The Ultra-Thin Conception of Objecthood

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In his excellent new book,[1] Øystein Linnebo develops a conception of objecthood that allows for *thin objects*: objects whose "existence does not make a substantial demand on the world" (p. 4).[2] His proposal is premised on the Fregean dictum that to be an object is to be the referent of a possible singular term (p. 22). As a result, much of Linnebo's argumentation is focused on defending a "thin" conception of reference, which is liberal enough to allow for thin objects.

This paper is a critique of Linnebo's conception of reference.

1 The Ultra-Thin Conception of Reference

To explain what Linnebo's thin conception of reference consists in, it is useful to start with a distinct but related proposal, which Linnebo calls the "ultra thin" conception of reference. I'll present my own version of the ultra-thin conception here, with apologies to Linnebo.

Some preliminaries: (1) I will restrict my attention to first- and higher-order languages, so as to simplify the exposition; (2) I will assume that such languages are governed by a negative free logic, so as to allow for empty singular terms; and (3) I will assume that an *interpretation* $[\![\ldots]\!]$ of a language L is function that assigns a (coarse-grained[3]) proposition to each sentence of L. We then have:

[1] *Thin Objects*, OUP, 2018. All page references are to this text.

[2] Here I restrict my attention to objects are thin "in the absolute sense". But it is worth pointing out that Linnebo thinks that "[a]n object can also be thin relative to some other objects if, given the existence of these other objects, the existence of the object in question makes no substantial further demand" (4).

[3] A coarse-grained proposition can be modeled as a set of metaphysically possible worlds.

The Ultra-Thin Conception of Reference Let c be a singlar term of L and let $[\![\ldots]\!]$ be an interpretation of L. The following conditions are jointly sufficient for c to refer, as interpreted by $[\![\ldots]\!]$:

1. $[\![\ldots]\!]$ preserves logical entailments;[4]
2. $[\![\ulcorner \exists x(x = c)\urcorner]\!]$ is a true (coarse-grained) proposition.

It is useful to consider an example. Let $L^{\mathbb{N}}$ be the language of first-order arithmetic and let

$$[\![\phi]\!]^{\mathbb{N}} = \begin{cases} \top, & \text{if } \phi \text{ is true on the standard interpretation of arithmetic} \\ \bot, & \text{otherwise} \end{cases}$$

where $\top$ is the trivial proposition and $\bot$ is the absurd proposition. Since $[\![\ldots]\!]^{\mathbb{N}}$ is an interpretation of $L^{\mathbb{N}}$ that preserves entailments and is such that $[\![\text{“}\exists x(x = 0)\text{”}]\!]^{\mathbb{N}} = \top$, the Ultra-Thin Conception of reference entails that the numeral “0” refers, as interpreted by $[\![\ldots]\!]^{\mathbb{N}}$. Which object does it refer to? Assuming our metalanguage is an extension of $L^{\mathbb{N}}$, we can answer the question disquotationally and say that it refers to 0.

This is an arresting result. It shows that a proponent of the Ultra-Thin Conception of reference is in a position to conclude—on the basis of purely linguistic considerations—that “0” refers to 0, and therefore that 0 exists. And, of course, the argument would go through with respect to any numeral. So a friend of the Ultra-Thin Conception is in a position to conclude—on the basis of purely linguistic considerations—that the natural numbers exist.

2 The Thin Conception of Reference

Linnebo thinks that conditions 1 and 2 of the Ultra-Thin Conception are “not sufficient for a term to refer”,[5] and therefore that “ultra-thin conceptions are

[4] $[\![\ldots]\!]$ preserves entailments iff whenever $\Phi \models \Psi$, the following condition is met for any world w : if for any $\phi \in \Phi$, $w \in [\![\phi]\!]$, then for some $\psi \in \Psi$, $w \in [\![\Psi]\!]$.

[5] The full quote is “I conclude that it is not sufficient for a term to refer that there is a logically acceptable translation from language containing the term to an interpreted language that does not” (p. 93). Linnebo's definition of “logically acceptable translation” guarantees that any such translation can be used to characterize an interpretation that respects logical entailments, on the reasonable assumption that the translating language is itself interpreted so as to respect logical entailments. And although the passage above does not explicitly mention the condition that $\ulcorner \exists x(x = c)\urcorner$ be interpreted as a true sentence, it is clear from §5.1 that he sees the condition as a constitutive part of the proposal.

unacceptably liberal in their ascription of reference" (p. 93). But he also thinks the Ultra-Thin Conception is not too far from the truth. He thinks conditions 1 and 2 are sufficient for reference when supplemented by a third condition. More specifically, he accepts:

The Thin Coinception of reference Let c be a singlar term of L and let $[\![\ldots]\!]$ be an interpretation of L. The following conditions are jointly sufficient for c to refer, as interpreted by $[\![\ldots]\!]$:

1. $[\![\ldots]\!]$ preserves logical entailments;
2. $[\![\ulcorner \exists x(x = c)\urcorner]\!]$ is a true (coarse-grained) proposition;
3. there is a partial equivalence relation,[6] $\sim$, such that:
   (a) $[\![\ldots]\!]$ interprets the language in such a way that c is governed by a predicative abstraction principle based on $\sim$;[7] and
   (b) a suitably positioned agent with an adequate grasp of $\sim$ uses the language in accordance with $[\![\ldots]\!]$.

Condition 3 is a substantial constraint. For example, it is not satisfied by our interpretation $[\![\ldots]\!]^{\mathbb{N}}$ of the language of arithmetic, given assumptions that Linnebo accepts.[8] (Notice, in particular, that Hume's Principle can't

[6]A partial equivalence relation is a relation that is symmetric and transitive but not necessarily reflexive.

[7]More specifically, c must be a singular term $\ulcorner f(\kappa)\urcorner$ for κ a closed first- or higher-order term, and $[\![\ldots]\!]$ must be such that:

$$[\![\text{“}\forall\alpha\forall\beta(f(\alpha) = f(\beta) \leftrightarrow \alpha \sim \beta)\text{”}]\!] = \top$$

where "κ" is an admissible substitution instance of the bound variables, and the biconditional is a "predicative" abstraction principle, in the following sense: "An abstraction principle is impredicative if the terms on its left-hand side denote objects included in the range of some quantifier occurring on its right-hand side; otherwise the abstraction principle is predicative." (p. 97)

[8]Two assumptions are needed. The first is that condition 3b is only satisfied if it is possible to give a specification of $[\![\ldots]\!]$ using a "logically acceptable translation"; more precisely: if there is a recursive function τ from our object language L to a "base" language L' such that $[\![\phi]\!] = \{w : \tau(\phi) \text{ is true at } w\}$, $\Sigma \models \phi$ entails $\{\tau(\psi) : \psi \in \Sigma\} \models \tau(\phi)$, and $\tau(\ulcorner\neg\phi\urcorner) = \ulcorner\neg\tau(\phi)\urcorner$. The second assumption is that the the domain of L' is not necessarily infinite. As Linnebo shows in §6.4, it is a consequence of Gödel's Theorem that these two assumptions cannot be satisfied when $[\![\ldots]\!] = [\![\ldots]\!]^{\mathbb{N}}$.

be used to satisfy condition $3a$ because it is not a predicative abstraction principle.)

