Quantifier Variance

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Abstract

Quantifier variance is a prominent approach to contemporary metaontology that is noted for leading to a deflationary view of ontological debates. Here we explain the metasemantics of quantifier variance and distinguish between modest and strong forms of variance (Section I), explain some key applications (Section II), clear up some misunderstandings and address objections (Section III), and point the way toward future directions of quantifier-variance-related research (Section IV).

I. What is Quantifier Variance?

Different possible languages have different concepts of what "exists" or what "there is". Despite this key difference between them, some of these languages are equally good as tools for describing reality. These are two of the central claims of *quantifier variance*, a highly influential deflationary view in contemporary metaontology. Variance is rooted in widely accepted metasemantic principles, yet it remains controversial, since it deflates the pretensions of philosophical ontology. Additionally, variance is very widely misunderstood. A proper understanding starts with the metasemantic background leading to variance, in both of its principle forms.

Language and Meaning. Linguistic meaning is determined by actual and possible language use. Taken baldly, this is almost a truism. But more plausibly, this slogan about use expresses a commitment to *charity* in interpretation. Minimally, charity ties meaning to use by ruling out interpretations that see those we are interpreting as uttering falsehoods inexplicably.

Say that an *interpretation* of language *L* assigns coarse-grained truth conditions to sentences of *L* relative to each possible context of utterance. Coarse-grained truth conditions can be modeled as sets of possible worlds (Stalnaker 1984); and these functions from contexts of utterance to coarse truth conditions are called "characters" (Kaplan 1989). A charity-based metasemantics assigns *L* the interpretation that, when all is said-and-done, when every disposition to correct and revise is accounted for, makes the best sense of the linguistic behavior of *L*-speakers by making their considered utterances come out true in actual and possible circumstances, *ceteris paribus*.

Charity-based approaches are *top down* – they explain the meanings of subsentential expressions in terms of the meanings of whole sentences. Once again this respects the dictum that meaning is use, as the meanings of subsentential expressions will be fully explained in terms of their usage in the language. By contrast, *bottom up* theorists start with the meanings of subsentential expressions and then go on to explain the meanings of sentences in terms of them. To top down theorists, this is mysterious — what magic could attach meaning to a subsentential expression apart from its use?

Quantifier Expressions. What makes an expression in a given language a "quantifier" on a charity-based, top down approach is that it is *used as* a quantifier. The inferential role of a quantifier expression is its defining feature — an expression in a given language is an existential quantifier, for instance, if it plays the inferential role of an existential quantifier in that language. No doubt the inferential role of "there is" or "exists" in natural language is more complex than the role of "∃" in formal logical languages, but the formal-syntactic role of "∃" provides a tidy approximation of the informal inferential role of "exists" or "there is" in English. The expression "there is" is an existential quantifier, in English, roughly because for name "*a*" and predicate "*F*", from "*a* is *F*", "there is an *F*" follows; and if a non-"a" claim follows from "a is *F*", with no auxiliary assumptions made about "*a*", then that same thing also follows from "there is an *F*". Expressions that obey this role unrestrictedly, for all names and predicates that could be introduced into the language, express the language's unrestricted concept of existence.

Combining a top down charity approach to meaning with the inferential role priority account of what it is to be a "quantifier" results in a deflationary metasemantics for quantificational claims. This metasemantics entails *modest quantifier variance*. Call a language with quantifier expressions a "quantifier" language. All human languages are quantifier languages, and maybe all possible languages are; our terminology is neutral on this. Modest variance says that there are many *distinct* quantifier languages — quantifier languages where translating one language's quantifier into the other's results in massive failures of charity. This follows almost immediately from top down charity and our account of quantifiers. Obviously there are many possible patterns of language use, distinct from each other but each with expressions playing the role that "there is" plays in English (of course, related expressions like "refers" and "object" will likewise vary in meaning between distinct quantifier languages, and variation in the meaning of the referential apparatus of the language will induce variation in the meaning of ordinary predicates like "red" and "on" as well).

Quantifier variance is often associated with a deflationary view of philosophical ontology, so we must stress that modest variance is not necessarily hostile to ontology. In fact, several prominent contemporary ontologists, including Cian Dorr (2005) and Theodore Sider (2009), count as modest variantists by our reckoning. The anti-ontological arguments associated with quantifier variance rely on a stronger form, one that builds upon modest variance. This stronger form must now be explained.

