A DEFLATIONIST ERROR THEORY OF PROPERTIES

Arvid Båve, Hamburg/Gothenburg

Abstract
I here defend a theory consisting of four claims about "property" and properties, and argue that they form a coherent whole that can solve various serious problems. The claims are: (1) "property" is defined by the principles (PR): "F-ness/Being F/etc. is a property of x iff F(x)" and (PA): "F-ness/Being F/etc. is a property"; (2) the function of "property" is to increase the expressive power of English, roughly by mimicking quantification into predicate position; (3) property talk should be understood at face value: apparent commitments are real and our apparently literal use of "property" is really literal; (4) there are no properties. In virtue of (1)-(2), this is a deflationist theory and in virtue of (3)-(4), it is an error theory. (1) is fleshed out as a claim about understanding conditions, and it is argued at length, and by going through a number of examples, that it satisfies a crucial constraint on meaning claims: all facts about "property" can be explained, together with auxiliary facts, on its basis. Once claim (2) has been expanded upon, I argue that the combination of (1)-(3) provides the means for handling several problems: (i) they help giving a happy-face solution to what I call the paradox of abstraction (basically that "x has the property of being F" and "x is F" seem equivalent yet different in ontological commitments), (ii) they form part of a plausible account of the correctness of committive sentences, and, most importantly, (iii) they help respond to various indispensability arguments against nominalism.

In this paper, I want to defend a theory, (DEP), which is the conjunction of the following four claims:

(1)   *Deflationist claim 1*: the meaning of "property" is (roughly) captured by some de-nominalisation inference rule (like, "*a* is *F* ⇔ *F*-ness is a property of *a*").

(2)   *Deflationist claim 2*: the *raison d'être* of "property" is that it increases the expressive power of languages into which it is introduced.

(3)   *Face-value analysis of property talk*: Sentences containing "property" have just the

grammatical and logical forms they appear to have, and are typically used and interpreted literally (cf. Schiffer (2003, Ch. 1)).

(4)   *Nominalism*: There are no properties.

This theory is an *error theory* in virtue of the last two claims, which jointly entail that most claims speakers make using "property" are untrue. Claim (3) thus distinguishes (DEP) from its main nominalistic rivals, *paraphrase nominalism* and *hermeneutic fictionalism*, which are both intended to make speakers come out mostly right.

Claim (4) will not be positively supported in this paper, whose main aim is rather to argue that when combined with claims (1)-(3), it forms part of a plausible overall account. It also need not be much clarified, beyond the following: firstly, I take Nominalism to be the claim, also, that nothing is a property, i.e., I reject the "noneist" distinction between existential quantification and "there is" or "exist". Second, I assume that existential quantification, "there is", and "exist" are unambiguous. By contrast to claim (4), claims (1)-(3) all need lengthy clarification, which will be given in due course, along with substantial motivation.

Of course, it would be pointless to defend a conjunction of claims in a single paper (rather than one conjunct per paper, as it were) unless they were interestingly interconnected. An important purpose of this paper is therefore to show that the combination of claims (1)-(4) displays an attractive internal coherence, i.e., that they are mutually supporting in several important respects. In particular, I argue, claims (1)-(2) can be used to solve a number of problems, both problems arising for any theorist and problems afflicting error-theoretic nominalism (claims (3)-(4)). More specifically, I will argue that:

(i)   (DEP) (all four claims jointly) affords a "happy-face" solution to what I call the "paradox of abstraction".

(ii) (DEP) (in particular, claims (1)-(2)) provides an account of the *correctness* of sentences containing "property" (and possibly a generalisation to cover all abstract language).

(iii) (DEP) (in particular, claims (1)-(2)) affords responses to several charges to the effect that because "property" is useful, there must be properties (including the "indispensability argument").

I will also argue that claims (1) and (2), as spelt out below, form a coherent conjunction in that the meaning of "property" turns out to be just the way it should be, if "property" is to have the *raison d'être* I attribute to it.

The paper has two main parts, the first of which (Sections 1-4) clarifies and defends claims (1)-(3). More specifically, in Section 1, I briefly present the general meaning-theoretic and methodological assumptions I will rely on. On the basis of these preliminaries, I go on, in Section 2, to propose an account of the meaning of "property" clarifying claim (1) above. This account is put to the test in Section 3, where I try to make plausible that all use-facts about "property" can be explained on the basis of the account of the meaning of "property" presented in Section 2. Section 4 is devoted to clarify and expand on claim (2), about the *raison d'être* of "property". Sections 5-7 constitute the second part of the paper in which the benefits (i)-(iii) are discussed consecutively.

The paper's scope reaches outside the confines of (DEP) in at least two important respects: the analyses of the meaning and *raison d'être* of "property" are independent of nominalism and could equally be accepted by realists, and, although I have focussed on properties to keep things simple, many of my arguments will apply to other abstract notions (in particular, sets and numbers).

