The new collapse argument against quantifier variance*

Theodore Sider

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The collapse argument against quantifier variance is usually presented as follows. According to quantifier variance, quantifiers can change their meanings in a way that affects truth value, despite retaining their usual logical behavior. For instance, the existential quantifier could obey the usual inference rules in each of a pair of languages, but vary in meaning so that some sentence $\exists x F x$ is true in one language and false in the other (without the predicate F varying in meaning). But suppose we introduce a single language containing a symbol $\exists_1$ that means what $\exists$ means in the first language, and a second symbol $\exists_2$ that means what $\exists$ means in the second language (and in which F's meaning is unchanged). Then $\exists_1 x F x$ should be true and $\exists_2 x F x$ false in the combined language. Moreover, $\exists_1$ and $\exists_2$ should each obey the usual rules of inference in the combined language. But this cannot be, for that language would then contain a logically correct derivation of the false $\exists_2 x F x$ from the true $\exists_1 x F x$:[1]

$\exists_1 x F x$	(assume)
$F a$	(existential elimination for $\exists_1$)
$\exists_2 x F x$	(existential introduction for $\exists_2$)

We can also argue, in parallel fashion, from $\exists_2 x F x$ to $\exists_1 x F x$. The allegedly inequivalent quantifiers collapse.

As Cian Dorr shows in his remarkable paper, "Quantifier Variance and the Collapse Theorems", this argument is a hot mess. When one bears down on the details, many subtle obstacles arise.[2] Nevertheless, Dorr argues, there is a successor argument that fares better. Although it is not decisive, he says, it carries some weight.

My aim is to show that quantifier variantists can respond to Dorr's successor argument.[3] Further, our discussion will lead to an important distinction between varieties of quantifier variance.

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[1] See Belnap (1962); Harris (1982) for related arguments in another context.

[2] See also Warren (2015).

[3] Dorr considers possible replies, but his discussion is very abstract. I want a reply that you can really wrap your molars around, as my college roommate used to say. See also Warren (2022).

1. Quantifier variance

Quantifier variance (of one variety) is the metaphysical core of Eli Hirsch's ontological deflationism, which is a reaction to debates like this one:[4]

> *Universalist*: Tables and chairs exist! So do "scattered" objects, such as the sum of my nose and the Eiffel tower. *Any* collection of entities has a mereological sum.

> *Organicist*: No, tables and chairs do *not* exist! (Let alone scattered objects.) But people, animals, trees, and other living things do exist. In fact, living things are the only material objects that exist (other than partless "simples").

According to Hirsch, this debate (as well as certain others, such as whether there exist temporal parts) rests on false presuppositions. (Hirsch puts it more colorfully.) The participants assume an inflationary conception of ontology: that ontological questions are substantive and worldly, that they are to be settled by "theoretical means", and that they perhaps have revisionary answers. But in fact, according to Hirsch, these ontological questions are nonsubstantive and should be answered by conceptual analysis; revisionary answers are therefore nonstarters. For quantifier variance is true: quantifiers have multiple possible meanings. We could choose to speak a language, call it "Universalese", in which quantifiers have a meaning that renders sentences like 'there are chairs' and 'any collection has a mereological sum' true. We could instead speak a language, "Organicese", in which 'tables do not exist' and 'everything is either simple or alive' are true. Or we could choose to speak in accordance with any of the other "positions" in this pseudo-debate. All of these languages are, moreover, "on a par", in ways we will need to discuss further, in section 7. (For instance, we should not view "smaller" quantifier meanings as being mere restrictions of a distinguished "largest" quantifier meaning.) Thus, according to Hirsch, the only sensible question to ask is the conceptual one of which language is *our* language. (And the answer to that, he says, is obviously *not* either Organicese or Universalese.)

[4]Lewis (1986, 211–13) and van Cleve (1986) defend universalism; van Inwagen (1990) defends organicism. Hirsch's writings on quantifier variance are collected in Hirsch (2011). Quantifier variance is akin to the views of Putnam (1987*b*) and, to a lesser extent, Goodman (1978), and even Carnap (1950), minus the verificationism (although see Thomasson (2015, section 1.5)).

2. Dorr's collapse argument

In Dorr's successor collapse argument, rather than considering a language that combines quantifiers from different languages, we instead discuss the *meanings* of those quantifiers from the perspective of our own language.

Our language must therefore allow quantification (whether first- or higher-order) over meanings of various sorts. The meanings of predicates are *concepts*; the meanings of sentences are *propositions*; and the meanings of quantifiers are *functions from concepts to propositions*. For instance, the function denoted in English by 'something' maps the concept of being a chair to the proposition that something is a chair.

Another crucial notion is *entailment*, which applies to both concepts and propositions. The proposition that snow is white entails the proposition that either snow is white or grass is blue; the concept of being a chair entails the concept of being either a chair or a donkey.

The argument also employs an operation of "expansion", which maps propositions to concepts. The expansion $\mathrm{Exp}(p)$ of a proposition p is the concept of being such that p is true. Thus the expansion of the proposition that snow is white is the concept of being such that snow is white.

We'll also need the following pair of definitions, where Q is any function from concepts to propositions:[5]

Q obeys ∃-intro $=_{\mathrm{df}}$ c entails $\mathrm{Exp}\big(Q(c)\big)$, for any concept c

Q obeys ∃-elim $=_{\mathrm{df}}$ if c entails $\mathrm{Exp}(p)$ then $Q(c)$ entails p, for any concept c and proposition p

These correspond to the usual quantifier introduction and elimination rules in proof systems with sequents that may contain formulas with free variables.[6] To illustrate, let E be the meaning of 'something' in our language, and c be the meaning of 'is a chair'. Thus c is the concept of being a chair, E is the function that maps each concept to the proposition that something has that concept, $E(c)$ is the proposition that something is a chair, and $\mathrm{Exp}(E(c))$ is the concept of being such that something is a chair. So if E obeys ∃-intro, then c

[5] These are Dorr's *global, open* versions of ∃-intro and ∃-elim (2014, p. 547).

[6] These systems may not be familiar. Introductory logic textbooks usually handle reasoning with assumptions (in conditional proof or reductio, for instance) "graphically", in that whether a line in a proof holds absolutely, or only given an assumption, is marked by some graphical means. Here is an example of a proof in a typical system:

1.	$\exists x C x$	
2.	$C x$	2, $\exists$E
3.	$C x \vee U x$	2, $\vee$I
4.	$\exists x(C x \vee U x)$	3, $\exists$I
5.	$\exists x C x \rightarrow \exists x(C x \vee U x)$	1–4, $\rightarrow$I

Line 1 is an assumption, which is marked by a horizontal line; and the vertical line indicates that lines 2–4 (and 1 itself) hold only given that assumption, and can't be referenced "outside" the sub-proof 1–4.

An alternate approach uses "sequents". A sequent $\Gamma \vdash \phi$ consists of a list Γ of formulas (the "assumptions") and another formula, ϕ (the "consequent", which is said to follow from the assumptions), separated by the symbol '$\vdash$'. (In the most theoretically interesting systems, the notion of sequent is generalized to allow multiple consequents.) In a proof system based on sequents, each line is a sequent, so that dependence on assumptions is explicitly indicated in each line: the sequent's consequent is represented as depending on its assumptions. Sequent rules of inference specify how to move from some sequents to a further sequent. Thus whereas more familiar rules say "if this then that", sequent rules say "if these imply that, then these others imply that other". In a somewhat abbreviated presentation (to avoid irrelevant complexity), here is how the example above works in a proof system based on sequents (in a "sequent natural deduction" system, in the terminology of Pelletier and Hazen (2021); that article contains useful background on all of the issues in this note):

1.	$C x \vdash C x \vee U x$	$\vee$ I
2.	$C x \vee U x \vdash \exists x(C x \vee U x)$	$\exists$ I
3.	$C x \vdash \exists x(C x \vee U x)$	1, 2, cut
4.	$\exists x C x \vdash \exists x(C x \vee U x)$	3, $\exists$E
5.	$\vdash \exists x C x \rightarrow \exists x(C x \vee U x)$	4, $\rightarrow$I