Equivalent Descriptions. Languages are, among other things, tools for describing the world. And like most tools, languages can be better, worse, or equal for the task at hand. When two languages are equal for any possible descriptive task, we say that the languages are *equivalent*, and that, informally, despite any differences between them, that they describe the very same facts or states of affairs. The top down charity approach allows for a simple account of language-wide equivalence — two languages are equivalent just in case they can express all and only the same characters, the same functions from contexts to coarse-grained truth conditions. When languages are equivalent in this sense, then for any sentence in the language of one, there is a

sentence in the language of the other that is true in all and only the same possible circumstances.

This provides a very natural sense in which speakers of each language can express all and only the same facts. There is no state of the world, considered in a coarse-grained sense, that speakers of one language but not the other are sensitive to. Of course, each language may well describe these states of the world in apparently incompatible ways, using their own idiosyncratic notions. But what could it mean to say that one of these ways of describing things was closer to the truth than the other, when they are both *literally true*, in their home language? It is difficult to see how one of a pair of equivalent languages could be a better description of reality than another. Of course, there are fine-grained notions of equivalence that distinguish between character-wise equivalent languages, but when considered merely as tools for describing reality, this doesn't seem to matter.

Metaphysical Merit. Accepting that equivalent languages are of equal metaphysical merit, along with modest variance, leads to *immodest* or *strong quantifier variance*. Strong variantists endorse an egalitarian version of the pluralism about quantifier languages endorsed by modest variantists. Strong quantifier variance applies to quantifier languages the general thought that truth-conditionally equivalent languages are equally good, *metaphysically speaking*. It claims that when two quantifier languages are equivalent, there is no use asking which of them is metaphysically better or which better reflects objective reality. Nothing else about the metaphysical ordering of languages is implied; but for strong variantists, if there is a single, metaphysically special language, it can only be because that language can express truth conditions inexpressible in any other language. Of course, while strong variance is *metaphysically* egalitarian, it is not egalitarian in any stronger sense. Variantists can allow there are often important practical reasons for preferring one quantifier language over an equivalent language.

Strong quantifier variance takes the quantifier language pluralism of modest variance and adds to it an account of the metaphysical merit of languages in terms of

their truth-conditional equivalence. Variance, both modest and strong, is interesting in itself, but it can also be applied in philosophically fruitful ways.

II. Applications of Quantifier Variance

Here we explain five of quantifier variance's most important philosophical applications.

Merely Verbal Disputes in Ontology (Putnam 1987, 2004, Hirsch 2008*a*, 2009). According to modest variance, for many ontological disputes, there are possible languages associated with each side in the dispute that make the typical assertions of that side come out true. So there is a possible language N in which the standard assertions of mereological nihilists come out true, and a possible language U in which the standard assertions of mereological universalists come out true. There is no metasemantic glue sticking words to meanings, so if philosophers depart drastically enough from standard usage, and refuse to coordinate or defer to other speakers, we should attempt to interpret them on their own terms. When we do this, charity supports the claim that nihilists are speaking N and universalists are speaking U. Since these philosophers are speaking different languages, their dispute over whether there are chairs is *merely verbal*: they each speak the truth in their own language and thus talk past each other.

They could attempt to reinstate their dispute by touting the superiority of their own language, whether N or U, over the other, metaphysically speaking. But for standard ontological disputes, including this one, the relevant languages are truth-conditionally equivalent. So, according to strong variance, N and U will also be of equal metaphysical merit. This means that there is nothing factual distinguishing these two languages — each theorist speaks the truth in their own language and each competing language is an equivalent description of the very same facts. There is no reason to prefer one language over the other, metaphysically speaking. This provides a second sense in which the dispute is "merely verbal".

Ordinary Ontology (Hirsch 2003, 2005). English speakers innocent of philosophy reject the distinctive claims of mereological nihilists and mereological universalists alike. But English-speaking ontologists seem untroubled by this, apparently thinking that since

there is only one thing for "exists" to mean, ordinary English claims about material objects cannot be charitably interpreted. According to modest quantifier variance, this is false — there is a quantifier language in which the material object claims made by English speakers come out true. Charity demands that we interpret English speakers as speaking this language, so that, in English, "there are turkeys" and "there are trout" are both true, while "there are trout-turkeys" is false. Since this natural language concept of existence does not perfectly correspond to any of the standard positions in debates about material objects, if participants in these debates are speaking English, they are often speaking falsely. Strong variantists will add that, since it is plausible that English is equivalent to N, U, and the other languages of metaphysicians, English itself is a perfectly legitimate quantifier language, metaphysically speaking.