Fortunately, Linnebo's focus on predicative abstraction principles does not interfere with his ability to do arithmetic. He introduces a sophisticated method for working with infinite iterations of predicative abstraction principles, which allows him recover arithmetic and much of standard set theory (Chapter 3). It is nonetheless true that the sufficient condition for reference of the Thin Conception is significantly more demanding than the sufficient condition of the Ultra-Thin Conception. The principal aim of this paper is to explore the question of whether there is good reason to insist on this additional requirement.

3 The Bucket View

There is a natural picture of reference that is at odds with both thin and ultra-thin conceptions of reference. It consists of the idea that there is a "metaphysically distinguished" domain—a domain of objects that can be singled out on the basis of purely metaphysical considerations—and that a singular term can only refer if it refers to some object in the metaphysically distinguished domain. I will refer to this conception of reference as the **Bucket View**, since one might think of the metaphysically distinguished domain as a "bucket" from which non-empty singular terms are required to draw their reference.

From the perspective of the Bucket View, the thin and ultra-thin conceptions of reference are both highly irresponsible. For they treat singular terms as referential without bothering to verify whether the supposed referents are, in fact, included in the bucket. We have seen, for example, that the Ultra-Thin Conception delivers the conclusion that "0" refers to 0 on the basis of purely linguistic considerations—and so, in particular, without verifying whether the bucket includes 0.

There might be a way of making the Bucket View consistent with the letter of a thin or ultra-thin conception of reference. For one might postulate an "ultra capacious" bucket: one that contains not only 0 but also a referents for any singular term that might pass an ultra-thin sufficiency test for reference.[9] But such a reconciliation would go against the spirit of a thin and ultra-thin conceptions of reference. For the relevant sufficiency conditions

[9]Compare Balaguer 1998, Eklund 2006, and Eklund 2008.

are not meant to be risky: they are not meant to rest on tacit assumptions about the contents of the bucket. Instead, the thin and ultra-thin conceptions are meant to sidestep the Bucket View altogether. They are supposed to steer clear of the idea that a reference claim might misfire because of an insufficiently capacious bucket. That is simply not how reference works.

4 Towards a Positive Proposal

It is well and good to insist that the Bucket View is mistaken. But such insistance is no substitute for a positive proposal. In particular, it is no substitute for a picture of objecthood on which it is clear how reference might work in the absence of a bucket.

Frege's dictum—to be an object is to be the referent of a possible singular term—is a start, but it's not quite what we're after. For although the dictum is often read as suggesting a picture of objecthood that is at odds with the Bucket View, it could also be read—perversely—as the claim that every item in the bucket is essentially such as to be available to be referent of a possible singular term. As a result, Frege's dictum is not an especially articulate way of describing an alternative to the Bucket View.

In the next few sections I will charcterize a conception of objectood that is more articulate than Frege's dictum and can be used to motivate a conception of reference that steers clear from the Bucket View. I shall refer to it as the **Network Conception of Objecthood**.[10]

5 An Analogy

By definition, a *meter* is the length travelled by light in vacuum over 299792458^{-1} seconds; by definition, a *foot* is the length travelled by light in a vacuum over 983571056^{-1} seconds. Neither of these definitions is arbitrary. Each of them is constrained by the history of measurement and by serious scientific work. Nevertheless, the meter and the foot are *parochial* units of measurement, in the following sense: when practical considerations are set aside, there is no

[10]Views in the general vicinity of the Network Conception have been discussed by a great many philosophers, including not just Frege (1884) but also Dummett (1981), Wright (1983), Rosen (1993), Stalnaker (1996), Burgess (2005), Sidelle (2002), Glanzberg (2004), Chalmers (2009), Eklund (2009), Hirsch (2010), and Thomasson (2015).

real reason to adopt one rather than the other, or to eschew them both in favor of a third.

Imagine a critic, who insists on "objective" units of measurement. "I'm not interested in parochial descriptions of the world"—she says—"I want you to tell me the length of this road using units that are *objectively correct*." The request is confused. There is no such thing as an "objectively correct" unit of measurement. There are certainly objectively correct *descriptions* of the way the world is. But a parochial unit can be used to give an objectively correct description of the way the world is. When I say, for example, that my desk is $2m$ long ($\pm 1\%$), I am giving an objectively correct description of the way the world is.

Selecting a unit of length is not a matter of choosing a suitable item from a "bucket of units": a domain of units that is singled out on the basis of purely metaphysical considerations. It is a matter of setting up a *system* for comparing the lengths of different objects. Such a system might be practical or impractical, depending on the ease and accuracy with which it can be deployed. But it cannot be sensibly described objectively correct or incorrect.

On the Network Conception of objecthood, objects are in some ways analogous to units of measurement. Selecting a domain of reference is not a matter of choosing from a bucket of metaphysically distinguished entities. It is a matter of setting up a *system* for comparing ways for the world to be. A referential domain, like a unit of measurement, is ultimately parochial: it can be sensibly described as practical or impractical, but not as objectively correct or incorrect. But a parochial domain of reference, like a parochial unit of measurement, can be used to give an objectively correct description of the way the world is.

6 Ways for the world to be

On the Network Conception, the notion of a *way for the world to be* is coarse-grained, in the following sense:

Coarse-Grainedness Let F and G be ways for the world to be and suppose that every metaphysically possible world instantiates both or neither. Then $F = G$.

This principle entails that a way for the world to be can be adequately modeled as a set of metaphysically possible worlds. It also entails that a way for the world to be can be described, fully and accurately, using distinct syntactic structures. Notice, for example, that each of the following is true:

- "Socrates died" is a full and accurate description of [Socrates died]
- "Socrates's death occurred" is a full and accurate description of [Socrates's death occurred]

where [ϕ] be the way for the world to be that is instantiated if and only if ϕ.

Since, necessarily, Socrates died if and only if his death occurred, Coarse-Grainedness entails:

- [Socrates died] = [Socrates's death occurred]

It follows that "Socrates died" and "Socrates's death occurred" are full and accurate descriptions of single way for the world to be. Following Frege, one might put the point in the material mode, albeit metaphorically, by saying that a single way for the world to be can be "carved up" into objects and properties in different ways. On one such carving, [Sorcates died] is divided into Socrates and the property of having died; on another, it is divided into the event of Socrates's death and the property of having taken place.

7 Connections

Earlier I suggested that adopting a unit of length consists in adopting a system for comparing the lengths of different objects. Along similar lines, a friend of the Network Conception thinks that fixing the referents of one's predicates and singular terms consists in adopting a system for comparing different ways for the world to be.

In order to make this idea more pricese, it is useful to start with an example. Consider a particular way for the world to be: [Socrates died]. Since Socrates, in fact, died, [Socrates died] is not just a way for the world to be: it is a *feature of reality*. Now suppose you wish to improve someone's understanding this feature of reality. How might you proceed?