(The "cut" rule at line 3 is a sort of transitivity of implication. And note how the discharging of an assumption by the rule of $\rightarrow$I works: $\exists x C x$, which was on the left of '$\vdash$' in step 4, moved to the right of '$\vdash$' in step 5, as the antecedent of a conditional.) The correctness of an application of a sequent rule depends only on the sequents involved, and not on any further graphical marking, since any dependence on assumptions is already incorporated into the sequents. (Thus each line in a sequent proof is a logically correct sequent—compare axiomatic, "Hilbert-style" proofs.) A sequent "says" that its assumptions logically imply its consequent. Thus line 4 says that $\exists x C x$ implies $\exists x(C x \vee U x)$; and the sequent in line 5, which has no assumptions, says that $\exists x C x \rightarrow \exists x(C x \vee U x)$ is logically implied by the empty set of assumptions (and thus is a logical truth). The rule of existential introduction (or anyway, the simplified version of it used in line 2) allows us to infer (without needing any "input" sequent at all) any sequent of the form $\phi(\alpha) \vdash \exists v \phi(v)$. If we think of formulas with free variables as standing for concepts, line 2 can be thought of as saying that the concept of being either C or U implies the concept of being such that something is either C or U. The rule of existential elimination (used in the move from 3 to 4) lets us move from a sequent of the form $\phi(\alpha) \vdash \psi$ to the sequent $\exists v \phi(v) \vdash \psi$ (provided α does not occur in ψ except perhaps as a bound variable). Continuing to think of

must entail $\mathrm{Exp}(E(c))$—the concept of being a chair must entail the concept of being such that something is a chair. Similarly, the concept of being a chair or a unicorn must entail the concept of being such that there is something that is either a chair or a unicorn. And if E obeys $\exists$-elim, then if the concept of being a chair entails the concept of being such that there is something that is either a chair or a unicorn, then the proposition that something is a chair must entail the proposition that there is something that is either a chair or a unicorn.

The simple glosses of meanings given in the previous paragraph depended on the fact that those meanings were signified by expressions in our language. We can call $E(c)$, for instance, "the proposition that something is a chair" only because E is what our word 'something' means. Where E' is some other function from concepts to propositions (perhaps the meaning of 'something' in some other ontological language), there is no guarantee that the proposition $E'(c)$ can be glossed in that way; indeed, our language might not contain any simple gloss at all. But even when we cannot gloss meanings, we can still name and quantify over them. We can ask whether E' obeys $\exists$-intro—whether every concept c entails $\mathrm{Exp}\big(E'(c)\big)$—without being able to gloss either E' or all of the concepts c quantified over in the definition of 'obeys $\exists$-intro'.

We can now state the collapse argument. Its main premise is that the meanings of existential quantifiers in alternate ontological languages obey both $\exists$-intro and $\exists$-elim. (This meant to be the articulation, in the present setting, of the idea that those quantifiers "retain their usual logical behavior".) Consider, for example, the meanings O and U of 'something' in Organicese and Universalese, respectively. Where c is any concept, we can argue:

c entails $\mathrm{Exp}\big(O(c)\big)$ (since O obeys $\exists$-intro)

So, $U(c)$ entails $O(c)$ (since U obeys $\exists$-elim)

A parallel argument (using first the fact that U obeys $\exists$-intro and then the fact that O obeys $\exists$-elim) shows that $O(c)$ also entails $U(c)$. Conclusion: for any concept, the propositions generated by applying U and O to that concept are mutually entailing. The argument can be repeated for any pair of quantifier meanings that obey $\exists$-intro and $\exists$-elim.

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formulas with free variables as denoting concepts, the move from 3 to 4 can be thought of thus: if the concept of being C entails the concept of being such that something is either C or U (line 3), then the proposition that something is C entails the proposition that something is either C or U (line 4).

Now, in addition to its main premise, this argument also implicitly assumes that $O(c)$ and $U(c)$ are well-defined. More generally, it assumes that there is a common stock of concepts, such that quantifier-meanings from alternate languages are well-defined on all of them.

I used to think that this assumption (or rather, one like it) should be rejected by quantifier variantists (Sider 2007, section 2.7; 2011, section 9.6.1). My picture was that a concept—a possible predicate-meaning—is just a way of making a cut in a domain, of distinguishing some things from others, and so is tied to a particular conception of "thinghood". Thus the entire domain of concepts covaries with the meanings of quantifiers. Each ontological language has its own proprietary stock of concepts, and indeed, its own meaning of 'concept'.

One implication of this picture is that no predicate in one ontological language means the same thing as any predicate in any other ontological language. Here is an argument that this is indeed correct. Suppose I speak a "smaller" language, and that one of my predicates shares a meaning, c, with some predicate in a "larger" language. Then c must be the kind of entity that does something more than merely the following: distinguishing between things that are a certain way and things that aren't. (I am speaking my own language, using my own meaning for the quantifier 'things'.) For c is capable of attaching to the meanings of names of the richer language and yielding a truth value; and those meanings aren't entities (again, I'm employing my own meaning of 'entities').[7] But (I used to think), none of *my* predicates has such a rich meaning; all that my (extensional) predicate-meanings know how to do is operate on objects to yield truth-values.

But Dorr (2014, pp. 530–1) has convinced me that my earlier reaction was a little narrow-minded.[8] A "transcendent" conception of concepts, on which

[7] Possible objection (inspired by Montague): in richer languages—and perhaps in all of the languages—concepts don't operate on name-meanings; rather, name-meanings operate on concepts.

[8] Partly I just wasn't thinking of how the higher-order viewpoint might bear on the question. Perhaps I was also overly guided by the realism about metaphysically best descriptions defended in Sider (2011). If predicate meanings have a metaphysically best description; and if that description would need to be stated using quantifiers, as I suppose it must if we neglect the higher-order viewpoint (I was opposed in Sider (2011) to reference to abstract entities in metaphysically fundamental contexts); and if each language shares predicate meanings; then the quantifiers in the description of those shared predicate meanings would seem to be metaphysically privileged. However, realism about metaphysically best descriptions is itself arguably in tension with quantifier variance independently (Sider, 2011, section 9.6.2).

the quantifier meanings from different languages operate on a common stock of concepts, now strikes me as being compatible with the spirit of quantifier variance. (Or rather, with the spirit of one variety of quantifier variance. See section 8.) For the time being, at least for the sake of argument anyway, let's assume that conception.

3. Transcendent vs immanent entailment

There is a question of whether entailment should also be conceived as transcendent, or instead as being "immanent" in that 'entails' means different things in different ontological languages.

Immanence of entailment (of a certain sort, anyway) would undermine the collapse argument (Dorr, 2014, p. 537). Suppose that each language defined concept-entailment as follows:

> Quantificational Entailment: concept d entails concept $d' =_{\text{df}}$ necessarily, for all x, if x is d then x is d'

Since the quantifier 'for all x' occurring in the definition varies in meaning across the languages, 'entails' would also vary in meaning. 'Obeys ∃-intro' and 'obeys ∃-elim' would therefore vary as well. So even if in each language the meaning of 'something' has the properties expressed *in that language* by 'obeys ∃-intro' and 'obeys ∃-elim', it might lack the properties expressed by those phrases in *other* languages, and in particular, in the language used to state the collapse argument.

Let's look at this more closely.

Quantifier variantists' motive for saying that quantifiers "obey the usual rules" in alternate ontological languages is to avoid trivializing their position. Since everyone agrees that meaning is conventional (in some sense), everyone agrees that the bare symbol or sound 'something' could have been used to mean different things. To go beyond this truism, quantifier variantists insist that it could mean different things while retaining enough similarity to its actual meaning to still count as "being a quantifier" in some sense—as still expressing "a notion of the existence of something" (Hirsch, 2002, p. 53). And a big part of this similarity is retaining the same inferential role.