Vagueness about Existence (Hirsch 1999, 2002). It is widely believed that existence claims cannot be vague. This is because vagueness is usually thought to be a matter of *semantic indecision* — there are various possible things we could mean by a term like "bald", but our usage of the term doesn't decide between all of them, so the term is vague. Given this picture of vagueness, some philosophers (Lewis 1986) have argued that since there is only one possible thing that could be meant by "exists", existence claims cannot possibly be vague. But once quantifier variance is accepted, we can easily see how there could be semantic indecision and vagueness over "exists": our usage could fail to decide between various assignments of truth conditions to sentences containing "exists", while on each assignment "exists" continues to play the same formal-syntactic role and thus remains a quantifier.

Mathematical Freedom. (Berry 2015, Warren forthcoming). Mathematicians freely introduce theories about new kinds of mathematical entities. If a mathematician introduces a new kind, the *F*s, it would be inappropriate within mathematics to object that no evidence had been given that *F*s exist (provided at least that the assumption of *F*s is consistent). On bottom up views of the metasemantics of quantifiers this procedure is either epistemically reckless or wholly inexplicable. However, as was perhaps first recognized by Carnap (1934), quantifier variance makes sense of

mathematical freedom — mathematicians are introducing new ways of using sentences containing "there are" and "exists". Charity to use demands that we interpret them as speaking truly, if we can. And as quantifier variantists, we can. In this way, variance rationalizes standard mathematical practice by making explicable its ontological freedom. Other approaches to metaontology are forced to criticize the internal norms of mathematics on purely philosophical grounds.

Paradoxes and Indefinite Extensibility. (Warren 2017). Naïve set theory is beset by paradoxes, most famously Russell's paradox concerning the set of all non-self-membered sets. One response to these paradoxes, inaugurated by Russell himself, sees set-theoretic quantifiers like "all sets" as being *indefinitely extensible*. The idea being that when you attempt to quantify over all and only the sets you somehow, someway, end up being able to talk about another set that was not in the original collection. This idea has long been puzzling, since clearly we aren't *creating* a new set when we run through the reasoning of the Russell paradox! But quantifier variance makes sense of extensibility by seeing the Russell reasoning as creating not a new set, but rather a new and slightly expanded concept of "all sets", based on a slight change in the usage of sentences containing "all". In this fashion, variance provides an all purpose strategy for demystifying the hitherto puzzling paradoxes of set theory and absolute generality.

III. Misunderstandings and Objections

There are many ways to *misunderstand* quantifier variance, most of them witnessed in the literature. For the sake of clarity, let us make fully explicit some of what is merely implicit in the foregoing.

Quantifier Variance is not anti-realism. Ontological anti-realists think that, in some fashion or other, objects depend for their existence on human practices. But while it is undeniable that some objects depend upon humans (governments, national borders, thoughts), it seems equally undeniable that other objects do not (stars, rocks, numbers). Nothing in quantifier variance conflicts with this bit of good sense. In fact, while variance says much about the nature of our *concept* of existence, it says *nothing at all* about the nature of the things that exist (Hirsch 2002). To reason from quantifier

variance to ontological anti-realism is just as confused as reasoning from the human invention of the concept of "planet" to the human invention of planets.

Quantifier Variance is not verificationism. Verificationists think that claims are only meaningful if they have clear verification conditions. This is usually understood as entailing that disputes are substantive just in case they can be settled, in principle. The logical positivists of legend used verificationism as a club with which to bash metaphysics, and some (Hawthorne 2009, for example) have worried that variantists are wielding the same club for the same purpose. But this is mistaken; strong variantists think disputes are metaphysically insubstantial when each side's language is equivalent to the other. This criterion only entails verificationism if "equivalent to" is understood to mean, "has the same verification conditions as", but as we have seen, this is not how quantifier variantists understand "equivalence" (Putnam 1983, Hirsch 2011, 2016, Warren 2015 appendix). Unlike verificationism, the charity-based metasemantics behind quantifier variance allows that many substantive disputes — some disputes about the past, for example — may forever be impossible to settle.