1. Meaning-theoretic and methodological preliminaries

The word "property" means *property*. But in virtue of what does this hold? The answer to this question will be of the form, "the expression *e* means *m* because…". This is indeed the format of my meaning individuation claim about "property". Though my account of meaning draws importantly on some ideas of Paul Horwich, there are also significant

differences. On his view, the meaning-constitutive facts about expressions are to the effect that speakers accept so-and-so. A simple shortcoming with this account is that it simply is not true that all speakers (of the relevant language) accept the sentences in question—only speakers who *understand* the expression do. Moreover, even if all and only speakers who understand "property" accept the relevant principles, but accepting them does not constitute their understanding "property", then the fact cannot constitute the meaning fact.

A revised account of meaning that takes these two points into account actually coincides in central respects with the theory of concepts proposed by Christopher Peacocke (1992). Just as he individuates concepts by giving their *possession conditions*, I will assume that what constitutes the fact that a given expression has the meaning it has is is that the expression has certain *understanding conditions*.

Thus, the meaning claim should be of the form:

(M)   *e* means *m* because for all *s*, *s* understands *w* iff …*s*…

To get a true sentence of the form (M), I will assume further, the sentence following "because" must express a fact about the expression *e* that is *explanatorily basic* with respect to *e*. This means that the fact must *explain*, together with auxiliary facts/laws— i.e., facts/laws *not* about *e*—all facts about the use of *e*. These use-facts are to the effect that competent speakers (are disposed to) accept such and such sentences (or do so under certain conditions). The "auxiliary facts/laws" will typically include various psychological generalisations, facts about what else speakers accept, and the meaning-constitutive understanding conditions of other expressions. Finally, the understanding conditions, too, will be to the effect that the speaker is disposed to accept such and such sentences, schemata, or inference rules (which will then be called *defining principles*).

These ideas, especially the explanatory constraint on meaning theories, have been defended at length by Paul Horwich (1998b, 2005), but I think many philosophers implicitly make similar assumptions about the explanatory role of meaning facts. A difference between Horwich's view and mine, however, is that whereas he requires that speakers' accepting the relevant principles to be explanatorily basic, I think the

understanding conditions are. The reason that the meaning-constitutive fact should have the specific causal-explanatory role described above is, in a nutshell, that this role fits our pre-theoretic, "Moorean" judgments about meaning.

An (M)-form claim is language-specific, since it concerns a particular expression of some language, and may also involve understanding conditions mentioning other expressions of that language. However, since words of different languages may mean *property*, a true (M)-form claim must always be true because the language-specific understanding conditions satisfy some more general, cross-linguistic, understanding condition constituting the expression's meaning what it means. Giving such general conditions means giving a claim of the form,

(M') For all *e* and *L*, *e* means *m* in *L* iff …,

where the understanding conditions mentioned in the right-hand side do not involve accepting principles containing expressions of any particular language. We will see that the (M)-claim concerning "property" to be proposed below suggests a reasonable (M')-form claim.

The notion of acceptance figures crucially in the present account. Acceptance is identified with a psychological (not behavioural), belief-like relation between speakers and sentences. I will also use "accept" in an extended sense, to speak of accepting sentence schemata and inference rules. To accept a schema is to accept its instances. To accept an inference rule is to be disposed to accept sentences that count as conclusions of the rule (for given sentences as premises) upon coming to accept the relevant premise sentence(s). All of these dispositions to accept must be assumed to have among their manifestation conditions that certain general "prompting factors" are present, in particular, that the speaker *consider* the relevant sentence(s), and perhaps more.

The acceptance dispositions that are necessary and sufficient for understanding an expression must be taken as *defeasible*, since competent speakers can always commit fallacies or consciously reject defining principles for theoretical reasons. Although they may fail to accept it, there must in every such case be an *inhibiting factor*, whether mere distraction, philosophical argument, or whatnot. In all such cases, the speaker will still be

competent as long as it is the case that *were* all inhibiting factors to be removed (and the right prompting factors present, e.g., consideration), then the speaker *would* infer in accordance with the principle.

I will propose that there are principles one simply must be disposed to accept in order to understand "property". This commits the account to a certain kind of analyticity. Philosophers who reject this (like Timothy Williamson (2007, 99ff.)) could, however, replace "if and only if" by "to the extent that". This allows for understanding to come in degrees and for a speaker to count as understanding even if she has no disposition to accept certain instances of the relevant principle. Of course, such understanding conditions would still grant a weak form of analyticity, namely, one which applies to a sentence if accepting it *counts toward* understanding of a given expression. I think my proposal could be replaced by this weaker one without much alteration of the other claims in this paper.

The account of the meaning of "property" is importantly constrained by claim (2), about the *raison d'être* of "property". For if "property" turns out to have defining principles not needed, or not sufficient, for allowing "property" to serve the function we identify as its *raison d'être*, then the latter identification is most likely false. The two hypotheses must thus cohere if their conjunction is to be accepted. At the end of Section 4, I will argue that my meaning hypothesis about "property", independently supported by its meeting the explanatory constraint stated above, indeed coheres in this way with my hypothesis about the *raison d'être* of "property".

The account of the meaning of "property" I will defend is of course meant to be consistent with (the semantic part of) claim (3), the "face value" analysis. This does not mean that everything I will say "lies on the face of it". But the claims I make which are not already obvious, I try to motivate on the basis of ordinary methodological principles of linguistic theory. By contrast, paraphrase nominalism and hermeneutic fictionalism make contentious empirical claims that conflict with the ordinary methodological standards of syntax-semantics and pragmatics (respectively). Or so I will argue.