A primitive strategy is to let the world speak for itself. Assuming your interlocutor is able to pick out the relevant feature of reality, you might simply point towards the world and exclaim "behold!", leaving your interlocutor to decide how to organize the information she receives. A more sophisticated strategy is to help your interlocutor identify specific connections between

[Socrates died] and other ways for the world to be. You could, for instance, highlight the following connections:

[Socrates died]		[Hypatia died]		[Aristophanes died]
relates to		*relates to*		*relates to*
[Socrates is wise]	*as*	[Hypatia is wise]	*and as*	[Aristophanes is wise]
and		*and*		*and*
[Socrates argues]		[Hypatia argues]		[Aristophanes argues]

[Socrates died]		[Socrates is wise]		[Socrates argues]
relates to		*relates to*		*relates to*
[Hypatia died]	*as*	[Hypatia is wise]	*and as*	[Hypatia argues]
and		*and*		*and*
[Aristophanes died]		[Aristophanes is wise]		[Aristophanes argues]

This more sophisticated strategy allows your interlocutor to focus on aspects of [Socrates died] that you take to be especially worthy of attention. The network of connections above the horizontal line helps her focus on Socrates; the network below the line helps her focus on the property of having died.

But a friend of the Network Conception thinks there are additional aspects of [Socrates died] that might be rendered salient. She thinks, for example, that one might rely on the fact that [Socrates died] = [Socrates's death took place] to highlight the following connections:

[Socrates died]		[the Symposium occurred]		[WWII occurred]
relates to		*relates to*		*relates to*
[Socrates's death saved Athens' youth]	*as*	[the Symposium saved Athens' youth]	*and as*	[WWII saved Athens' youth]
and		*and*		*and*
[Socrates's death was tragic]		[the Symposium was tragic]		[WWII was tragic]

[Socrates died]		[Socrates's death saved Athens' youth]		[Socrates's death was tragic]
relates to		*relates to*		*relates to*
[the Symposium occurred]	*as*	[the Symposium saved Athens' youth]	*and as*	[the Symposium was tragic]
and		*and*		*and*
[WWII occurred]		[WWII saved Athens' youth]		[WWII was tragic]

As before, these connections allow your interlocutor focus on aspects of [Socrates died] that you take to be especially worthy of attention. The network of connections above the horizontal line helps her focus on Socrates's death, and the network below the line helps her focus on the property of having occurred.

Different networks of connections can be used to highlight different aspects of a way for the world to be. But, on the Network Conception, there is no such thing as a "metaphysically privileged" aspect of a way for the world to be: an aspect that can be rendered salient on the basis of purely metaphysical considerations. A network of connections may be practical or impractical. But, on the Network Conception, there is no sense to be made of the idea that it carves nature at the joints.

8 Language-Based Networks

A compositional language can have an important role to play in specifying a network of connections between ways for the world to be.

Recall from §1 that an interpretation $[\![\ldots]\!]$ of L is a function that assigns to each sentence of L a *coarse-grained* proposition. Since coarse-grained propositions can be modeled as sets of possible worlds, and since a proponent of the Network Conception thinks that ways for the world to be can also be modeled as sets of possible worlds, she thinks it is harmless to treat $[\![\phi]\!]$ as a way for the world to be. She is therefore in a position to see the following schemas as determining a network of relations between ways for the world to be, relative to a choice of $[\![\ldots]\!]$:

(Basic Schema I) $\quad \begin{array}{c} [\![\ulcorner P(c) \urcorner]\!] \\ \textit{relates to} \\ [\![\ulcorner Q(c) \urcorner]\!] \end{array} \quad \text{as} \quad \begin{array}{c} [\![\ulcorner P(d) \urcorner]\!] \\ \textit{relates to} \\ [\![\ulcorner Q(d) \urcorner]\!] \end{array}$

(Basic Schema II) $\quad \begin{array}{c} [\![\ulcorner P(c) \urcorner]\!] \\ \textit{relates to} \\ [\![\ulcorner P(d) \urcorner]\!] \end{array} \quad \text{as} \quad \begin{array}{c} [\![\ulcorner Q(c) \urcorner]\!] \\ \textit{relates to} \\ [\![\ulcorner Q(d) \urcorner]\!] \end{array}$

where the coarse-grained propositions $[\![\ulcorner \exists x(x = c) \urcorner]\!]$ and $[\![\ulcorner \exists x(x = d) \urcorner]\!]$ are both true.

Each of our Basic Schemas uses a *syntactic* connections between sentences—the sharing of a singular term, or the sharing of a predicate—to highlight a connection between the ways for the world to be that $[\![\ldots]\!]$ assigns to those sentences. Suppose, for example, that $[\![\ldots]\!]$ such that

$$\begin{array}{lclclclclcl} [\![\text{“}D(s)\text{”}]\!] & = & \text{[Socrates died]} & [\![\text{“}D(h)\text{”}]\!] & = & \text{[Hypatia died]} & [\![\text{“}D(a)\text{”}]\!] & = & \text{[Aristophanes died]} \\ [\![\text{“}W(s)\text{”}]\!] & = & \text{[Socrates is wise]} & [\![\text{“}W(h)\text{”}]\!] & = & \text{[Hypatia is wise]} & [\![\text{“}W(a)\text{”}]\!] & = & \text{[Aristophanes is wise]} \\ [\![\text{“}A(s)\text{”}]\!] & = & \text{[Socrates argues]} & [\![\text{“}A(h)\text{”}]\!] & = & \text{[Hypatia argues]} & [\![\text{“}A(a)\text{”}]\!] & = & \text{[Aristophanes argues]} \end{array}$$

Then the Basic Schemas deliver the first pair of networks we considered in §7. In particular, Basic Schema I uses the observation that “$D(s)$” and “$W(s)$” share a singular term, and that “$D(h)$” and “$W(h)$” share a singular term, to establish the following connection between ways for the world to be:

$$\begin{array}{ccc} \text{[Socrates died]} & & \text{[Hypatia died]} \\ \textit{relates to} & \textit{as} & \textit{relates to} \\ \text{[Socrates is wise]} & & \text{[Hypatia is wise]} \end{array}$$

And, of course, this is not the only way in which the Basic Schemas might be deployed. They deliver the second pair of networks of §7 when $[\![\ldots]\!]$ is such that:

$$\begin{array}{lclclclclcl} [\![\text{“}O(d)\text{”}]\!] & = & \left[\text{Socrates died}\right] & [\![\text{“}O(m)\text{”}]\!] & = & \left[\begin{array}{l}\text{the Symposium}\\\text{occurred}\end{array}\right] & [\![\text{“}O(w)\text{”}]\!] & = & \left[\text{WWII occurred}\right] \\ [\![\text{“}S(d)\text{”}]\!] & = & \left[\begin{array}{l}\text{Socrates's death}\\\text{saved Athens'}\\\text{youth}\end{array}\right] & [\![\text{“}S(m)\text{”}]\!] & = & \left[\begin{array}{l}\text{the Symposium}\\\text{saved Athens'}\\\text{youth}\end{array}\right] & [\![\text{“}S(w)\text{”}]\!] & = & \left[\begin{array}{l}\text{WWII saved}\\\text{Athens' youth}\end{array}\right] \\ [\![\text{“}T(d)\text{”}]\!] & = & \left[\begin{array}{l}\text{Socrates's death}\\\text{was tragic}\end{array}\right] & [\![\text{“}T(m)\text{”}]\!] & = & \left[\begin{array}{l}\text{the Symposium}\\\text{was tragic}\end{array}\right] & [\![\text{“}T(w\text{”}]\!] & = & \left[\text{WWII was tragic}\right] \end{array}$$

Notice, moreover, that $[\![\ldots]\!]$ can satisfy both sets of constraints at the same time. And, if it does, the Basic Schemas will deliver both pairs of connection-networks.