That is their *motive*; here is their picture of how this happens. Different ontological languages result from adjusting "material" dispositions of speakers to accept sentences, while leaving "logical" dispositions intact. Actual English

speakers are disposed to accept 'There is a chair in this room' in certain circumstances, but they could begin instead to refrain from accepting that sentence in those circumstances and even to accept its negation. Moreover, they might do so while continuing to maintain the dispositions that determine what 'chair' means. They might continue to accept sentences like 'a chair is an artifact used for sitting'; they would simply need to refrain from accepting 'there is an artifact for sitting' in the circumstances in question. Moreover—and this is the important point—they might do all this without altering their dispositions to *reason* using 'something' and other quantifiers. It is adjustments like these that are meant to transform a community of English speakers into a community of speakers of Organicese, in which quantifiers differ materially but not logically.

Now, I will argue in a moment that these logical dispositions call only for "intra-language", and not "inter-language", obedience of ∃-intro and ∃-elim, given Quantificational Entailment. (That is, the meaning of the existential quantifier in a language L must have the properties expressed by 'obeys ∃-intro' and 'obeys ∃-elim' in L, but perhaps not the properties expressed by those phrases in a distinct language L'.) But there is a wrinkle. There is a disconnect between the relevant sort of logical dispositions, on one hand, and ∃-intro and ∃-elim, on the other. For the dispositions concern entire sentences: we infer sentences from sentences, for instance, not predicates from predicates. And although it is clear how such dispositions bear on *propositional* entailment, it is initially unclear how they bear on entailment between *concepts*, and thus initially unclear how they bear on whether the meaning of 'something' obeys ∃-intro and ∃-elim.

This disconnect will be important in section 5 below, but here it can be bridged. Given Quantificational Entailment, obedience of ∃-intro and ∃-elim amount to the following:[9]

Q obeys ∃-intro $=_{\text{df}}$ For any concept, c, necessarily, for all x, if x is c then x is $\text{Exp}\big(Q(c)\big)$

Q obeys ∃-elim $=_{\text{df}}$ For any concept c and proposition p, *if* necessarily, for all x, if x is c then x is $\text{Exp}(p)$, *then* necessarily, if $Q(c)$ then p

And it is clear what sorts of logical dispositions are relevant to whether the meaning, Q, of 'something' obeys these constraints: they will be dispositions to

[9]Understanding propositional entailment as necessitation, in accord with the current modal-quantificational understanding of entailment between concepts.

accept sentences like (1) in the case of ∃-intro, and (2) in the case of ∃-elim:[10]

(1) necessarily, for all x, if x is a chair then x is such that something is a chair

(2) *If* necessarily, for all x, if x is a chair then x is such that something is either a chair or a unicorn, *then* necessarily, if something is a chair then something is either a chair or a unicorn

For if 'something' means Q, (1) and (2) are instances of 'obeys ∃-intro' and 'obeys ∃-elim', respectively.

Or rather, they are instances if 'for all x' has the same meaning throughout—if, that is, 'for all x' has the same meaning in (1) and (2) as it has in the definitions of 'obeys ∃-intro' and 'obeys ∃-elim'. But if 'for all x' means something different, then speakers' dispositions regarding (1) and (2) will be simply irrelevant to whether the meaning of their word 'something' has the property expressed by 'obeys ∃-intro' and 'obeys ∃-elim', just as our dispositions to accept 'all bachelors are unmarried' are irrelevant to the question of how our meaning for 'bachelor' relates to the meaning of 'unmarried' in a language in which the latter word refers to fish.

Exactly how does this undermine the collapse argument:

c entails $\mathrm{Exp}\big(O(c)\big)$ (since O obeys ∃-intro)

So, $U(c)$ entails $O(c)$ (since U obeys ∃-elim)

(where O is the meaning of something' in Organicese and U is the meaning of 'something' in Universalese)? The answer depends on which language we are speaking when we give the argument (since 'obeys ∃-intro' and 'obeys ∃-elim' are tied to our meanings of the quantifiers). Suppose, for instance, we are speaking Organicese. We should then reject the assumption that U obeys ∃-elim, and thus reject the move from the premise to the conclusion. For as we saw above, the dispositions of Universalese speakers to accept *Universalese* sentences like (2) do not favor an attachment of their word 'something' to a meaning that satisfies what *we* call "obeying ∃-elim". And in fact, their dispositions *dis*favor such an attachment. Letting 'is organic' abbreviate 'is either a living organism or is mereologically simple', speakers of Universalese accept 'Necessarily, every organic-and-nonorganic chair is such that $2+2=5$' (since the antecedent is necessarily false) and deny 'Necessarily, if something is a non-organic chair then $2+2=5$'; thus they would reject:

[10] And also dispositions to infer the consequent of (2) from its antecedent, though if the speakers use conditionals as we do this yields nothing new.

(3) *If* necessarily, for all x, if x is organic and x is a non-organic chair then x is such that $2+2=5$, *then* necessarily, if U(non-organic chair) then $2+2=5$

But (3) is necessarily equivalent to what we speakers of Organicese would express thus:

(4) *If* necessarily, for all x, if x is a non-organic chair then x is such that $2+2=5$, *then* necessarily, if U(non-organic chair) then $2+2=5$

For propositions we express with our unrestricted quantifier "For all x, ϕ" are necessarily equivalent to propositions that Universalese speakers express with their restricted quantifier "For all x, if x is organic then ϕ". But (4) is an instance of U obeying [what we call] $\exists$-elim. Thus their disposition to reject (3)—and a host of other such dispositions—disfavors the attachment of their word 'something' to a meaning U that satisfies [what we call] $\exists$-elim. (To be sure, their dispositions favor an attachment to a meaning that satisfies what *they* call '$\exists$-elim'.)

Intuitively: the failure of Universalese dispositions to favor U obeying $\exists$-elim is due to the fact that from the point of view of speakers of Universalese, our Organicese notion of entailment over concepts is too weak (since it is defined using our narrower quantifier). This relative weakness in our notion of entailment results in corresponding relative weakness in the premise of $\exists$-Elim, namely "c entails Exp(p)", but not in any corresponding relative weakness in its conclusion "$U(c)$ entails p", since that involves propositional entailment, which isn't defined in terms of quantification (over individuals).

The collapse argument, then, fails if 'entails' is defined in terms of quantification, as in Quantificational Entailment. It's natural to conclude that *no* immanent notion of entailment will do, and that the argument must therefore employ a transcendent notion of entailment—that is, a conception of entailment under which 'entails' means the same thing in each language.

Dorr considers several non-quantificational definitions of entailment, the simplest of which is this: for concept d to entail concept d' is for d to be identical to its conjunction with d': $d = d \wedge d'$. This employs an operation of conjunction on concepts and presupposes a non-structured conception of concepts, of a sort that is now familiar in the literature on higher-order metaphysics.[11] An alternate approach would be to take entailment as an undefined notion, posited to be

[11] See Dorr (2016).

transcendent. Either way, let's assume for now that entailment—and hence the notions of ∃-intro and ∃-elim obedience—are transcendent. This assumption is, I think, natural to pair with the transcendent conception of concepts. Since the stock of transcendent concepts is common amongst the languages, it constitutes an objective backbone for describing the world. But it's natural to think of entailment, in either of the senses now being entertained, as being tied up with the very nature of concepts, and thus natural to expect entailment itself to be part of the objective backbone. (Conversely, if, as discussed in the previous section, one thinks that concepts are too tied to quantification to be understood transcendently, one will likely think the same about notions like entailment or conjunction over concepts.)

4. A preliminary reply to the collapse argument

The best version of the collapse argument, then, employs a transcendent notion of entailment. In reply to this argument, I say, a quantifier variantist like Hirsch should deny that the meaning of the existential quantifier in Organicese obeys ∃-intro. The reason is that transcendent entailment is sensitive to "trans-ontic structure".

Suppose we are speaking Organicese. Then, we will say, since it's necessary that everything is organic (where 'organic' again abbreviates 'is either a living organism or is mereologically simple'), each of the following three concepts is necessarily uninstantiated:

being a non-organic chair

being a non-organic table

being either a non-organic chair or a non-organic table

Thus these three concepts are necessarily coextensive. But, whereas the first entails the third, if entailment is transcendent then the first does not entail the second. This can be seen as follows. (a) 'Not every non-organic chair is a non-organic table' is true in Universalese. So (b): this sentence is true in Universalese:

(+) The concept being a non-organic chair does not entail the concept being a non-organic table.