Paraphrase nominalism, whether of Prior's (1971), Sellars's (1979), or any other type, treats superficially similar sentences as having radically different logical forms or "deep-structures". Thus, "Triangularity is a shape" is treated as very different from "Alf

is a boy" and similarly for apparently co-typical quantifications. Although unobvious syntactic-semantic analyses are sometimes motivated, they can be motivated only given overriding reasons (consisting of linguistic data and general considerations of theory-preference) against more obvious analyses. But no such data are appealed to by paraphrase nominalists. What drives these analyses is rather the desire to stay consistent with nominalism while making apparently committive sentences come out true. Note that while paraphrase nominalists take pains to produce paraphrases of sentences containing abstract terms, which do not contain those terms (and are thus "eliminative"), our explanatory correctness condition on meaning hypotheses entails no such constraint.

Note also that paraphrase nominalists cannot, for principled reasons, satisfy the explanatory demand. Recall that this constraint requires that use-facts about "property" are explained by appeal merely to the meaning-constitutive fact about "property" plus assumptions *not* about "property". But according to paraphrase nominalism, quantifications over properties (for instance) are supposed to have a special "property"-related interpretation. Thus, they cannot simply appeal to assumptions about the relevant quantifier plus the meaning claim about "property" to explain the use-facts about quantifications over properties. If, for instance, they take quantifiers to have a special lexical meaning when used alongside "property", then the auxiliary assumptions appealed to will, after all, partly be about "property", contrary to what is required by the explanatory constraint. This is a serious drawback of those theories, and good reason to accept claim (3).

Hermeneutic fictionalism holds that although apparently committive sentences indeed carry ontological commitments on their literal reading, speakers do not use or interpret them literally, but rather somehow fictionally (see Yablo (2001) and Kalderon (2005, Ch. 3) for some classifications of fictionalist theories, and Stanley (2001) for empirical and methodological objections). This theory is similarly undermotivated. Pragmatics (in the relevant sense) is the science of non-literal communication, the aim of which is to first gather data, consisting of intuitions about cases in which speaker's meaning fails to coincide with literal meaning (of the sentence uttered), and then state general principles to accommodate these data. Hermeneutic fictionalism simply *posits* that speakers use abstract sentences to communicate certain propositions not literally

expressed, but no data are appealed to. If we *do* consult our intuitions, we rather find evidence that abstract sentences are not at all used to engage in make-believe, as metaphors, or as merely true-in-a-fiction. Hermeneutic fictionalism can thus be dismissed on simple methodological and empirical grounds.

Am I not guilty of the very same violations of standard methodology when I propose a theory that makes speakers' utterances come out mostly untrue? To wit, isn't the (truth-maximising variant of the) Principle of Charity and the principle that "semantic theories must accommodate linguistic intuitions" simply violated by (DEP)? Firstly, note that it is claim (4) of (DEP) which makes the account conflict with these principles. This is a metaphysical claim, not one about language, and thus not one that should be assessed by any methodological constraints of linguistic theory. In my view, if error-theoretic views really are to be avoided, then we should abandon nominalism, rather than accept the kind of radical views of language criticised above. The (truth-maximising) Principle of Charity and its relationship with (DEP) require separate treatment (and is the topic of Båve (forthcoming)).

Here, I will be content to argue that as far as meaning hypotheses are concerned, the only constraint of "charity" we need to respect is one demanding that speakers come out as using expressions competently, and that we can explain why they accept the sentences they accept. This is the sense in which "semantic theories must accommodate linguistic intuitions".

Is it not bad enough that claim (4) contradicts linguistic intuitions? No, for the demand should not be that one's overall theory *entail* our linguistic intuitions, but rather that it *account* for them, either by entailing them or explaining why we have them (cf. Lewis (1983, 351ff.)). The "overall account" defended here includes (DEP), and it is claim (1) plus auxiliary assumptions that account for our intuitions regarding "property", namely, by explaining why competent speakers accept the sentences containing "property" they accept. The intuitions deemed false by the overall account are thus still accounted for, i.e., we explain why we have them.

We will also see in Section 5, that the paradox of abstraction shows that no account can entail all intuitions about "property", and that the linguistic part of (DEP) fares as well as one may hope for as concerns accommodating intuitions. (A similar, but much

more basic, point is made by Joseph Melia (1995, 223), who argues that it is not an arcane philosophical view that there are no abstract objects, but the view of ordinary speakers. On this view, giving a theory on which all ordinary speakers' views are true is simply impossible, so an error theory of some kind is unavoidable.)

2. The meaning of "property"

Given these preliminaries, I propose that claim (1) be cashed out as the following (M)-form claim:

(P) "Property" means *property* because it is necessary and sufficient for understanding "property" that one be disposed to accept the instances of:

(PA) $\mathbf{N}(F)$ is a property

(PR) $\mathbf{N}(F)$ is a property of $a \Leftrightarrow F(a)$.