“But which use of the Basic Schemas is *objectively correct*?”—our critic might wonder—“Which one delivers the metaphysically privileged network of connections?”. On the Network Conception, these questions are misguided. It is certainly true that there are better and worse uses of the Basic Schemas. But they are better or worse only in a *practical* sense. On a good choice of language and interpretation, the Schemas deliver a network of connections that is helpful, by our own lights, as a tool for navigating the world; on a bad choice of language and interpretation, they deliver a network that is less helpful.

9 What is an object?

On the Network Conception, an object is an *aspect* of a way for the world to be—an aspect that might be rendered salient by a network of connections between ways for the world to be.

Unfortunately, this description of the view is open to a certain kind of misunderstanding. For, on the Network Conception, it would be a serious mistake to think that the various aspects of a way for the world to be can be singled out independently of a system of connections with other ways for the world to be. (A way for the world to be is not a "bucket of aspects".)

The best way of steering clear of this misunderstanding is to think of an object as a *node* in a network of connections between ways for the world to be. This makes it easy to see why it would be a mistake to suppose that a given feature of reality can be divided into "aspects" independently of a system of connections. For just like there is no sense to be made of the intersection between two roads independently of the roads themselves, there is no sense to be made of a node in a network of connections independently of the connections themselves.

An important consequence of this way of thinking is that the notion of object is *language relative*. It is only against the background of a language—or, more generally, against the background of a network of connections between ways for the world to be—that there is sense to be made of a domain of objects. For the objects are just that network's nodes: they are just aspects of ways for the world to be that are rendered salient by the network's connections.

The Network Conception's account of properties runs parallel to its account of objects. Like an object, a property is an aspect of a way for the world to be: an aspect that can be rendered salient by a network of connections within a family of ways for the world to be. The difference between objects and properties is not a difference of "metaphysical character": no criterion based on purely metaphysical considerations could be used to distinguish between an object and a property. Objects and properties are both nodes in a network of connections: an object is a node centered around a singular term; a property is a node centered around a predicate. One can distinguish between objects and properties by using singular terms to refer to the former and predicates to refer to the latter. But there is no way of carrying out such a distinction independently of a language-generated network of connections between ways for the world to be.[11]

10 Expanding the Network

In §8 we saw that the Basic Schemas allow one to use the syntax of an interpreted language to establish a network of connections between ways for the world to be—connections that help draw attention to particular aspects of the relevant ways for the world to be. In the present section we shall see that that network can be extended to a broader one that encompasses every way for the world to $[\![\phi]\!]$, for ϕ a sentence of the language.

Notice, first, that one can define Boolean operations on ways for the worlds to be:

Boolean Operations Let $p_1, p_2, \ldots$ be ways for the world to be. Then:

- $\cap\{p_1, p_2, \ldots\}$ is *such that the world is* p_1 *and* p_2 *and* $\ldots$ (i.e. the way for the world to be that conjoins $p_1, p_2, \ldots$).
- $\cup\{p_1, p_2, \ldots\}$ is *such that the world is* p_1 *or* p_2 *or* $\ldots$ (i.e. the way for the world to be that disjoins $p_1, p_2, \ldots$).
- $\sim p_k$ is *such that the world is not* p_k (i.e. the way for the world to be that complements p_k).

In addition, one can characterize a *mereology* of ways for the world to be:

Parthood Let p and q be ways for the world to be. Then p is *part of* q (in symbols: $p \prec q$) if and only if $q = \cap\{p, q\}$.

When Coarse-Grainedness is in place, $\cap, \cup, \sim$ deliver a Boolean Algebra on the space of ways for the world to be, and $\prec$ delivers partial ordering. (Notice, in particular, that $p \prec q$ holds whenever the set of possible worlds that models p is a superset of the set of possible worlds that models q, so $p \prec q$ and $q \prec p$ together entail $p = q$.)

This guarantees the following, for any $[\![\ldots]\!]$ that preserves logical entailments:[12]

If $\phi \models \psi$, then $[\![\psi]\!] \prec [\![\phi]\!]$.

[11] For discussion of a closely related issue, see Trueman 2014 and Jones 2016.

[12] More generally: if $\Phi \models \Psi$, $\cup\{[\![\psi]\!] : \psi \in \Psi\} \prec \cap\{[\![\phi]\!] : \phi \in \Phi\}$ (Φ and Ψ non-empty).

and therefore:[13]

1. $[\![\ulcorner\phi \wedge \psi\urcorner]\!] = \cap\{[\![\phi]\!], [\![\psi]\!]\}$;
2. $[\![\ulcorner\phi \vee \psi\urcorner]\!] = \cup\{[\![\phi]\!], [\![\psi]\!]\}$;
3. $[\![\ulcorner\neg\phi\urcorner]\!] = \sim[\![\phi]\!]$;
4. $[\![\ulcorner\exists x\ \Theta(x)\urcorner]\!] \prec\ \cap\{[\![\ulcorner\Theta(t)\urcorner]\!], [\![\ulcorner\exists x(x=t)\urcorner]\!]\}$;[14]
5. $[\![\ulcorner\Theta(t)\urcorner]\!] \prec\ \cap\{[\![\ulcorner\forall x\ \Theta(x)\urcorner]\!], [\![\ulcorner\exists x(x=t)\urcorner]\!]\}$.

These algebraic and mereological connections between ways for the world to be can be used to extend the initial network of connections that the Basic Schemas deliver. Recall that on the Network Conception an object is an aspect of a way for the world to be that is rendered salient by a singular term, and recall that a property is an aspect of a way for the world to be that is rendered salient by a predicate. Let us restrict attention to aspects of these two kinds and assume that such aspects are preserved by parthood, in the following sense:

> If p is part of q, any aspect of p is also an aspect of q.

Then the fact that $[\![\ldots]\!]$ preserves logical entailments gives us:

> If $\phi \models \psi$, then any aspect of $[\![\psi]\!]$ is also an aspect of $[\![\phi]\!]$.

And therefore:

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[13] These results follow from the soundness of the corresponding introduction and elimination rules, together with External Validation, which is proved in §12.