But (c): given transcendent entailment, 'entails' in Universalese means what *we* mean by 'entails'; and everything else in (+) means the same in Universalese as in our language; and so (+) is true in our language as well. So, (d): being a non-organic chair does not entail being a non-organic table.

Thus we can say (as speakers of Organicese) that entailment is "sensitive to trans-ontic structure". The three concepts are ontically equivalent (necessarily coextensive) but not equivalent when it comes to entailment. (Speakers of Universalese would not call the relevant structure "trans-ontic", since they accept 'some non-organic chairs are not tables'. What 'ontic' means depends on what one's quantifiers mean.)

This sensitivity is unsurprising. As noted in section 2, a transcendent concept is more than just a way of distinguishing things that have it from things that don't—more than just a way of making a cut in a domain of entities. If concepts themselves are sensitive in this way to trans-ontic structure, it's unsurprising that concepts' entailments are sensitive to this structure.

The move in the argument from step (a) to step (b) assumes that:

(E) One concept entails another only if everything satisfying the first satisfies the second

is true in each language. To be sure, we are not defining entailment between concepts in quantificational terms. But any reasonable notion must surely be subject to this quantificational *constraint*. Speakers of any of our ontological languages would regard (E) as a "meaning postulate" on 'entails'. They'd offer up the infamous refrain: "if you deny it, I don't know what you mean by 'entails'".[12]

With all this in mind, here is an argument that the concept, c, of being a chair does not entail $\mathrm{Exp}\big(O(c)\big)$, and hence that O does not obey $\exists$-intro. (I continue to speak Organicese.) (a): 'Not every chair is such that $O(c)$' is true in Universalese (Universalese speakers accept 'The sentence "there are chairs" expresses a false proposition in Organicese'); so, (b): 'c doesn't entail $\mathrm{Exp}\big(O(c)\big)$' is true in Universalese; (c) 'entails' and everything else in the sentence just quoted mean the same things in Universalese as in our language, and so that sentence is true in our language; and so, (d): c doesn't entail $\mathrm{Exp}\big(O(c)\big)$. And so, O does not obey $\exists$-intro.

[12] It's essential to the argument I'm making that there is not a similarly strong case for the converse of (E), or a modalized converse of (E), being true in every language.

5. "The usual logical rules"

Quantifier variantists insist that "quantifiers obey the usual logical rules" in alternate ontological languages. How then can they deny that the meaning of 'something' in Organicese obeys ∃-intro?

Although *O* does not obey ∃-intro, it does obey "ontic ∃-intro" in that, necessarily, for any concept d and entity x, the proposition that x is d entails the proposition that $O(d)$ (I continue to speak Organicese). Ontic ∃-intro is so-named because it is defined in terms of quantification over individuals. ('Ontic ∃-intro' therefore varies in meaning from language to language.) It is sensitive merely to ontic structure, whereas (full) ∃-intro obedience additionally makes demands on trans-ontic structure. Some concepts with no instances, such as the concept of being a chair, must be mapped to true propositions by any (full) ∃-intro-obeying function, whereas other empty concepts, such as the concept of being a round square, need not be mapped to true propositions.

The insistence on the usual logical rules is to avoid trivialization (section 3). But the quantifier variantist can claim to avoid trivialization by saying that in each ontological language, 'something' denotes a function that satisfies the meaning of 'obeys ontic ∃-intro' in that language.

Moreover, obedience of ontic ∃-intro is all that the logical dispositions of speakers of Organicese (and other ontological languages) metasemantically demand. According to quantifier variance, quantifier meanings vary across ontological languages because material dispositions vary while logical dispositions remain constant. But these logical dispositions involve reasoning with sentences, not predicates (recall the disconnect mentioned in section 3). Roughly speaking, the dispositions are to infer 'something is ϕ' from any true sentence of the form 'a is ϕ', where a is a name, demonstrative, or indexical. Perhaps such dispositions demand that 'something' has a meaning under which these inferences come out truth-preserving (given some appropriate charity-based metasemantics). But this demand only requires satisfaction of ontic-∃-intro. For satisfaction of full ∃-intro requires the truth of 'something is a chair'; and Organicese speakers don't accept any instances of that sentence.

It might be objected that we have further relevant dispositions, namely dispositions with respect to systems of formal logic in which introduction and elimination rules for quantifiers involve sentences containing free variables.[13] For instance, perhaps we are disposed to apply the term 'valid' to proofs in

[13] See note 6.

these systems. But "theoretical" dispositions like these, which only manifest themselves after significant training in abstract matters, are surely far less metasemantically significant than the more everyday dispositions that constitute the backbone of ordinary usage. Also, if it is metasemantically relevant what ordinary speakers would say and think if "primed" with information about abstract matters of logic, the relevant priming should surely be with *all* of the relevant information, including the argument of the previous section. An Organicese speaker thus primed might reason as follows.

> I see that this formal system has the virtue of providing a proof for each valid argument involving sentences without free variables. But its rule of existential introduction fails to be valid in a certain concept-entailment-theoretic sense: its premise, for instance 'x is a chair' can express a concept (c) that doesn't entail the concept expressed by its conclusion, 'There is a chair' ($\mathrm{Exp}\big(O(c)\big)$). The system elegantly achieves a desired end by shady means, like axiomatic systems of modal logic which use the non-truth-preserving rule of necessitation.

6. The reply restated, and a quantifier variantist-friendly conception of entailment

So: it can be argued that quantifier meanings needn't obey ∃-intro (section 4), and that this doesn't clash with quantifier variantists' commitments (section 5). To be sure, the argument presupposed quantifier variance—it simply assumed that 'There are chairs' is true in Universalese but not in Organicese. This isn't on its own inappropriate: one can rebut an objection by showing that the falsity of its premises is only to be expected given one's position. But a fuller—and, moreover, less language-relative—picture of what is going on would be more satisfying. Instead of relying solely on assumptions about what sentences are true in the different languages, it would be nice to have a language-independent conception of concepts and entailment that would explain the failure of ∃-intro.

We have refrained from defining entailment in quantificational terms, in order to give the collapse argument its best chance of success. (We must similarly refrain from defining concept-conjunction in terms of quantification, if entailment is defined in terms of that operation.) This is fine, but there is a danger of over-abstraction. Concepts and entailment (and conjunction) are

normally introduced in terms of entities and quantification: a concept is a way for a thing to be, and one concept entails another iff anything with the first must have the second (and one concept is the conjunction of two others iff what it is for something to have the first is for it to have the second and third). Once quantifier variance is on the table, it is indeed attractive to broaden our outlook and not take these glosses in any particular language as definitive. But concepts and entailments (and conjunction) had better remain "world-facing" at their core, however formally elegant a purely algebraic treatment might be, if we are to maintain contact with our subject matter.

Thus, I would argue, the language-independent conception of concepts and entailment that we seek must include a language-independent conception of worldly constraints on entailment. The language-relative constraint (E) was considered in section 4; now we seek a language-independent one.

According to the variety of quantifier variance we have been discussing, reality has a structure that makes it representable in any of a certain range of ontological languages. (Other varieties will be discussed below.) When "larger" languages (like Universalese) are adopted, the quantifiers are sensitive to more of that structure, and when "smaller" languages (like Organicese) are adopted, the quantifiers are sensitive to less. But (transcendent) entailment, I say (on behalf of the quantifier variantist), is sensitive to *all* of the relevant structure. And from the point of view of a smaller language, some of this structure is trans-ontic.

How should we think about this trans-ontic structure, in virtue of which, for instance, the concept being a chair does not entail the concept of being a table? One *wants* to say that this entailment fails because "some portions of reality are chair-ish but not table-ish". Similarly, c, the concept of being a chair, doesn't entail $\mathrm{Exp}\big(O(c)\big)$ because some c-ish portions of reality are not such that $O(c)$—some chair-ish portions of reality are not such that there-are-in-the-Organicese-sense-chairs). In general, entailment is subject to this constraint:

(P) Concept d entails concept d' only if every d-ish portion of reality is d'-ish

(a constraint that is strictly stronger—if we're not speaking the "largest" language—than (E), which lays down the merely ontic constraint that every d must be d').