In (PR), "is a property of" is meant to function as, e.g., "is a sister of", i.e., "property" is a *relational noun*. This assumption will be discussed at length below. Further, "$\mathbf{N}(F)$" in (PA) and (PR) stands proxy for a *nominalisation* of the one-place predicate "F". For example, the predicate, "(is) white" has the following nominalisations: "being white", "to be white", and "whiteness" (cf. Schnieder (2006b, 121)). Many one-place predicates, however, lack corresponding nominalisations, e.g., "John loves ξ". It seems that only proper verb phrases, which yield sentences only when *prefixed* by a singular term, have nominalisations. Also, for many well-formed predicate nominalisations N, the string, N^"is a property (of *a*)" sounds awkward, e.g., "running". The extent to which they sound awkward seems to depend on how "stably" the predicate tends to be true of objects. Thus, "having a sister" works fine in (PR), while "cooking food" does not, and "being angry" works only if we think of it as describing a character trait, rather than an occurrent state. I will not further investigate the details of these matters here, however, but simply assume there is a demarcation of the relevant class of predicates that is consistent with (DEP). (In general, I will not discuss the nature of predicate

nominalisations in this paper, except insofar as is necessary to account for sentences containing "property". I will thus ignore, e.g., uses of adjective nominalisations in, "The rose's redness", "There is much redness here" etc.)

Like the rule, "That p is true $\Leftrightarrow p$", central to truth-deflationism, (PR) is a *de-nominalisation* rule, in that the right-hand side contains a nominalisation missing in the left-hand side. By speaking of the inference rule (PR), rather than a biconditional schema, we avoid the consequence that one must understand "if and only if" in order to understand "property".

(P) entails that (PA) and (PR) are the defining principles of "property" (given our definition of "defining principle"). This may come as a surprise, since it is more common to assume that the relevant principle is

(PHR) a has the property (of) $\mathbf{N}(F) \Leftrightarrow F(a)$.[1]

However, I will argue that taking (PHR) as defining "property" has several drawbacks. Firstly, it invites the following worry: if someone already understands "have" (in whatever sense it has when used with "property"), it is not hard to see how they can come to understand "property" on the basis of (PHR). Conversely, if one already understands "property", we can see how one can come to understand "have" via (PHR). But if we are supposed to understand "property" on the basis of (PHR) plus an antecedent understanding of "have", what might the latter consist in? On the other hand, taking (PHR) to define both "have" and "property" at once seems problematically circular (cf. Schnieder (2004, 255f.)). (P) shows a way out of this circularity worry.

The main reasons for taking (PA)+(PR), rather than (PHR), as defining "property" are to the effect that the totality of acceptance facts about "property" are overall better explained by the former assumption. The evidence to this effect that I will adduce is not conclusive, but rather indicative, but this seems to me to lie in the nature of this type of query.

Another novelty is the principle (PA). It seems that this must be taken as a separate,

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[1] See, e.g., Schiffer (2003, 2.3), but see also Ramsey (1925, 404).

defining principle of "property", for the fact that we accept its instances does not seem explicable on the basis of (PR) (and auxiliary assumptions). In particular, a competent speaker will unconditionally accept, "Being a round square is a property", though many accept no sentence of the form, "*a* is a round square". I see no good way of explaining this (together with auxiliary assumptions) on the mere assumption that (PR) is a defining principle of "property". Admittedly, (PHR) is relevantly different from (PR) since it would suffice to accept a tautology, like, "If John is a round square, then John is a round square", to infer, by (PHR), "If John has the property of being a round square, then John is a round square", and then infer the relevant (PA)-instance. The last step would be a reasonable inference in that the conclusion seems to express what is presupposed by the premise.

However, it is very unlikely that speakers' acceptance of (PA) depends on their reasoning along such cumbersome and unnatural lines. This explanation also does not square with our unconditional and unreflective acceptance of (PA). Thirdly, this explanation assumes that speakers accept (PA) because they accept sentences containing phrases of the form "the property $\mathbf{N}(F)$", whereas, surely, the explanation should go the other way round. A speaker accepts as felicitous a phrase of the form "the N *a*" because she accepts the corresponding, "*a* is a(n) N", not *vice versa*. As I see it, therefore, the real choice of defining principles of "property" stands between (PA)+(PR) and (PA)+(PHR).[2]

There are other drawbacks of taking (PHR) as a defining principle of "property" having to do with the relationship between "the property (of) $\mathbf{N}(F)$" and "$\mathbf{N}(F)$ is a property". I agree with Benjamin Schnieder (2006a, 121ff.) that "the property (of) $\mathbf{N}(F)$" is a singular term (a "property designator"), which consists of the appositive phrase "the property (of)" and the predicate nominalisation, which, too, is a singular term. Property

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[2] How do we explain why we do not accept, "Napoleon is not a property"? I confess I am not sure about this, but note that this seems like a general problem, since it has turned out equally difficult to handle, in a non-*ad hoc* way, "Julius Caesar is not a number" (cf. Frege (1884, §55)) and "The Moon is not true" (cf. Horwich (2010, 42, note 10)). A solution to the latter problems will most likely provide one for the present one, but these solutions are yet to be found.

designators are thus syntactically and semantically like, "the country (of) Denmark". If (PHR) were the defining principle of "property", "property" would be very unlike other nouns, which are plausibly taken to have defining principles involving sentences of the form,

(a)　x is a N,

(b)　x is a N of y, or

(c)　x is the N of y.