[14] Actually, one can prove something stronger, corresponding to the introduction and elimination rules for the existential quantifier in a negative free logic:

4_i.

$$\frac{\cap\{[\![\gamma]\!] : \gamma \in \Gamma\}}{\cap\{[\![\ulcorner\Phi(t)\urcorner]\!], [\![\ulcorner\exists x(x=t)\urcorner]\!]\}} \rightarrow \frac{\cap\{[\![\gamma]\!] : \gamma \in \Gamma\}}{[\![\ulcorner\exists x\ \Theta(x)\urcorner]\!]}$$

4_e.

$$\frac{\cap\{\cap\{[\![\gamma]\!] : \gamma \in \Gamma\}, \cap\{[\![\ulcorner\Theta(t)\urcorner]\!], [\![\ulcorner\exists x(x=t)\urcorner]\!]\}\}}{[\![\phi]\!]} \rightarrow \frac{\cap\{\cap\{[\![\gamma]\!] : \gamma \in \Gamma\}, [\![\ulcorner\exists x\ \Theta(x)\urcorner]\!]\}}{[\![\phi]\!]}$$

where t is a closed term, p/q is used in place of $q \prec p$ and, in $4e$, t does not occur in ϕ or any member of Γ. (And, of course, dual results can be proved for the universal quantifier.)

1′. Any aspect of $[\![\phi]\!]$ or $[\![\psi]\!]$ is also an aspect of $[\![\ulcorner \phi \wedge \psi \urcorner]\!]$.

2′. Any aspect of $[\![\phi]\!]$ or $[\![\psi]\!]$ is also an aspect of some way for the world to be that is a way of instantiating $[\![\ulcorner \phi \vee \psi \urcorner]\!]$.

3′. Any aspect of $[\![\phi]\!]$ is also an aspect of any way for the world to be that is incompatible with an instantiation of $[\![\ulcorner \neg\phi \urcorner]\!]$.

4′. If $[\![\ulcorner \exists x(x = t) \urcorner]\!]$ is instantiated, any aspect of $[\![\ulcorner \exists x\ \Theta(x) \urcorner]\!]$ is also an aspect of $[\![\ulcorner \Theta(t) \urcorner]\!]$.

5′. If $[\![\ulcorner \exists x(x = t) \urcorner]\!]$ is instantiated, any aspect of $[\![\ulcorner \Theta(t) \urcorner]\!]$ is also an aspect of $[\![\ulcorner \forall x\ \Theta(x) \urcorner]\!]$.

This means that an entailment-preserving interpretation can be used to generate a network of connections between the members of a family of ways for the world to be that includes $[\![\phi]\!]$ for any object-language sentence ϕ. When ϕ is an atomic sentence, $[\![\phi]\!]$ enters the network by way of the Basic Schemas of §8; when ϕ is an complex sentence, $[\![\phi]\!]$ enters the network by way of algebraic and mereological connections between ways for the world to be.

11 Conceptualization

The networks of connections we have been considering are exceedingly complex. Fortunately, there is a nice way of organizing our understanding of them in the special case in which the object-language, L, is a sublanguage of our metalanguage. For, in that special case, we can set forth a *homophonic* semantics for L.[15]

[15] Assuming, for simplicity that L is a first-order language with no function letters or predicates of arity higher than one, we can do so by stipulating that the new expressions "Ref", "App", and "Sat" are to be used so as to verify each of the following statements:

- $\forall x(\text{App}(\text{“}\xi\text{”}, x) \leftrightarrow \xi(x))$
  (where both occurrences of "ξ" are replaced by an atomic predicate of L)
- $(\exists x(x = \alpha) \to \text{Ref}(\text{“}\alpha\text{”}, \sigma, \alpha)) \ \wedge\ (\neg\exists x(x = \alpha) \to \forall x \neg \text{Ref}(\text{“}\alpha\text{”}, \sigma, x))$
  (where all five occurrences of "α" are replaced by an individual constant of L)
- $\forall v(\text{Variable}(v) \to \text{Ref}(v, \sigma, \sigma(v)))$
- $\forall P \forall t(\text{Predicate}(P) \wedge \text{Term}(t) \to (\text{Sat}(\ulcorner P(t) \urcorner, \sigma) \leftrightarrow \exists x(\text{Ref}(t, \sigma, x) \wedge \text{App}(P, x))))$

The goal of setting forth a homophonic semantics is not to fix the meanings of the subsentential expressions of L. That would be pointless, since a homophonic semantics *uses* the subsentential expressions of L and is therefore only intelligible on the assumption that such expressons are meaningful to begin with. The goal is, rather, to clarify the relationship between the syntactic structure of a sentence of L and its truth-conditions. With respect to this second project, a homophonic semantics is decidedly helpful. For it delivers a recursive procedure for assigning semantic values to the subsentential expressions of L and using them to derive the truth-conditions of every sentence of L.

The homophonic assignment of semantic values to subsentential expressions of L gives us a simple and elegant way of organizing our understanding of the vast network of connections between ways for the world to be that one gets from $[\![\ldots]\!]$. Specifically, it allows us: (*i*) to think of the variables of L as ranging over a domain of objects, (*ii*) to think of the (non-empty) names of L as referring to objects in this domain, (*iii*) to think of the predicates of L as expressing properties that apply to objects in the domain, (*iv*) to think of atomic sentences as expressing the ascription of such properties to objects in the domain, and (*v*) to think of non-atomic sentences as expressing the result of applying iterated logical operations to such ascriptions. In short: a homophonic semantics allows us to organize our understanding of the network of connections by thinking of $[\![\ldots]\!]$ as generated from a domain of objects.

To *conceptualize* a way for the world to be is to think of it as articulated into distinct components. A homophonic semantics allows us to conceptualize $[\![\phi]\!]$ by articulating it into the semantic values of ϕ's subsentential expressions in a way that reflects the syntactic structure of ϕ. For instance, it allows us to articulate $[\![$“Socrates died”$]\!]$ into Socrates and the property of having died.

A single way for the world to be might admit of different conceptualizations. Whenever we have $[\![\phi]\!] = [\![\psi]\!]$ for ϕ and ψ of different syntactic structures, a homophonic semantics can be used to conceptualize $[\![\phi]\!]$ in different ways, one corresponding to ϕ's syntactic structure and the other correspond-

- $\forall\phi\forall\psi(\text{Formula}(\phi) \wedge \text{Formula}(\psi) \rightarrow (\text{Sat}(\ulcorner\phi \wedge \psi\urcorner, \sigma) \leftrightarrow (\text{Sat}(\phi, \sigma) \wedge \text{Sat}(\psi, \sigma))))$
- $\forall\phi(\text{Formula}(\phi) \rightarrow (\text{Sat}(\ulcorner\neg\phi\urcorner, \sigma) \leftrightarrow (\neg\text{Sat}(\phi, \sigma))))$
- $\forall\phi\forall v(\text{Formula}(\phi) \wedge \text{Variable}(v) \rightarrow (\text{Sat}(\ulcorner\exists v\ \phi\urcorner, \sigma) \leftrightarrow \text{Sat}(\phi, \sigma[x/v])))$

where σ is a variable assignment and $\sigma[x/v]$ is a variable assignment that assigns x to v and is otherwise like σ.

ing to ψ's. This gives us a version of Frege's idea that there can be multiple "carvings" of a single way for the world to be. And, importantly, it does so while steering clear of the idea that a way for the world to be is endowed with a "bucket" of components, which are rendered salient as potential referents on purely metaphysical grounds.