Quantifier Variance does not venerate quantification. Some think that variantists must mean something *special* by a "quantifier", beyond obeying a particular formal-syntactic role. A persistent version of this confusion says that variantists must explain different quantifier meanings in terms of differing *domains of quantification* (Finn and Bueno 2018). Obviously this is a nonstarter — speakers of N cannot and do not admit that U's quantifiers range over a domain containing composites (charitable critics of variance, such as Sider (2009), recognize this). There are also more subtle ways to read something special into "quantifier" variance (Dorr 2014). But whether expressed simply or subtly, the thought is wrong. Those who think that something more than formal-syntactic role is required for an expression is to count as a "real" quantifier should interpret our claims as concerning only *quantifier-like* expressions — expressions that have the same formal-syntactic role as our quantifiers. Everything that is of interest to variantists can easily be said using this alternative vocabulary, though we think that

talking in terms of quantifier *variance* rather than quantifier *elimination* is much more natural and suggestive (Hirsch 2011 introduction).

Even with these misunderstandings avoided, quantifier variance and its applications have been challenged in the literature. Three of these challenges warrant some discussion.

The Collapse Argument (Hale and Wright 2009, Dorr 2014, Rossberg unpublished). Imagine that we quantifier variantists are speaking N and considering U. As variantists, we admit that the sentence "Bugs is a bunny" is, while false in N, true in U. But (it is claimed) admitting that it is true in U that Bugs is a bunny, entails, by the inferential role of our N-quantifier, that, *something* (in our N-sense of "something") is a bunny. Which — since bunnies are composite objects — contradicts the assumption that we were speaking N. It seems that N is not a possible language and modest variance is false.

This argument, based on one given in Harris 1982, has tempted many critics of variance. But it is based on a confusion: admitting, in N, that "Bugs is a bunny" is true in U, is not tantamount to admitting, in N, that Bugs is a bunny. To think otherwise is to confuse use and mention. In a language that calls sharks "dogs" but is otherwise exactly like English, "dogs live in the water" is true. We can all see that this does not imply, *in English*, that dogs live in the water, but the mistake made by this brainless argument seems to be the very mistake made by the collapse argument. Discussing the language U, within N, is very different than having, *within N*, the true sentence, "Bugs is a bunny". Intra-language versions of collapse, though valid, don't threaten quantifier variance, while inter-language versions threaten quantifier variance, but are fallacious (Warren 2015). The fallacy has only escaped notice because the argument is typically presented formally, in either a natural deduction system or a mathematically powerful metatheory. But a fallacy is still a fallacy, no matter how many technicalities are piled on top of it.

The Tarskian Argument (Hawthorne 2006, Eklund 2009). Imagine again that we variantists are speaking N and considering U. As variantists we should be able to freely

admit that U is a possible language, in some general sense (we are not presently concerned with its psychological possibility). But according to many influential approaches in the philosophy of language and linguistics, claiming a natural language possible requires the ability to formulate a Tarski 1933 style semantic theory for that language. And this seems impossible for the "smaller" language to do in the cases of interest to variantists. For example, a Tarski-style treatment of U, within N, would explain the truth of the U-sentence "Bugs is a bunny" by saying that the referent of "Bugs" has the property expressed by "is a bunny". But there is, according to N-speakers, no suitable referent for "Bugs", since "is a bunny" has empty extension, and so a Tarski-style approach seems impossible. If this is right, then N-speakers cannot admit that U is a possible language, contradicting modest variance.

In response, some (Dorr 2005, Sider 2007) have advocated that variantists reject the standard Tarskian approach to semantics, at least as a constraint on admitting a language possible. We are sympathetic to this suggestion, but have elsewhere shown that it is not strictly required (Hirsch and Warren forthcoming). Through devious uses of the resources of set theory, N-speakers can give a perfectly standard — though complicated — Tarskian semantics for U without going beyond the resources of N. This completely undermines this particular version of the Tarskian argument, and it is plausible that similar results also hold for all other cases of interest.

Heavyweight Ontology (Sider 2001 introduction, 2009, 2011, Fine 2001, 2009). Following Quine (1948), quantifier variantists see existential quantification over *F*s as expressing *ontological commitment* to *F*s. This is still widely but not universally accepted in philosophy. Recently many metaphysicians have claimed that even if existential quantifiers carry some kind of "lightweight" ontological commitment, what ontologists really care about is "heavyweight" ontological commitment, which is not carried by standard quantifiers alone. There is disagreement over the particulars, but most of these heavyweight ontologists think ontological commitment is carried by some sort of special metaphysical primitive such as "in reality" or the like — for example by saying that ontological commitment to *F*s is expressed by the claim that, in reality, there are *F*s.

With this type of move made, there no longer seems to be any reason for ontologists to worry about quantifier variance or deflationary arguments based upon it.