It would be very odd to take the basic meaning-constitutive fact about "country", for instance, to be a fact about our acceptance of sentences containing appositions of the form "the country (of) x", rather than, "x is a country". For readability, I will henceforth abbreviate "the fact that competent speakers are disposed to accept (X)", as "Acc(X)". Now we can say that, since (PR) involves a sentence schema of form (b), it is more plausible to take Acc(PR) to be basic, at least if we can explain Acc(PHR) on the basis of Acc(PR). As we well see anon, we can.

A major benefit of (P) is that it allows for an independently plausible explanation why *"Socrates has being wise" is ill-formed. That this is ill-formed may be found surprising, since we accept sentences like, "Socrates has the property of being wise", "Being wise is a property Socrates has", etc. I propose this fact has the same explanation as the fact that although speakers may accept both

The circumference of circle A = 5 cm.

Circle A has the circumference 5 cm.

they do not accept,

*Circle A has 5 cm

Another case in point is, "France has a capital, namely, Paris" and *"France has Paris". In all three cases, the verb "have" has an interpretation when occurring alongside the nouns

"property", "circumference", or "capital", but not without them. Linguists have identified the reason for this anomaly: "have" sometimes takes what is known as its *relational sense* (see, e.g., Le Bruyn *et al.* (2013)). Roughly, when occurring in this sense, "have" takes on the meaning of the relational noun following it. Let us here define a relational noun as one that has at least one defining principle giving acceptance conditions for sentences of the form, "*x* is a/the N of *y*". So, "circumference", "capital" and other paradigmatically relational nouns (like, "sister") come out as relational nouns, as does "property" (given (P)). Although the details of the analysis remain controversial, it is uncontroversial that the following equivalences hold when "have" takes this sense:

(i) *x* has a(n) N $\Leftrightarrow$ Someone/something is a(n) N of *x*.

(ii) *x* has the N *y* $\Leftrightarrow$ *y* is the N of *x*.

Note that the right-hand sides here are sentences of form (b) or (c), which lack "have".

In *"Circle A has 5 cm" and *"France has Paris", there is no relational noun that can provide an interpretation for "have", explaining why these sentences are unacceptable. I propose that the unacceptability of *"Socrates has being wise" has the same explanation.

An important consequence of this relational interpretation of "have" is that it allows an obvious explanation of Acc(PHR) on the basis of

(1) Acc(PR),

(2) Acc("*a* has the property (of) $\mathbf{N}(F) \Leftrightarrow \mathbf{N}(F)$ is a property of *a*"),

where (2) holds, given the relational interpretation of "have" in (PHR)—see schema (ii).

Note that the relational analysis of "have" in (PHR) could not be appealed to in order to solve the circularity problem with supposing (PHR) to be a defining principle of "property". For this analysis would merely raise the question what "*x* is a property of *y*" means. (PR) would answer this question, but then (PR) is required as an additional defining principle after all. Since we can explain Acc(PHR) on the basis of (P) plus an independent assumption (about "have"), (P) is preferable to any account taking (PHR) as

a defining principle of "property".

If (PHR) is not the defining principle of "property", why is "have" used so often with "property" (perhaps more often than "is a property of")? Firstly, we should not expect frequency to co-vary with the wording of defining principles in the way this worry presupposes. I also think there is an explanation of the frequency of "have" in connection with "property". There is a general tendency to avoid multiple uses of the same word, at least for nouns (the tendency seems weaker for more syncategorematic words, like particles, "is", etc.). Further, many "property"-sentences we use have NPs containing "property" plus an instantiation predicate (such as "*x* has *y*" or "*y* is a property of *x*"). To avoid repetition of "property", we can use "have" instead of "is a property of". So instead of saying,

The most important property of a great general is a property of Napoleon,

we say,

Napoleon has the most important property of a great general,

and instead of,

Every property of a great general is a property of Napoleon,

we say,

Napoleon has every property of a great general.

We could not avoid repetition by omitting "a property" in "is a property of", since *"This property is of John" is ill-formed. Hence, I propose, the frequency of "have"-constructions.

Now, one may legitimately ask why the "circularity worry" concerning "have" does not also arise for the "of" in (PR). I am tempted to say that the meaning of "of" in all

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such occurrences is merely to serve the grammatical purpose of allowing an additional argument place. This is not unproblematic, but the point is not so much this analysis as the claim that "of" works the same way in "*x* is a property of *y*" as in "*x* is a sister of *y*", however exactly this functioning should be described (which I will not discuss here). The problem is thus general, and not one arising for (P) in particular. Whether "of" has an independent meaning in these phrases, or is somehow syncategorematic, we need not settle here: whatever the answer, we can simply add it to the present account of "property".

One could not make an analogous claim on behalf of the view that (PHR) is a defining principle of "property". That would consist in saying that the account of "have" in (PHR) will just draw on a more general account of the relationship between "have" and some given class of nouns. But the only candidate class here seems to be that of relational nouns. However, relational nouns do not typically have defining principles giving acceptance conditions of sentences of the form, "*x* has the N *y*" (where, "the N *y*" is appositional). No noun does.