From the perspective of the Bucket View, the idea that one could use a homophonic semantics to come to a domain-based understanding of L is just as bankrupt as the idea that one could verify the accuracy of one's morning newspaper by buying a second copy. For unless the sub-sentential expressions of L are genuinely referential to begin with (in virtue of being paired with suitable items in the bucket), a homophonic semantics (which uses those very expressions in providing its specification of reference) won't change the fact that the sub-sentential expressions of L are not genuinely referential.

It is important to keep in mind that such a complaint is no threat to the present picture. On the Network Conception, genuine reference is not a matter of pairing the sub-sentential expressions of L with items in a bucket. All it takes for a term to be genuinely referential is for it to play the right sort of role in a suitable specification of connections between ways for the world to be.

12 The External Perspective

In the preceding section we considered an *internal* question: whether a speaker could use a homophonic semantics to come to a domain-based understanding of the network of connections generated by (a fragment of) her own language. In this section we will consider the corresponding *external* question: whether a theorist could come to a domain-based understanding of the network of connections generated by some language other than her own.

The external question can be answered by appeal to a simple formal result. Say that an interpretation $[\![\ldots]\!]$ is *normal* if it preserves logical entailments and treats identity statements as non-contingent.[16] Say that an interpretation $[\![\ldots]\!]$ has a model $\mathcal{K}$ just in case $\mathcal{K}$ is a Kripke-model and $w \models_{\mathcal{K}} \phi$ iff $w \in [\![\phi]\!]$ for any world w and sentence ϕ. It is then easy to

[16]Preservation of logical entailments is defined in footnote 4. For $[\![\ldots]\!]$ to treat identify statements as non-contingent if for it to be the case that $[\![\ulcorner \exists x(x = t) \to t = t' \urcorner]\!]$ is $\top$ or $\bot$ whenever t and t' are closed singular terms.

prove:[17]

External Validation All and only normal interpretations have models.

An immediate consequence of this result is that any normal interpretation can be generated compositionally, by assigning semantic values to basic lexical items of the language and using them to assign truth-conditions to sentences in a systematic way. Not just that: any normal interpretation can be generated *in a domain based way*, by taking quantifiers to range over the the objects in a domain, names to refer to objects in that domain, and so forth.

A normal interpretation will typically have many different models. Consider, for example, our interpretation $[\![\ldots]\!]^{\mathbb{N}}$ of the language of first-order arithmetic (§1). Since $[\![\ldots]\!]^{\mathbb{N}}$ is a normal interpretation, it has models. But any permutation of such a model will also be a model of $[\![\ldots]\!]^{\mathbb{N}}$. And, by the Löwenheim–Skolem Theorem, $[\![\ldots]\!]^{\mathbb{N}}$ has models with domains of any infinite size.

A critic might see this as a problem for the Network Conception. "Which of the many models of $[\![\ldots]\!]^{\mathbb{N}}$ corresponds to the conceptualization that a speaker of the language of arithmetic would get by using a homophonic semantics?"—she might ask—"Unless additional constraints are brought into

[17] *Proof sketch:* Here's how to build a Kripke-model $\mathcal{K}$ for a normal interpretation $[\![\ldots]\!]$. For w a possible world, let $T_w = \{\phi \in L : w \in [\![\phi]\!]\}$. Since $[\![\ldots]\!]$ preserves logical entailments, T_w must be non-empty. (Since $\{\} \models \{\phi, \ulcorner\neg\phi\urcorner\}$, every world is in $[\![\phi]\!] \cup [\![\ulcorner\neg\phi\urcorner]\!]$ so w is in either $[\![\phi]\!]$ or $[\![\ulcorner\neg\phi\urcorner]\!]$.) In addition, T_w must be model-theortically consistent. (Suppose otherwise. Then $T_w \models \{\}$. But since $[\![\ldots]\!]$ preserves logical entailments, this means that $\bigcap\{[\![\phi]\!] : \phi \in T_w\} = \emptyset$, contradicting the fact that T_w is non-empty and $w \in [\![\phi]\!]$ for every $\phi \in T_w$.) Since T_w is model-theoretically consistent, it has a (standard, set-theoretic) model $\mathcal{M}_w$ with the following two features: (1) $w \in [\![\phi]\!]$ iff $\mathcal{M}_w \models \phi$ (ϕ a sentence of L), and (2) if $w \in [\![\ulcorner\exists x(x = t)\urcorner]\!]$, the denotation of t according to $\mathcal{M}_w$ is $\{t' : w \in [\![\ulcorner t = t'\urcorner]\!]\}$ (t, t' closed terms). Notice, moreover, that since $[\![\ldots]\!]$ treats identity statements as non-contingent, (2) guarantees that $\mathcal{M}_w$ and $\mathcal{M}_{w'}$ will assign the same denotation to t whenever $w, w' \in [\![\ulcorner\exists x(x = t)\urcorner]\!]$. Our Kripke model $\mathcal{K}$ can then be defined by using $\mathcal{M}_w$ to represent each world w.

We still need to verify that non-normal interpretations have no model. But if $[\![\ldots]\!]$ fails to preserve logical entailments, there is a (model-thoeretically) inconsistent set Φ such that for some world w, $w \in [\![\phi]\!]$ for every $\phi \in \Phi$. Since Φ is inconsistent, it has no model. So there is no Kripke-model $\mathcal{K}$ such that $w \models_{\mathcal{K}} \phi \leftrightarrow w \in [\![\phi]\!]$ for every ϕ in Φ. And if $[\![\ldots]\!]$ fails to treat identity statements as non-contingent, L has closed terms t and t' such that $[\![\ulcorner\exists(x = t) \rightarrow t = t'\urcorner]\!]$ contains some worlds but not others, which means that one couldn't construct a Kripke-model for $[\![\ldots]\!]$ assigns t and t' the same referent at every world.

the picture, the Network Conception's conceptualizations are subject to rampant indeterminacy. Why, they don't even determine the *cardinality* of the language's domain, to say nothing of the domain's contents!"

When considered against the background of the Bucket View, the complaint has force. More specifically, the existence of different models for $[\![\ldots]\!]^{\mathbb{N}}$ is evidence of referential indeterminacy because it suggests that a homophonic conceptualization fails to determine which elements of the bucket are to be included within the range of the quantifiers.

From the point of view of the Network Conception, however, the complaint misfires. As noted in §9, a friend of the Network Conception takes the notion of an object to be language-relative. For although she believes that there is an objective fact of the matter about how the world is, she also individuates ways for the world to be in coarse-grained terms. Accordingly, she believes that our notion of object only makes sense against the background of the conceptualization of ways for the world to be that our language delivers. As a result, she thinks that there is no such thing as a "neutral" conception of object with respect to which one might ask the question of which objects fall within the range of the quantifiers of a given language. The best one can do is use the notion of object that results from one conceptualization to shed light on the notion of object that results from another.