Now, one of the first things you're taught, when learning about the issue of quantifier variance, is *not* to say such things. For this talk of "portions of

reality" appears to involve quantification over individuals. A sentence like 'Some portion of reality is chair-ish' seems to have the logical form:

There is some x such that i) x is a portion of reality, and ii) x is chair-ish

Thus if one is speaking a "small" language like Organicese, the displayed sentence would be false, since on any reasonable construal of 'is chair-ish', a speaker of Organicese will say that nothing satisfies it. One might respond that trans-ontic structure can be fully described only in the "largest language", in which, so to speak, every portion of reality counts as an object. (Even Universalese isn't large enough if it merely allows unrestricted composition without recognizing temporal parts.) But the idea was to describe trans-ontic structure in a non-language-relative way.

Thus dodgy apparent quantification over "portions" of reality can't be used in a load-bearing description of trans-ontic structure (though I do think it's useful for picture-thinking). But there are other options. For instance, instead of saying "some portions of reality are chair-ish", a small language might contain the resources to say one of the following things:[14]

(i) There are some simples arranged chair-wise

(ii) If composition had been unrestricted, there would have been a chair

(iii) There exist $x_1, \ldots, x_n$ such that $\phi(x_1, \ldots, x_n)$ [see below]

(iv) There is a certain function from times to sets of ultimate entities that is chair-like

(i) relies on the presence of plural quantifiers, and a certain locution "arranged ___-wise", which converts a predicate of single entities to a corresponding plural predicate. (ii) relies on counterpossible conditionals (following Dorr (2005)). (iii) relies on the idea that some concepts, or at least certain "cases" of some concepts, are finitely definable. ϕ is to be a predicate that, intuitively, describes one particular way in which finitely many simples could be arranged

[14]Methods (i)–(iii) are directed at the compositional dimension of variation amongst ontological languages; new or modified methods will be needed to accommodate the temporal dimension. For instance, define a slugamoon as the fusion of a temporal part of a slug with a later temporal part of a moon; the upshot of "there is a slugamoon-ish portion of reality" can be stated in (Endurantist) Organicese using this variant of (i): "There is a pair of times such that, at the former there exists a slug, and at the later there exist some simples arranged moonwise".

chairwise. (iv) relies on the existence of functions, on the locution "___-like", which converts a predicate of concrete entities to a corresponding predicate of functions, and on an ontology of "ultimate entities", by which I have in mind the most physically fundamental constituents of the world—enduring subatomic particles, perhaps.

Given these locutions, we can state trans-ontic constraints on entailment, which are inspired by the dodgy thought (P) that d entails d' only if "every d-ish portion of reality is d'-ish":

> Concept d entails concept d' only if…
>
> (P-i) …any things that are arranged d-wise are arranged d'-wise
>
> (P-ii) …if composition had been unrestricted, it would have been the case that every d is d'
>
> (P-iii) …for all $x_1,\ldots,x_n$, if $\phi_d(x_1,\ldots,x_n)$ then $\phi_{d'}(x_1,\ldots,x_n)$ [see below]
>
> (P-iv) …every function from times to sets of ultimate entities that is d-like is also d'-like

In the case of (P-iii), the overall constraint should be understood as a schema, whose instances result when d and d' are replaced with names of concepts, ϕ_d is replaced with a predicate such that any things satisfying it would be arranged d-wise, and $\phi_{d'}$ is a predicate such that any n things arranged d-wise would satisfy it.[15]

[15] (P-i) requires a general locution 'arranged ___-wise' (applicable to variables), whereas examples like (i) require only one-off instances. Similarly for '___-like' in (P-iv) and (iv). (P-iii) won't have any instances if d has no finitely stateable sufficient condition or d' has no finitely stateable necessary condition. To characterize (P-iii)'s instances I applied 'arranged ___-wise' to variables, though one needn't place great weight on the schema itself; it is particular instances that seem most compelling. For instance (and with apologies for the toy physics):

> *being a hydrogen nucleus* entails *being a deuterium nucleus* only if: for every x and y, *if:* x is a proton, and either $y = x$, or y is a neutron that is bonded to x, and neither x nor y is bonded to anything other than x or y, *then:* x is a proton, and y is a neutron that is bonded to x, and neither x nor y is bonded to anything other than x or y

The intuitive idea is that, pretending that protons, neutrons, and electrons are mereologically simple, a pair of simples count as "arranged-deuterium-nucleus-wise" iff they consist of a proton and a neutron that are bonded to each other but not to anything else; and similarly for "arranged-hydrogen-nucleus-wise" except that the presence of the neutron is optional. Since this constraint isn't satisfied, we may conclude that *being a hydrogen nucleus* does not entail *being a deuterium nucleus*.

And we can use strategies (i)–(iv) to recast, in a small language, the dodgy argument that c doesn't entail $\text{Exp}\big(O(c)\big)$ because "some chair-ish portions of reality are not such that there are chairs":

Strategy (i): There are some simples arranged chairwise, but which are not arranged "$O(c)$-wise"—i.e., are not such that $O(c)$ is true; so by constraint (P-i), c does not entail $\text{Exp}\big(O(c)\big)$. Strategy (iv) is similar.

Strategy (iii): Let $\phi(x_1,\ldots,x_n)$ be some formula, with variables $x_1,\ldots,x_n$ free, which is in fact true of some simples $s_1,\ldots,s_n$, and which describes some particular arrangement that counts as being "arranged chairwise". Then by a constraint of the form (P-iii), c entails $\text{Exp}\big(O(c)\big)$ only if for any $x_1,\ldots,x_n$, if $\phi(x_1,\ldots,x_n)$ then $O(c)$. But $O(c)$ is false, and we stipulated that $\phi(s_1,\ldots,s_n)$. Thus c doesn't entail $\text{Exp}\big(O(c)\big)$.

Applying the counterpossibles strategy (ii) is delicate. The straightforward application of the strategy would be to employ this constraint on entailment: "c entails $\text{Exp}\big(O(c)\big)$ only if: if composition had been unrestricted, everything that had c would have had $\text{Exp}\big(O(c)\big)$". But the consequent here is true, since if composition had been unrestricted, every chair would have been such that there was a chair. What we really want, intuitively, is to pick out chairish portions of reality inside the scope of the counterpossible, as things, x, that are chairs, but then say that any such x must, *outside* of the scope, so to speak, have $\text{Exp}\big(O(c)\big)$. Thus we must employ something like this variant on constraint (P-ii):

> c entails $\text{Exp}\big(O(c)\big)$ only if: if composition had been unrestricted, it would have been the case that for every x, if c applies to x then *actually*: $\text{Exp}\big(O(c)\big)$ applies to x

(The shift to this variant isn't ad-hoc. The point of the counterpossible conditional is to get around the fact that the "portion of reality" x doesn't in fact exist. But we want to evaluate whether this "fictional" portion of reality *really does* satisfy $\text{Exp}\big(O(c)\big)$—the question is whether c entails $\text{Exp}\big(O(c)\big)$ in a strict, nonfictional sense of '$\text{Exp}\big(O(c)\big)$'.) And then we must claim that the consequent of the displayed sentence is false, on the grounds that if composition had been unrestricted, there would have been some chair that actually is not such that there are chairs.

The structure to which concepts and entailment are sensitive, then, can be described even from the point of view of "small" languages, although perhaps not in a fully general way (in the case of strategy (iii)—see note 15), perhaps only if certain locutions are available (plural quantification, '-wise', '-like'), and

perhaps only given some contentious assumptions (strategy (ii)). The objective credentials of the structure are further bolstered by the fact (and I assume that it is a fact) that each language contains vocabulary for describing facts about the ultimate entities mentioned in connection with strategy (iv). For there would seem to be a sense in which the relevant structure is "nothing over and above" facts about the arrangements over time of these physically ultimate entities; and each ontological language (I assume) is capable of describing these arrangements. (No commitment to any particular way of cashing out "nothing over and above" or "ultimate entity" is required here.) Whether "some portion of reality is chair-ish" is just a matter of the global history of subatomic particles. Indeed, this picture is central to one intuitive route to Hirschian quantifier variance: once the arrangement of physically ultimate particles is fixed, all the facts have been fixed, and there is only the question of how to map quantified language onto these facts.