Also, it seems the (admittedly inchoate) claim that "of" merely provides an additional argument place cannot be made with equal plausibility about "have" in (PHR), since "have" there would help form a two-place predicate only given a richer apparatus, involving appositional constructions.

It may seem problematic for my account that "of" in (PR) seems to have a kind of genitive meaning, thus expressing a "having"-relation, rather than merely "providing an extra argument place". Whatever objection one might try to make of this observation, I think it will fail, for "of" does not have a genitive meaning when used alongside "property", as in (PR). Evidence for this claim comes from other languages. For instance, Swedish has a noun functioning just like "property" (also in combination with "have") whose corresponding preposition, "hos", never takes a genitive meaning.

Here is a more serious problem: although "property" is indeed a relational noun by our definition (given (P)), it is still notably different from other relational nouns, in that the latter clearly satisfy the principle,

(NE)   If *x* is a(n) N, then *x* is a(n) N of something/someone,

whereas "property" does not (contrast, "Jane is a sister, but not a sister of anyone" with, "Being a round square is a property, but not a property of anything".) The explanation of this difference is that other relational nouns only have one defining principle, giving acceptance conditions of sentences of form (b). For such nouns N, "x is an N" must be understood somehow in terms of sentences of the form, "x is an N of y", simply because there is no other way it could receive an interpretation. For some reason, the way "x is an N" is interpreted in English, when N is purely relational, is as equivalent to "x is a N of something/someone".

However, since "property" is partly defined by (PA), it is not purely relational, but rather a kind of hybrid monadic/dyadic noun. Hence, the above reasoning about purely relational nouns could not be applied to "property". That is, since (PR) is not the only principle defining "property", we cannot say that sentences of the form, "x is a property" must be understood in terms of "x is a property of y". Since the other defining principle, (PA), concerns precisely sentences of the form, "x is a property", the latter can be given an interpretation without recourse to the (b)-form sentence, and this is enough for (PA) to cancel the default (NE)-rule.

If (PA) did not cancel the (NE)-rule, then sheer competence with the relevant expressions would dispose us to accept rather contentious sentences. For suppose (PA) did not cancel the (NE)-rule. Then "property" would satisfy (NE). Then, acceptance of an instance of (PA) would immediately prompt acceptance of the corresponding instance of "N(F) is a property of something". But, by (PR), this would prompt acceptance of the corresponding, "F(something)", which is contentious for many "F" (especially, "is a round square"). Thus, we have both an explanation of *how* (PA) would cancel the (NE)-rule and an account of the benefit thereby achieved. In Section 4, we will see also that the *raison d'être* of "property" is better served if (PA) were a defining principle of "property" than if it were not.

This talk of "property" as a "hybrid monadic/dyadic" noun will naturally sound unintelligible to those assuming that English sentences can be uniformly first-order formalisable, i.e., translatable into a first-order language. For if I am right, "property" cannot be rendered either as a one-place or as a two-place predicate. For typical relational

nouns, the formalisation will be a two-place predicate, and sentences of the form "x is a(n) N" will be translated as existentially quantified sentences. Thus, "Mary is a sister" will be formalised as, "∃y SISTER-OF(Mary, y)". But we have seen that this is not possible for "property", since on this analysis, "Being a round square is a property" would be more contentious than it is. In general, our analysis of "property" as a hybrid monadic/dyadic noun is motivated by uncontroversial data about the use of, or linguistic intuitions about, "property", and if these data point to a theory on which it is not first-order formalisable, that is good reason to shun any constraint that expressions must be so formalisable.

Recall that in Section 1, I promised to state a general, cross-linguistic condition on any language having a word meaning *property*. We can do this by quantifying over ordinary syntactic operations, i.e., definable functions taking *n* expressions into a well-formed complex expression. We need to quantify over such functions in order not to be too chauvinistic about which languages can contain a word meaning *property*. For instance, we do not want a language to be debarred form having a word meaning *property* only because it has a different word-order form English. In the same vein, we do not want to debar Arabic from having a word meaning *property* only because it has no (articulated) present-tense copula, or Finnish because it has no prepositions, or Russian because it has no indefinite article. But all of these languages have other devices serving the purpose of the expressions "is", "of", and "a" of English (and Germanic languages in general).

I will say that these languages all have the relevant syntactic functions. Quantifying over such functions will let us state suitably unchauvinistic conditions for a word's meaning *property*. To wit, the (M')-form claim about "property", promised in Section 1, reads:

(P'')   For all *e* and *L*, *e* means *property* in *L* iff *e* is a noun and *L* has:

        (i)   a copulative function *C*,

        (ii)   an indefinite-particle function *I*,

        (iii)   an adverbial-modification function *ADV*,

        (iv)   a prepositional-phrase function *P*, and

(v)   a predicate-nominalisation function **N**,

such that it is necessary and sufficient for understanding e that one be disposed, for any predicate F of L that one understands, and which satisfies condition X, and every singular term t that one understands, to accept

(PA'') $C(\mathbf{N}(F), I(e))$

(PR'') $ADV[C(\mathbf{N}(F), I(e)), P(t)] \Leftrightarrow F(t)$.