Suppose, for example, that our object-language is the language of first-order arithmetic, $L^{\mathbb{N}}$, as interpreted by $[\![\ldots]\!]^{\mathbb{N}}$, and that our metalanguage is the language of first-order set-theory. When working from such a perspective, one may find that there are distinct but equally acceptable assignments of a set-theoretic range to $L^{\mathbb{N}}$'s quantifiers and a set-theoretic referent to each of $L^{\mathbb{N}}$'s singular terms. But it would be tendentious to go on to conclude that $L^{\mathbb{N}}$ suffers from referential indeterminacy. For, on the Network Conception, the conceptualization delivered by the language of set-theory has no special status: it is not a bucket from which the referents of arithmetical terms ought to be selected. Recall that on the Network Conception what is required for a term to be referential is not that it be paired with an item from a suitable bucket. It is for the term to play the right sort of role in a suitable specification of connections between ways for the world to be.

For a friend of the Network Conception, the fact that there are multiple set-theoretic interpretations of the language of arithmetic is simply a special case of the fact that there can be multiple conceptualizations of a single way for the world to be. A speaker of the language of arithmetic is in a position to use a homophonic semantics to conceptualize $\top$ in one way; a speaker of the language of set-theory is in a position to use each set-theoretic model of $[\![\ldots]\!]^{\mathbb{N}}$ to conceptualize $\top$ in a different way. None of these conceptualizations is privileged. They correspond to different ways of organizing one's understanding of a network of connections between ways for the world to be.[18]

13 Motivating the Ultra-Thin Conception

Consider a version of the Ultra-Thin Conception of reference that has been modified in two ways: (1) we restrict attention to languages that are sublanguages of the language we speak, and (2) we insist on interpretations that not only preserve logical entailments but are also normal. In other words:

The Ultra-Thin Conception of Reference (Revised Version) Let L be a sublanguage of the language I am now speaking, let c be a singlar term of L, and let $[\![\ldots]\!]$ be an interpretation of L. The following conditions are jointly sufficient for c to refer, as interpreted by $[\![\ldots]\!]$:

1. $[\![\ldots]\!]$ is normal (i.e. it preserves logical entailments and treats identity statements as non-contingent);
2. $[\![\ulcorner \exists x(x = c) \urcorner]\!]$ is a true (coarse-grained) proposition.

So revised, the Ultra-Thin Conception of reference is a consequence of the Network Conception of objecthood. For suppose that L is a sublanguage of the language we speak and that $[\![\ldots]\!]$ is a normal interpretation of L. As we saw in §8 and §10, a friend of the Network Conception thinks that $[\![\ldots]\!]$ can be used to generate a network of connections between the members of a

[18] I have argued that a friend of the Network Conception would resist the conclusion that the language of arithmetic suffers from referential indeterminacy, as interpreted by $[\![\ldots]\!]^{\mathbb{N}}$. But I do not wish to suggest that the Network Conception rules out referential indeterminacy altogether. Such indeterminacy can result from indeterminacy in the propositions that one's interpretation of the language assigns to *sentences*. Suppose, for instance, that it is indeterminate whether $[\![$"Mt. Everest is tall"$]\!]$ is $\{w : \text{ at } w, \text{Everest is tall}\}$ or $\{w : \text{ at } w, \text{Kilimanjaro is tall}\}$. Then "Mt. Everest" will certainly suffer from referential indeterminacy, since it will be indeterminate which network of connections between ways for the world to be is specified by $[\![\ldots]\!]$. But a friend of the Network Conception thinks that there can be no lingering referential indeterminacy once one has succeeded in eliminating indeterminacy from $[\![\ldots]\!]$.

family that includes every way for the world to be $[\![\phi]\!]$, for ϕ a sentence of L. And as we saw in §12, the fact that $[\![\ldots]\!]$ is normal guarantees that it can be generated in a domain based way. Finally, as we saw in §11, we can take advantage of this fact to conceptualize each $[\![\phi]\!]$ in a domain-based way, and thereby organize our understanding of the underlying network of connections. When we rely on this conceptualization, we accept $\ulcorner [\![$"$\exists x(x = c)$"$]\!]$ is true iff $\exists x(x = c)\urcorner$. So we take c to be non-empty if and only if $[\![\ulcorner \exists x(x = c)\urcorner]\!]$ is a true (coarse-grained) proposition, just as the Ultra-Thin Conception requires.

Notice, moreover, that the Network Conception of objecthood can be used to motive the existence of thin objects, in Linnebo's sense. Let L be the language of arithmetic as interpreted by $[\![\ldots]\!]^{\mathbb{N}}$ and suppose it is a sublanguage of the language we speak. We can use an (intensional) homophonic semantics for L to show that 0 exists at a possible world w if and only if $w \in [\![$"$\exists x(x = 0)$"$]\!]$. Since $[\![$"$\exists x(x = 0)$"$]\!] = \top$, it follows that 0 exists at any world. But, on the Network Conception, a possible world is just a maximally specific way for the world to be. So 0 will exist however the world is. So 0's existence makes no substantial demands on the way the world is, just as Linnebo requires.

14 Linnebo's Critique

As I noted in §2, Linnebo thinks that "ultra-thin conceptions are unacceptably liberal in their ascription of reference" (p. 93). In this section I will describe his arguments for this conclusion and explain how a friend of the Network Conception might respond to them.

Linnebo's first argument is based on the observation that the Ultra-Thin Conception allows for reference even in the case of *holophrastic* interpretations: interpretations on which "each sentence is assigned a meaning only as a whole, not in virtue of any meanings assigned to its subsentential expressions" (p. 91). (One example of such an interpretation is $[\![\ldots]\!]^{\mathbb{N}}$.) Linnebo worries that on a holophrastic interpretation "there is no direct interaction between the syntactic structure of a sentence and its semantic interpretation" (p. 91), and that this makes singular terms "semantically idle". More specifically, he worries that

> [a holophrastic interpretation] completely shortcuts the principle of compositionality, which tells us that the meaning of ϕ is

> obtained in a systematic way from the meanings of its simple constituents. While holophrastic reductionism justifies a *façon de parler*, it thus fails to ensure genuine reference. (p. 91–2)

Notice, however, that the Ultra-Thin Conception's requirement that logical entailments be preserved is stronger than it looks. As we saw in §12, any normal interrpretation can be generated compositionally, by assigning semantic values to basic lexical items and using them to assign truth-conditions to sentences in a systematic way.

It is tempting to respond by suggesting that speakers may not be in a position to *recognize* the possibility of giving a compositionally generated interpretation of the language, and claiming that such speakers end up *using* the language's singular terms in a way that is not genuinely referential. From the point of view of the Network Conception, this is not a genuine concern. For, as we saw in §11, our speakers will always be in a position to use a homophonic semantics to see how her language's interpretation could be generated in a compositional (and, indeed, domain-based) way.

A critic might retort that a homophonic semantics could never succeed in getting a term to be used referentially. "Either the term refers from the start or it doesn't: if it does, a homophonic semantics is unnecessary; if it doesn't, a homophonic semantics won't help." A friend of the Network Conception concedes that the objection has force from the perspective of the Bucket View. But she rejects the Bucket View. She thinks that all it takes for a term to refer is for it to play the right sort of role in in generating a network of connections between ways for the world to be.