Now, one might object that there ought to be some *uniquely best way of articulating* the objective structure under discussion, but that recognizing such a best way would contradict quantifier variance. For instance, with a "large" quantifier one can understand 'there is a d-ish portion of reality' as meaning "something is d"; with a "small" but plural quantifier one can understand it as meaning "some entities are arranged d-wise"; and in either case, one might argue, for the description to be uniquely best would require the interpretation of the quantifiers used in the description to be privileged in a way that is incompatible with quantifier variance. I myself think that there is indeed a good objection to quantifier variance in this vicinity (Sider, 2011, section 9.6.2). But the assumption that there must be a uniquely best way to articulate the objective structure is one that quantifier variantists might well reject. They might instead insist that although it is clear that there *is* objective structure that phrases like "portions of reality" gesture toward, and which is ultimately "nothing over and above" facts about ultimate entities, there nevertheless is no uniquely best way of articulating that structure, and there need be no one way of doing so that works in every language.[16]

Thus there is available to the quantifier variantist a conception of reality's objective structure, and a conception of transcendent entailment in terms of that structure, that undermines the collapse argument. This structure can be nonrigorously pictured as consisting of propertied "portions of reality", which quantifier meanings "divide into entities" in different ways. More rigorous

[16]Compare the discussion of "quotienting" in Sider (2020), especially section 5.6.2.

descriptions can be given in various ways; but any demand for a "canonical" or "most fundamental" description must be rejected. The structure is such as to be supported by the configurations of ultimate entities (subatomic particles). It is such as to be fully represented in a maximally large language by statements about entities and the concepts they satisfy. And it is such as to be represented in other languages, to varying degrees of completeness, in part directly, with statements about entities and the concepts they satisfy; and in part indirectly, using strategies (i)–(iv). Entailment is sensitive to this structure. One can think informally of this sensitivity as requiring that "every d-ish portion of reality must be d'-ish" if concept d is to entail concept d'; and since there are indeed chairish portions of reality but none such that $\mathrm{Exp}\big(O(c)\big)$, the Organicese quantifier-meaning O fails to satisfy $\exists$-intro. This picture-thinking needs to be cashed out in precise terms, and there are a number of ways to do so; but as with other statements about the world's objective structure, no single one of them needs to be canonical.

This "conception" of reality's objective structure is in fact a substantive metaphysical assumption. But reliance on substantive assumptions does not compromise the deflationary spirit of quantifier variance. Quantifier variance is deflationary *metaphysics*: it is an answer to certain substantive metaphysical questions that, if true, blocks the existence of certain further substantive metaphysical questions.

7. A distinguished quantifier?

Since Hirsch's quantifier variance is meant to have a deflationary upshot, it must be "egalitarian", in a certain sense. Ontological languages must all be "metaphysically on a par", so that the only sensible question to debate is which language is *ours*—a question of conceptual analysis, not inflationary metaphysics.

But according to the response to the collapse argument that I have recommended to the quantifier variantist, one language would seem to be privileged after all.[17] Under the transcendent notions of concept and entailment I have been assuming, there is a transcendent notion of obeying $\exists$-intro and $\exists$-elim, shared by each language. Given the collapse argument, there can be *at most* one quantifier meaning with this property. Although this leaves open that *none* of the quantifier-meanings have the property, in fact it would seem that,

[17] The general idea behind the concerns I discuss in this section is due to Dorr (see especially his section 6.3), although my presentation departs from his in certain respects.

given my recommended conception of concept-entailment, at least one of them—and thus exactly one of them—*does* have the property: the meaning, L, of the existential quantifier in a "maximally large" language that, to revert to the picture-thinking, counts every portion of reality as an entity.[18]

There is a similar threat to *in*egalitarian forms of quantifier variance, such as that defended by Dorr himself in earlier writings (Dorr, 2005), and later by me (Sider, 2013).[19] According to such views, ontological disputes like that between universalists and organicists are legitimate and substantive, because they concern what exists in a distinguished sense of the existential quantifier—they take place in the language of "Ontologese". Nevertheless, recognizing a distinguished sort of quantification is compatible with recognizing languages in which quantifiers have other meanings. For instance, according to both Dorr (then) and me (now[20]), what exists in the distinguished sense of the quantifiers is radically minimal. Mereological nihilism is true; there are no entities with proper parts. Nevertheless we agree with Hirsch that it would be bad metasemantics to regard ordinary speakers as speaking falsely when they utter sentences like 'there are chairs'; and we conclude that on the correct interpretation of ordinary speakers, their quantifiers have a "larger" meaning, not the distinguished meaning.[21] Ordinary language is not Ontologese. Whereas the threat to Hirsch was that the privilege of the maximal language seems to contradict his claim that all the languages are on a par, the threat to inegalitarian quantifier variance is that the *wrong* language seems to be privileged. For inegalitarians like Dorr and me want to defend minimal ontologies, and thus don't want to identify Ontologese with the maximally large language.

[18]Picture-thinking plausibility argument: (i) L obeys $\exists$-intro: if any possible portion, ρ, of reality is d-ish, then L counts ρ as an object, and so $L(d)$ is true, and so ρ is such that $L(d)$ is true, and so ρ is $\text{Exp}(L(d))$-ish. But (*) d entails d' iff, necessarily, every d-ish portion of reality is d'-ish. So d entails $\text{Exp}(L(d))$. (ii) L obeys $\exists$-elim: let d entail $\text{Exp}(p)$, and suppose that $L(d)$ is true. Then there is some d-ish portion of reality; and since d entails $\text{Exp}(p)$, by (*) that portion of reality is $\text{Exp}(p)$-ish, and so p is true. Thus $L(d)$ entails p.

[19]See also Hirsch and Warren's (2019) contrast between modest and strong quantifier variance.

[20]Actually I am tentative inclined to accept an ontology of sets, and to reduce parthood to set theory. But conditional on the nonexistence of sets, I accept the mereological nihilism discussed in the text. See Sider (2013, section 11).

[21]Inegalitarian quantifier variance is particularly compelling to parents of young children, for whom the ontological extravagance of natural language is vivid. We induct our children into the practice of uninhibited nouning: "Daddy, what is an agreement?"—"An agreement is what you make when you agree with someone."

(This threat must be distinguished from the related but distinct threat that different quantifier meanings are merely the result of imposing different restrictions on a distinguished "largest" quantifier meaning.[22] Any quantifier variantist must answer this formidable challenge, whether by arguing that smaller quantifier-meanings aren't restrictions of larger ones, or by conceding that they are and arguing that this doesn't problematically privilege the largest one.[23] Let's grant for the sake of argument that some such response is successful. The current threat remains, since it doesn't involve the notion of restriction: the largest quantifier meaning appears to be privileged, not by having the others as "restrictions", but rather by being the unique one that satisfies ∃-intro and ∃-elim.)

The response to this threat, from both egalitarian and inegalitarian quantifier variantists, must be that "ontological" privilege, which inegalitarians think is possessed by the Ontologese quantifier meaning and which Hirsch denies is possessed by any quantifier meaning, is distinct from the "logical" privilege of obeying ∃-intro and ∃-elim. The latter privilege amounts to being "maximally sensitive"—sensitive to all relevant aspects of the worldly structure described in section 6. Different quantifier meanings based on that worldly structure differ along two axes: beginning with a certain set of ultimate entities (persisting subatomic particles, I am assuming), how many *decompositions* (into temporal parts) and how many *compositions* (into fusions) are accepted? There is a natural upper limit along these axes, recognizing *unrestricted* decomposition and composition. That is the privilege of maximal sensitivity.

What, then, is ontological privilege? I myself would identify it with *fundamentality* (Sider, 2009, 2011, chapter 9): only the quantifier of Ontologese has a meaning that is perfectly fundamental; only that quantifier carves reality "at its logical joints". From this perspective, Hirsch's opposing view can be described as saying that none of the quantifiers is perfectly fundamental.