The "conditions X" are meant to spell out the kind of condition on predicates discussed above, of "stably" applying to objects. The syntactic functions quantified over here are rather simple things. For instance, in English, the relevant copulative function (or one of them, if there are several) takes an NP and an adjective to a sentence conjoining the two with the appropriate form of the copula verb "to be". To go on with obvious abbreviations, we can say, similarly, that I takes a noun N to an indefinite NP, "a"/"an"^N, *ADV* takes a sentence and an adverbial phrase to a sentence concatenating the two, and the relevant P (but there are clearly several prepositional-phrase functions) takes an NP to an adverbial phrase beginning with "of" (each preposition thus has a prepositional-phrase function of its own).

An advantage of quantifying over such functions is that we do not have to posit "zero-copulas", "zero-articles", etc., in order to allow languages like Arabic or Russian to have a word meaning *property*. We merely need to say that these languages need to have the kind of functions referred to above in order to have a word meaning *property*. And that they do is obvious. It is just that, for all NPs x and indefinite NPs y, the copulative function in Arabic takes x and y to $x^\wedge y$ (in the present tense), rather than some sentence containing an additional verb. Similarly, Russian has an indefinite-particle function, but it takes any noun to itself.

Also, (P'') clearly poses no constraint on word-order: copulative functions exist both in SVO-languages and in VSO-languages, and so on. Finally, by quantifying over prepositional-phrase functions, we allow languages having only case-inflections instead

of prepositions, like Finnish, to have a word meaning *property*. (P'') does, of course, require that any word meaning *property* be a noun, but this does not seem overly chauvinistic.

Let me end this section on a cautionary note. Recall my above admission that the arguments for (P) from the linguistic data are not absolutely conclusive. In particular, I think (PA) might not need not be taken as a defining principle of "property" after all. That would only be good news for the general spirit of (DEP). It would mean that we can give a simpler theory of "property", and we would then not be required to explain why (PA) helps "property" serve the purpose which is its *raison d'être* (more on which in Section 4). On such a theory, however, it must be shown how Acc(PA) can be explained on the basis of Acc(PR) plus auxiliary assumptions. It must also be explained how, contrary to first appearances, the Aristotelian principle "If *x* is a property, then it is a property of something" can be acceptable (indeed, on a par with, "If *x* is a sister, then *x* is a sister of someone"). Although I do not see how these consequences might be defended, I think there might be a way, so this simpler theory should not be definitely discounted.

3. Explaining Basic Linguistic Data

In this section, we will go through a number of central acceptance facts involving "property" to see if (P) can help explain them, thus satisfying the correctness condition described in Section 1. This proceeds by seeing whether there are facts not about "property", particularly the meaning-constitutive facts about other expressions, which, together with (P), explains the facts about which sentences containing "property" competent speakers accept and when.

The use-facts to be discussed can be grouped into the following categories:

(a) "property" in modal contexts,
(b) quantifications over properties,
(c) the demonstrative "those properties", and
(d) predications of properties.

Even these few examples will unfortunately have to be treated somewhat laconically and

with some uncertainty. But most of this uncertainty merely reflects our ignorance about the understanding conditions of various other expressions and so should not cast doubt on (P). A terminological note before we begin: I will be using "entail" and "equivalent", in a special, "use-theoretic" sense: I use "s_1 entails s_2" to abbreviate, "competent speakers are disposed to accept the inference from s_1 to s_2" and analogously for "equivalent".

The most important facts about how "property" interacts with modal expressions concern the conditionals,

(C1)   If the property (of) $\mathbf{N}(F)$ = the property (of) $\mathbf{N}(G)$, then, necessarily, all and only Fs are Gs.

(C2)   If, necessarily, all and only Fs are Gs, then the property (of) $\mathbf{N}(F)$ = the property (of) $\mathbf{N}(G)$,

of which (C1), but not (C2), is accepted (upon reflection) on the basis of sheer linguistic competence. Thus, the coarse-grained conception of properties, encapsulated in (C2), is not analytic (cf. Schnieder (2004, 225) and Lewis (1986, 55)).

Acc(C1) can be explained, I propose, by appeal to the fact that speakers who master predicate nominalisations are disposed to accept the rule,

(NS) $\mathbf{N}(F) = \mathbf{N}(G), S(\ldots F\ldots) \Rightarrow S(\ldots G\ldots)$,

where $S(\ldots\ \ldots)$ stands proxy for any modal (but not hyper-intensional) context. For instance, speakers readily accept, "If running is the same thing as walking quickly, then if joggers necessarily run, then joggers necessarily walk quickly". The only further fact needed for explaining Acc(C1) is that speakers are disposed to accept the (trivial) rule,

(AS)   the N $a = a$, $F(a) \Rightarrow F(\text{the N } a)$,

where "the N a" is an appositive, embedding the singular term "a". For (C1) follows, given (NS) and (AS) and conditional proof, from the analytic, "Necessarily, all and only

*F*s are *F*s". Since none of the relevant facts are facts about "property", the explanation accords with our correctness condition on meaning constitution claims of Section 1. Note also that Acc("The property of being a cordate ≠ the property of being a renate") is now also easily explained, by appeal to Acc(C1), Acc("Not necessarily, all renates are cordates"), and assuming speakers reason contrapositively.