"That's not genuine reference!"—our critic might cry out in exasperation—"A term can't refer unless it refers to an object that is really *out there*"—[table thump]—"out there in the world!" Such a complaint would beg the question. On the Network Conception, all it takes for Mt. Everest to be out there—for it to *really* be out there, in the world—is for $[\![$"$\exists x(x = \text{Mt. Everest})$"$]\!]$ to be a true coarse-grained proposition. Compare: It is objectively true—true in the strictest sense—that my desk is $2m$ long ($\pm 1\%$), and this is so in spite of the fact that a characterization of the relevant feature of the world in terms of meters (as opposed to, say, feet) is ultimately parochial. Similarly, it is objectively true—true in the strictest sense—that Mt. Everest exists, and this is so in spite of the fact that a conceptualization of the relevant feature of the world that involves Mt. Everest (as opposed to, say, particles arranged Everestly, or the property of Everesting) is ultimately parochial.

Linnebo's second argument is based on the thought that the Ultra-Thin Conception gives rise to "inexplicable" relations of reference. Let Σ be the first-order theory of dense linear orders without end points and consider the following interpretation of its language, L^{Σ}:

$$[\![\phi]\!]^{\Sigma} = \begin{cases} \top, & \text{if } \Sigma \vdash \phi \\ \bot, & \text{if } \Sigma \vdash \ulcorner \neg\phi \urcorner \end{cases}$$

Now suppose that L^{Σ} has been enriched with a new constant c, and that $\Sigma \vdash$ "$\exists x(x = c)$". As Linnebo points out, Σ is complete and consistent. Since it is complete, $[\![\ldots]\!]^{\Sigma}$ assigns a proposition to every sentence of the language; since it is consistent, the Ultra-Thin Conception entails that c is genuinely referential. Linnebo then asks:[19]

> To which of the infinitely many objects standing in [a dense linear ordering] does c refer? Absolutely nothing distinguishes one of the potential referents from any of the others. So there is absolutely no reason why c should refer to one of the objects rather than some other! This would be a brute and inexplicable relation of reference. (p. 93)

When L^{Σ} is a sublanguage of our own, we can answer Linnebo's question homophonically, by asserting $\ulcorner$"c" refers to $c\urcorner$. Now suppose a critic replies: $\ulcorner$Yes, but *why* does "c" refer to c?$\urcorner$. On the Network Conception, this is a bit like asking why two roads have *this* intersection rather than some other one. If intersections were items in a bucket waiting to be assigned to roads, one could certainly make sense of such a question. But that's not how intersections work. Once two roads are built so as to intersect, nothing further is required to determine which intersection it is that the roads share: their intersection is just the area of overlap. Similarly, a friend of the Network Conception thinks that once $[\![\ldots]\!]^{\Sigma}$ is used to build a suitable network of connections between ways for the world to be, and once the world is such as to satisfy the (coarse-grained) proposition that $[\![\ldots]\!]^{\Sigma}$ assigns to $\ulcorner\exists x(x = c)\urcorner$, nothing

[19] Linnebo also develops the objection as it pertains to quantification: "This prompts the question of how many [objects in the range of L's variables] there are. Since there are dense linear orderings without endpoints of any infinite cardinality, there is no reason why the domain should have one cardinality rather than another! The cardinality of the domain over which we quantify would be another brute and inexplicable fact." (p. 93)

further is required to determine who c's referent is. For c's referent is not selected from a bucket of alternatives: it is just whichever aspect of a way for the world to be is rendered salient by c when a network of connections is built on the basis of $[\![\ldots]\!]^{\Sigma}$.[20]

So far we have been considering the question of what c refers to from the perspective of someone whose language is an extension of L^{Σ} and is therefore in a position to assert ⌜"c" refers to c⌝. How should the question be addressed from the perspective of someone whose language does not extend L^{Σ}? On the Network Conception, one should be reluctant to speak of reference when it comes to languages other than one's own. For if a term refers, it must refer to *something* and the conceptualization afforded by one's own language may not deliver a domain that includes a suitable something. The best one can do from an external perspective is to attempt a *translation* of the target language into one's own. In this case, there are multiple such translations. If one's external language includes real analysis, one might use quantifiers ranging over the real numbers as a translation of L^{Σ}'s quantifiers and "$\sqrt{2}$" as a translation of c; or one might use quantifiers ranging over the rational numbers as a translation of L^{Σ}'s quantifiers and "1/3" as a translation of c. But a friend of the Network Conception would take the availability of multiple translations to be harmless. It is simply a reflection of the fact that there are many different ways of conceptualizing $\top$.

15 Concluding Remarks

I hope to have shown that there is a coherent conception of objecthood that can be used to motivate the Ultra-Thin Conception of reference and to answer Linnebo's concerns.

[20] I don't mean to suggest that the Network Conception precludes interesting metasemantic questions. The point is, rather, that such questions will always involve sentences rather than subsentential expressions. There is certainly a non-trivial story to be told about why "Mt. Everest" refers to Mt. Everest rather than Mt. Kilimanjaro. But on the Network Conception the story consists of explaining why a sentence like "Mt. Everest is tall" came to be associated with the (coarse-grained) proposition $\{w : \text{at } w, \text{Everest is tall}\}$ rather than $\{w : \text{at } w, \text{Kilimanjaro is tall}\}$. Once the interpretations of such sentences are fixed, nothing further is required to settle the question of whether "Mt. Everest" refers to Mt. Everest. Mt. Everest is whichever aspect of a way for the world to be is rendered salient by "Mt. Everest" when a network of connections is built on the basis of our assignment of coarse-grained propositions to sentences.

I have not cast doubt on Linnebo's Thin Conception of reference. But my discussion does suggest a challenge. A defense of a thin (or ultra thin) conception of reference, must ultimately rely on a conception of objecthood that steers clear of the Bucket View. And, as we saw in §4, Frege's dictum—to be an object is to be the referent of a possible singular term—is not an especially articulate way of describing such a conception of objecthood.

My best effort to characterize a suitable conception of objecthood is the Network Conception. But on the Network Conception, the Ultra-Thin Conception's sufficient condition for reference is adequate: there is no reason for the additional requirements that the Thin Conception brings in. So if Linnebo wants to insist on these additional requirements, it would be desirable for him to go beyond Frege's dictum and give a detailed characterization of a conception of objecthood that motivates his additional requirements while steering clear of the Bucket View. The resulting view would deepen our understanding of the proposal in his book, and it would put us in a position to choose between thin and ultra-thin conceptions of reference by engaging with the conceptions of objecthood they are underwritten by.

At the end of the day, proponents of the Thin and Ultra-Thin Conceptions are kindred spirits. As far as I'm concerned, what really matters is that we develop a viable alternative to the Bucket View. Whether or not the resulting conception of objecthood yields a thin or ultra-thin conception of reference is a matter of detail. And, as Linnebo's book makes clear, the Thin Conception can be used as the foundation for a magnificent philosophical edifice.[21]

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