Despite the recent popularity of this strategy, it is difficult to see how it, alone, could salvage substantive ontology. Either sentences containing "in reality" (or the like) have clear truth conditions in the language of heavyweight ontology, or they do not. If they do, then the situation is not importantly different than it was with the quantifiers — we are able to charitably interpret each disagreeing heavyweight ontologist so that they speak the truth in their own language and thus all talk past each other (Hirsch 2008*b*). On the other hand, if these sentences do not have clear truth conditions, then ontological claims, questions, and disputes are problematic *for that very reason* (Warren 2016). In neither case has substantive ontology been rehabilitated. The devil is in the details, but this general situation makes us highly skeptical about the prospect of rehabilitating substantive ontology simply by moving away from quantifiers as the source of serious ontological commitment.

IV. Future Directions

Here we indicate four directions for future quantifier-variance-related work. Of course, our list does not exhaust the possibilities.

Strange Languages. Variantists think that there are possible languages that have distinct concepts of "what exists." But are there any limits on how intuitively *strange* such alternative languages can be? Some quantifier languages are bizarre, such as Hirsch's Contacti language, where the identity of an "object" over time is partly determined by its contact relations to other things, so that if two "objects" come into contact with each other they exchange all of their properties including their spatial locations and material composition (see Hirsch 1993 for details). Can we really conceive of any beings speaking Contacti as their mother tongue? Can we conceive of beings using a language like this *at all*? Contacti is a describable language (we have just described it), and what's more it seems that it is truth-conditionally equivalent to our language, so for anything we can say, they can say something to the same effect. It is not clear, therefore, what the nature of the intuitive difficulty is in imagining speakers of

such a language. Nor is it clear whether the intuitive difficulty is a real difficulty. But variantists should acknowledge the insistent intuitions about such cases and attempt to account for them, in some fashion. There may be plausible metasemantic principles that exclude certain describable quantifier meanings while admitting others. The matter calls for further investigation, with quantifier variance kept firmly in mind.

Human Limits. The question we have just been sketching concerns the possibility of beings, whether human or not, speaking languages with wildly different concepts of existence than ours. A related question is whether *humans* could be raised to speak such languages, as their mother tongue. This may be principally an empirical question, informed by matters of psychology and neuroscience, but there is much in it that is grist for philosophical reflection. Many of the alternative languages are truth-conditionally equivalent and so express the same facts as our own, but are there deep connections, perhaps even *a priori* connections, between how our concept of existence articulates the facts and how human patterns of attention and learning operate? A start on these questions has been provided by Hirsch (1978, 1997, unpublished), but further work in this area would be valuable.

Hyperintensionality and Meaning. The metasemantics of quantifier variance is avowedly *intensional* — it makes no direct appeal to differences in meaning between necessarily equivalent sentences or expressions. Some critics (Hawthorne 2009) have seen this as an objection to quantifier variance. We disagree (see Hirsch 2016), but think that the connection between so-called *hyperintensionality* and quantifier variance needs further exploration, along a number of dimensions. One of these dimensions concerns cross-language belief ascriptions. Suppose that in the presence of a brown dog and a green turtle a speaker of U asserts the true U-sentence, "There is something here that is partly brown and partly green." Assuming that this sentence is false in our language, it does not seem that we have any sentence in our language that is synonymous with this true U-sentence. It may follow that English speakers cannot capture the fine-grained hyperintensional content of the belief expressed by the speaker of the U-language. We

do not think this as a major problem for variance, but both the general and specific issues deserve further clarification.

Beyond Philosophical Ontology. Naturally enough, the original applications of quantifier variance were aimed at demystifying the ontological disputes engaged in by philosophers. But philosophers don't have a monopoly here — existence claims and questions are woven into nearly every aspect of our approach to the world. Because of this, quantifier variance can be applied to many areas of human discourse, potentially resolving various puzzles and eliminating confusions. As noted above, this has been done in mathematics, leading to satisfying accounts of both mathematical freedom and the paradoxes of set theory. It is worth investigating what results when quantifier variance is applied to discourse about and within fiction, debates about species and natural kinds in biology, discussions of social-biological kinds like race and gender, theoretical posits in science, the posits of folk psychology and cognitive science, and beyond. Assuming that quantifier variance is the correct approach to our concept of existence, it will be applicable to existential claims in all of these areas and, as has already been the case with mathematics, some of the applications may be philosophically illuminating.

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