But that is just one possible way of thinking about ontological privilege. The core idea of defenders of traditional ontology is, on its face, a simple and natural and theoretically unloaded one: that there is a sensible question of what *really exists*. While my own view is that the best way to stabilize this approach to ontology is to cash out "really existing" using the notion of fundamentality, the core idea isn't tied to that or any other contentious metaphysical vocabulary. Anyone who thinks that there is an open, substantive question of whether

[22] See for instance Button (2013, 18.3); Putnam (1987*a*, p. 33).

[23] Sider (2011, section 9.5) discusses each strategy.

nothing exists other than subatomic particles can regard the quantifier of Ontologese as the one they just used to raise that question. And *this* sort of privilege—the privilege of being the appropriate quantifier to use in asking the intuitive question of what is "really out there"—seems entirely different from the privilege of maximal sensitivity.

8. Varieties of quantifier variance

According to the "mereological" variety of quantifier variance we have been considering so far, the variation between quantifier meanings is a matter of how ultimate entities may be composed or decomposed. But there are other varieties.

Consider, for instance, the kind of quantifier variance defended by Kit Fine (2007). Now, Fine doesn't use the phrase "quantifier variance". What he defends is a "postulational" account of the existence of mathematical objects, which is meant to underwrite both the common mathematical practice of freely introducing new mathematical objects and also an indefinite-extensibility solution to the set-theoretic paradoxes. However, his view can be seen as a form of quantifier variance, since his conception of indefinite extensibility is that no matter how the quantifiers are currently being understood, we could always understand them more broadly, to include further entities, namely sets whose members were in the range of the initial understanding of the quantifiers. And in fact, Jared Warren (2017) has developed an account of indefinite extensibility that is explicitly premised on quantifier variance.

Clearly the Finean quantifier-meanings do not result from different choices of which "portions of reality", resulting from composition and decomposition from subatomic particles, to count as entities. Moreover, although the matter needs further careful investigation, it seems intuitively clear that any view of this sort could not be combined with a transcendent conception of concepts, since if quantifiers can recognize "arbitrarily many entities", there presumably can be arbitrarily many concepts, and thus there could not be a single, language-independent, conception of a concept. The domain of concepts itself would be indefinitely extensible.

Consider next a kind of quantifier variance that can be coupled with "permissivism" about ontology. Ordinary talk is, on the surface anyway, full of apparent ontological commitment to all sorts of nonphysical entities. The previous sentence, for example, seems to quantify over or refer to "ordinary

talk", a "surface", an "apparent ontological commitment", and "sorts". Perhaps some of this is somehow marked by natural language as not being genuinely quantificational or referential, but surely a healthy residue remains. Regarding the residue, one might take a permissive view. There do in fact exist such entities as sorts and surfaces—and agreements, marriages, visages, ways to change the oil or win a chess match, states of panic (Thomasson, 2015, p. 102), and so on. So long as a practice of using quantificational language is inferentially appropriate, its existential sentences are true. And one way of justifying this libertine approach appeals to quantifier variance. A coherent practice of using quantificational sentences is bound to issue in truths because the adoption of the practice singles out a meaning for the quantifiers under which the sentences are true. Different practices result in different quantifier meanings.

The neoFregean approach to mathematical ontology can also be coupled with a related form of quantifier variance. Suppose we begin by speaking of lines in physical space. According to neoFregeans, we may then introduce further entities, the *directions* of these lines, by stipulating this principle as a definition: "The direction of one line is identical to the direction of another line if and only if the lines are parallel". (The idea isn't to identify directions with equivalence classes of lines; the putative definition of directions is not supposed to rely on a prior acceptance of classes.) Similarly, "Hume's Principle", according to which the number of one concept is identical to the number of another concept iff the concepts are equinumerous, is seen as a definition of number, capable of serving as the foundation for arithmetic. But what guarantee is there that such "abstraction principles" can always be stipulated? After all, they imply the existence of new entities (directions, numbers). A natural answer relies on quantifier variance.[24] There is a range of possible quantifier meanings; laying down an abstraction principle is selecting one of them (or a class of them) under which the principle comes out true. Thus Hume's principle, for instance, is an implicit definition both of 'number of' and also the quantifiers (both first- and second-order) that it contains. (This outlook, notice, yields a solution to the problem of individually consistent but jointly inconsistent abstraction principles: the principles are true under distinct quantifier-meanings.)

[24]See Sider (2007) for this conception of neoFregeanism. NeoFregeanism's chief proponents have, I am afraid, emphatically rejected it (Hale, 2007; Hale and Wright, 2009). See Hawley (2007) for more criticism, and Warren (2020, chapter 9) in support—indeed, in defense of the more general claim that a wide range of "deflationary" approaches to ontology rely on quantifier variance. And permissivism's chief proponent, Amie Thomasson (1998; 2007; 2015), has also emphatically rejected the quantifier variance conception (2015, chapter 1).

NeoFregean and permissivist quantifier variance seem quite different from the mereological variety. The differences between neoFregean or permissivist languages are not a matter of which "portions of reality", rooted in subatomic particles, count as objects. For directions, numbers, propositions (introduced by an abstraction principle saying that synonymous sentences are associated with the same proposition, as in Schiffer (2003)), states of panic, ways to change oil, marriages, the surface of ordinary talk, …—none of these objects is sufficiently spatially localized to identify with any particular "portion of reality".

There is also an apparent tension between neoFregean and permissivist quantifier variance and the transcendent conception of concepts—and with the transcendent conception of entailment with which it's naturally paired. Consider two neoFregean languages, one in which Hume's principle has been stipulated and another in which the directions principle has been stipulated, and suppose someone asks whether the numbers that are discussed in the first language are the same as the directions that are discussed in the second. Such questions would seem to be misguided (at least if neither language stipulates answers to them—assume this for the sake of argument). Now, the question "is any direction identical to any number?" is misguided for a surface reason: it employs a quantifier that isn't that of either of the two languages. However, if 'the number of' in the first language and 'the direction of' in the second signify two of a common stock of concepts, over which there is a transcendent notion of entailment, then at a deeper level the question would seem not to be misguided at all. For then, there would presumably be an answer to the question of whether the first concept entails the negation of the second concept; and this question is a sort of concept-theoretic counterpart to the question of whether a number could be a direction. If the entailment holds, we could not introduce a third language in which 'number of' and 'direction of' mean what they mean in the first two languages, respectively, and in which some sentence of the form "the number of concept c is identical to the direction of line l" is true. But if the entailment doesn't hold, then there is no barrier to introducing such a language. Thus there is a fact of the matter on which the possibility of introducing such a language turns. Similarly, if permissivist languages draw from a common stock of transcendent concepts governed by a transcendent notion of entailment, then there would seem to be answers as to whether the concept *magisterial demeanor* from one language entails the negation of the concept *stern visage* from another, and thus there would be a fact of the matter whether one can introduce a language that, so to speak, identifies some demeanors in the sense of the first language with some visages in the

sense of the second. Admitting facts of the matter of these sorts clashes with the neoFregean and permissivist picture of ontology as a realm of stipulation rather than discovery.

Here is a related way to bring out the tension. Just as it is natural to pair the transcendent conception of concepts with a transcendent conception of entailment, it is also natural to pair it with a transcendent notion of *inclusion*, which is a contingent counterpart of entailment—what entailment demands of a given possible world.[25] In picture-thinking, concept d is included in the concept d' iff *in fact* every d-ish portion of reality is d'-ish; more rigorous glosses would depend on the language: "all ds are d's" in a large language, "any simples arranged d-wise are also arranged d'-wise", perhaps, in a smaller language. We can now argue as follows. If distinct neoFregean or permissivist languages shared a common notion of concept, they ought also to share a common notion of inclusion. Thus there should be a fact of the matter whether, for instance, the concept number-of from one neoFregean language includes the concept direction-of from another, or whether the concept demeanor from one permissivist language includes the concept visage from another. But such facts surely should not be recognized, for they would in essence be facts about whether any numbers "really are" directions, or whether any demeanors "really are" visages.

These tensions can be resolved by saying that the concepts involved in neoFregean and permissivist quantifier variance are immanent, not transcendent. There is no single conception of "worldly structure"—at least, not at a subpropositional level—to which the concepts in different neoFregean or permissivist languages are all sensitive. Rather, each such language has its own distinctive set of concepts (and associated notion of entailment), which are tied to that language's quantifier-meanings.[26] (As for the collapse argument, concepts being immanent enables my earlier preferred response: quantifier-meanings from one language are never defined on concepts from another.)

