisifications because there is nothing more precise that could be meant by them in a stuff-all-the-way-down world. Lacking precisifications such terms wouldn't be vague. But as also argued earlier this is perfectly compatible with matter being count-indeterminate. Recall that Barnes and Williams make a similar point. We can make words as precise as we like, they argue, but if the world itself is in some way indeterminate nothing we can do on the language end can

change that; in slogan form, linguistic precision cannot overcome worldly indeterminacy (Barnes 2010a, p. 960, following Williams 2008, p. 779). So the precision of the n-sentence at w1 would not entail the count-determinacy of w1.

Nor would it in w2. Suppose the n-sentence's terms are precise because they pick out discrete mereological simples. Even if this would entail that the number of material objects is determinate, as Lewis and Sider contend, the world itself wouldn't be count-determinate because there would also be count-indeterminate stuff in addition. So in neither case is the n-sentence's precision a counter to count-indeterminacy as understood in this paper.

So suppose instead that an n-sentence wouldn't be precise in w1 due to the nature of a stuff-all-the-way-down world. But then even if it were valid the n-sentence argument wouldn't be sound: if a stuff-all-the-way down world is the sort of world which would preclude an n-sentence from being precise, then the premise(s) asserting that an n-sentence consists entirely of precise terms would be false (in w1). So even if count-determinacy would follow from an n-sentence being precise (contra my argument above), the imprecision of an n-sentence in a stuff-all-the-down would fail to undermine worldly count-indeterminacy. Clearly the same goes, *mutatis mutandis*, for w2.

So count-indeterminacy is not threatened by the argument from vagueness in general nor the n-sentence argument in particular. Even if the number of mereological simples or composites must be determinate it simply does not follow that worldly count-indeterminacy cannot also obtain. Determinate existence is indeed compatible with count-indeterminacy.

6.2. Concreteness

Earlier I claimed count-indeterminacy pertains to concrete rather than abstract entities. Yet one might doubt that some of the entities I've argued to be count-indeterminate are in fact concrete.[21] But this is a mistake.

Although the criteria for being concrete are contested, there is certainly a consensus on the candidate criteria. And by most if not all such measures the entities I hold to be count-indeterminate are concrete. For example, many think having spatiotemporal location is sufficient for being concrete. Stuff is certainly spatiotemporally located. Events and actions are also spatiotemporally located, as are tropes (particularized properties). And if spatial regions do not themselves *have* spatial location they *are* spatial locations, and that should suffice.

There is a natural objection here, though. For one might think a criterion for being non-concrete is being known via abstraction. So one might object to my claim that tropes—particularized properties—are concrete because a), they are known via abstraction, and b), properties (and relations) are paradigmatically abstract entities, where being abstract and being concrete are mutually exclusive. But this trades on an equivocation between distinct senses of 'abstract'. Although tropes—particularized properties—are sometimes described as "abstract particulars" (Campbell 1981), this terminology, however entrenched, is misleading. For the sense of 'abstract' Campbell employs is akin to 'extract'; i.e., something that is drawn out of something else for selective attention (this is, indeed, the etymology of 'abstract'). For instance Campbell talks of selectively attending to something's redness but not its roundness. But 'abstract' in this sense does not contrast with 'concrete' any more than 'extract' does. Moreover, this sense of 'abstract' is distinct from the (more traditional) idea of abstraction as successive generalizations. Paying attention only to the redness of an object while ignoring

[21] Note too that Sider restricts n-sentences to *concreta* to rule out entities, such as numbers, that are infinite and would therefore render an n-sentence determinately false rather than indeterminate.

its roundness is not the same process as generalizing from cats to mammals to animals to vertebrates. If knowing universals or kinds via successive generalization makes them abstract, fine. But tropes—which are known by selectively ignoring contiguous features of their spatiotemporal environment—are concrete (cf. Goldwater 2015, p. 370).

Another candidate criterion for concreteness is causal potency; hence the traditional nominalist claim that abstract universals would be unknowable. But it is also orthodox to take events or states of affairs as the *relata* of causal relations. Which would make them concrete. And obviously stuff or matter can stand in causal relations, in which case stuff is concrete. I also assume beliefs and intentions have a causal role in actions, which are themselves causally potent. The same even goes for property-instantiations; surely instances of mass and charge are causally potent and so are concrete properties. So by any reasonable measure most if not all of the entities I argue to be count-indeterminate satisfy the criteria for being concrete rather than abstract.

7. Conclusion

The orthodox view of metaphysical indeterminacy is that there isn't any. Wherever indeterminacy appears, according to the traditional view, it is due to epistemic or semantic limitations such as our finite faculties or imprecise predicates. Yet as noted, in recent years there has been pushback: for example Barnes, Williams, and Wilson have defended various forms of metaphysical indeterminacy. In this paper I have argued for another kind of metaphysical indeterminacy: count-indeterminacy. Yet I have done so without invoking vague or indeterminate existence. My arguments therefore suggest that count-indeterminacy may be a basic feature of how things *are*.

In closing an interesting upshot is worth recalling. Many see the task of metaphysics as producing an ontology- a list or inventory of what exists. A natural concomitant is to think the list has determinate cardinality (cf. Schaffer 2009, p. 349-50 n2, Van Inwagen 2009; 2002). My arguments in this paper suggest this need not be the case, as count-indeterminacy entails the possibility of an ontology lacking determinate cardinality. So even if (first-order) metaphysical views tend to be independent of meta-metaphysical views, the metaphysics of count-indeterminacy may imply a revision to the meta-metaphysical view of metaphysics as aiming to articulate a numbered list of what there is.

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