This is not the only way to dissolve the tension.[27] One might instead retain the transcendent conception but claim that predicates like 'number', 'direction', 'visage', 'demeanor', and the like are highly indeterminate. This, too, would block there being a fact of the matter whether numbers really are directions

[25]It would be similarly natural to recognize transcendent relations of overlap, disjointness, and so forth.

[26]Similar remarks apply to permissivism or neoFregeanism based on inegalitarian quantifier variance.

[27]Thanks to Cian Dorr for discussion of this issue.

or visages really are demeanors. For entailment (or inclusion) relations might hold on some but not all precisifications of 'number' and 'direction'. The indeterminacy would be tied to the fact that ordinary use of these and other such terms lays down merely "structural" constraints. Although these constraints insure that certain sentences are true under all precisifications (for instance, 'the number of planets is distinct from the number of current presidents of the United States'), they leave massively open which particular concepts are denoted. (Compare the idea that any ω-sequence whatsoever could count as "the natural number sequence".)

Thus there are two viable approaches: one on which mathematical and permissivist predicates refer (more or less) determinately to immanent concepts, and another on which they refer extremely indeterminately to transcendent concepts. But note that the structuralist/massive-indeterminacy approach to ordinary and mathematical ontology doesn't need quantifier variance at all. It could just as well be implemented under a non-variantist meta-ontology. On this view, 'number', 'visage', and the like are highly indeterminate (though "structurally uniform") over concepts of entities in the One True Ontology.

In my view, Hirsch's core texts can be read, in the first instance, as a defense of mereological quantifier variance. Now, distinguishing his view so sharply from permissivist and neoFregean quantifier variance might seem to conflict with the fact that he has long emphasized the primacy of full sentences in radical interpretation, which is reminiscent of neoFregeans' emphasis on the context principle. Indeed, he has recently, along with co-author Warren, used the phrase "top down" (i.e., sentences-before-subsentences) to emphasize this meaning-as-use aspect of his view (Hirsch and Warren, 2019, p. 349). But we should distinguish an interpretational (or metasemantic) top-down/bottom-up contrast from a metaphysical one.[28] My contrast between mereological versus neoFregean/permissivist quantifier variance is indeed a bottom-up versus top-down contrast, but it is intended to be a metaphysical one: does the objective world have relevant sub-propositional structure on which all languages agree? One can combine an affirmative answer to that question, thus accepting mereological quantifier variance, while still accepting a top-down approach to metasemantics, and holding that the interpretation of quantifiers and singular terms is ultimately derived from how we use entire sentences.[29] So I think

[28]Thanks to Jared Warren here.

[29]However, my own view is that objective wordly sub-propositional structure, once recognized, should also be seen as playing a metasemantic role, alongside the role for whole

it is at least open to Hirsch to accept the mereological variety of quantifier variance.[30]

References

Belnap, Nuel D. (1962). "Tonk, Plonk and Plink." *Analysis* 22: 130–4.

Button, Tim (2013). *The Limits of Realism*. Oxford: Oxford University Press.

Carnap, Rudolf (1950). "Empiricism, Semantics and Ontology." *Revue International de Philosophie* 4: 20–40. Reprinted in *Meaning and Necessity: A Study in Semantics and Modal Logic*, 2nd edn. University of Chicago Press, Chicago.

Chalmers, David J., David Manley and Ryan Wasserman (2009). *Metametaphysics*. Ed. David J. Chalmers, David Manley and Ryan Wasserman. Oxford: Oxford University Press.

Dorr, Cian (2005). "What We Disagree About When We Disagree About Ontology." In Mark Eli Kalderon (ed.), *Fictionalism in Metaphysics*, 234–86. Oxford: Oxford University Press.

— (2014). "Quantifier Variance and the Collapse Theorems." *The Monist* 97: 503–70.

— (2016). "To Be F is to Be G." *Philosophical Perspectives* 30(1): 39–134.

Fine, Kit (2007). "Relatively Unrestricted Quantification." In Agustín Rayo and Gabriel Uzquiano (eds.), *Absolute Generality*, 20–44. Oxford: Oxford University Press.

Goodman, Nelson (1978). *Ways of Worldmaking*. Indianapolis: Hackett.

Hale, Bob (2007). "Neo-Fregeanism and Quantifier Variance." *Proceedings of the Aristotelian Society* 107: 375–85.

Hale, Bob and Crispin Wright (2009). "The Metaontology of Abstraction." In Chalmers et al. (2009), 178–212.

sentences on which the meaning-as-use approach relies. Note that Lewis's own version of reference magnetism is exactly of this mixed sort (Lewis, 1984).

[30]Though presumably not Warren, whose quantifier variance is more of the neoFregean variety.

Harris, J. H. (1982). "What's so Logical about the Logical Axioms?" *Studia Logica* 41: 159–71.

Hawley, Katherine (2007). "Neo-Fregeanism and Quantifier Variance." *Aristotelian Society, Supplementary Volume* 81: 233–48.

Hirsch, Eli (2002). "Quantifier Variance and Realism." *Philosophical Issues* 12: 51–73. Reprinted in Hirsch 2011: 68–95.

— (2011). *Quantifier Variance and Realism: Essays in Metaontology*. New York: Oxford University Press.

Hirsch, Eli and Jared Warren (2019). "Quantifier Variance." In *The Routledge Handbook of Philosophy of Relativism*, 349–357.

Lewis, David (1984). "Putnam's Paradox." *Australasian Journal of Philosophy* 62: 221–36. Reprinted in Lewis 1999: 56–77.

— (1986). *On the Plurality of Worlds*. Oxford: Blackwell.

— (1999). *Papers in Metaphysics and Epistemology*. Cambridge: Cambridge University Press.

Pelletier, Francis Jeffry and Allen Hazen (2021). "Natural Deduction Systems in Logic." Stanford Encyclopedia of Philosophy. Available at `https://plato.stanford.edu/archives/win2021/entries/natural-deduction/`.

Putnam, Hilary (1987*a*). *The Many Faces of Realism*. La Salle, IL: Open Court.

— (1987*b*). "Truth and Convention: On Davidson's Refutation of Conceptual Relativism." *Dialectica* 41: 41–67.

Schiffer, Stephen (2003). *The Things We Mean*. Oxford: Clarendon Press.

Sider, Theodore (2007). "Neo-Fregeanism and Quantifier Variance." *Aristotelian Society, Supplementary Volume* 81: 201–32.

— (2009). "Ontological Realism." In Chalmers et al. (2009), 384–423.

— (2011). *Writing the Book of the World*. Oxford: Clarendon Press.

— (2013). "Against Parthood." In Karen Bennett and Dean W. Zimmerman (eds.), *Oxford Studies in Metaphysics*, volume 8, 237–93. Oxford: Oxford University Press.

— (2020). *The Tools of Metaphysics and the Metaphysics of Science*. Oxford: Oxford University Press.

Thomasson, Amie L. (1998). *Fiction and Metaphysics*. Cambridge University Press.

— (2007). *Ordinary Objects*. New York: Oxford University Press.

— (2015). *Ontology Made Easy*. New York: Oxford University Press.

van Cleve, James (1986). "Mereological Essentialism, Mereological Conjunctivism and Identity Through Time." In Peter French, Theodore E. Uehling, Jr and Howard K. Wettstein (eds.), *Midwest Studies in Philosophy XI: Studies in Essentialism*. Minneapolis, MN: University of Minnesota Press.

van Inwagen, Peter (1990). *Material Beings*. Ithaca, NY: Cornell University Press.

Warren, Jared (2015). "Quantifier Variance and the Collapse Argument." *Philosophical Quarterly* 65(259): 241–253.

— (2017). "Quantifier Variance and Indefinite Extensibility." *Philosophical Review* 126(1): 81–122.

— (2020). *Shadows of Syntax*. New York: Oxford University Press.

— (2022). "Quantifier Variance, Semantic Collapse, and 'Genuine' Quantifiers." *Philosophical Studies* 179: 745–57.