Another fact is that we accept, "Necessarily, if snow is white, then being white is a property of snow". This fact I think requires that we assume that whenever a speaker competent with "necessarily" comes to accept a sentence "*p*" merely on the basis of understanding constitutive acceptance dispositions, she will be disposed to, "Necessarily, *p*". To explain other facts in the vicinity, other assumptions must be made about what constitutes the meaning of modal operators, but I must here be content with the above sample explanations of use-facts about "property" in modal contexts.

Let us now consider quantifications over properties, like the sentence

(QP)   Every property of *a* is a property of *b*

(we could also have discussed, "Every property *a* has, *b* has", which, given Acc(PHR), functions rather the same way). Now, a plausible defining principle of "every" is the rule,

(UR)   Every *F* is *G* ⟹ If *F*(*a*) then *G*(*a*)

A crucial fact about (QP) is that speakers are disposed to infer from it, instances of the schema, "If *F*(*a*), then *F*(*b*)" (though, as we have seen, only instances with predicates having well-formed nominalisations). The explanation of this fact is rather simple: by (UR), (QP) entails every well-formed instance of the schema "If **N**(*F*) is a property of *a*, then **N**(*F*) is a property of *b*". By (PR), every such instance is equivalent to "If *F*(*a*), then *F*(*b*)". Hence, (QP) works in an important respect like the predicational quantification, "∀*F*(If *F*(*a*), then *F*(*b*))" (but the latter entails *every* instance of "If *F*(*a*), then *F*(*b*)").

The above deals only with inferences *from* universal quantifications over properties, so we should also take a look at how speakers may come to accept them in the first place, e.g., by induction or reasoning from arbitrary instances. Beginning with

induction, let us suppose that a speaker has come to accept sufficiently many instances of the schema,

(1) For all *x*, *F*(*x*) since birth, and *F*(*x*) because of *x*'s genes,

and that the further conditions necessary for induction are met (e.g., one accepts no instance of "*F*(*a*) since birth, but not-(*F*(*a*) because of *a*'s genes)"). In accordance with (PR), the speaker might now infer, from each such instance, the corresponding instance of the schema,

(2) For all *x*, **N**(*F*) is a property of *x* since birth, and **N**(*F*) is a property of *x* because of *x*'s genes.

Next, via ordinary inductive reasoning, she may infer,

(3) For all properties *p* and all *x*, if *p* is a property of *x* since birth, then *p* is a property of *x* because of *x*'s genes.

Or, more colloquially, "An individual's inborn properties are all due to her genes". No other fact about "property" than (P) need be appealed to in order to explain how such reasoning goes.

What about inferences of universal quantifications over properties from "arbitrary instances"? Inferring from arbitrary instances seems to be a defining principle of universal quantifiers, but it is difficult to state exactly what it amounts to. Since this only means we do not know exactly how to state the understanding conditions of universal quantifiers, it is not in itself a problem for (P). However, there is a related worry about "property" I want to address. It seems that in order to infer a universal quantification over properties from an arbitrary instance, we need to begin with an arbitrary predicate "*H*", and then infer, by (PR), a sentence containing "**N**(*H*)", and then infer the quantification over properties, e.g., as follows:

(4)   If *H*(*a*), then *H*(*b*)   (where "*H*" is arbitrary)

(5)   If **N**(*H*) is a property of *a*, then **N**(*H*) is a property of *b*

(6)   For every *x*, if *x* is a property of *a*, then *x* is a property of *b*.

However, it may be thought that "**N**(*H*)" only *contains* an arbitrary expression, and is not itself arbitrary, since it is a nominalisation, and thus has a certain structure. I am not sure how to solve this problem, but note that something similar seems to be going on when we infer with arbitrary sentences:

(7)   If one knows that *p*, then one believes that *p*   (where "*p*" is arbitrary)

(8)   For every *x,* if one knows *x*, then one believes *x*.

The arbitrary term here must be "that *p*", but, like "**N**(*H*)", this is not wholly arbitrary, but only *contains* an arbitrary expression. Still, surely, we do reason from along the lines (8)-(9), so the problem does not seem to be specific to "property".

What now about the demonstrative, "those properties"? Suppose we say, "Mary is bold and quick-witted", and someone responds, "Indeed, Mary has those properties". Plainly, what is said here is equivalent, on this occasion, with, "Mary is bold and quick-witted". This is explained by taking "those" determine substituends, just like "she" determines "Mary" as a substituend if the latter is the most salient name. The substituends of "those" will, firstly, be predicate nominalisations, given the restriction imposed by "properties", and they will be determined by considerations of salience. The substituends will thus be nominalisations of the salient predicates, i.e., "is bold" and "is quick-witted". Then, "has" needs to be interpreted as relational and taking the meaning of "is a property of" (see Section 2), making the original sentence equivalent to, "Being bold and being quick-witted are properties of Mary". This, in turn, is equivalent to "Mary is bold and quick-witted, by (PR). Likewise, a purely deictic use, e.g., an utterance of "Tomatoes have *that* property" (pointing to a red surface), would be equivalent to "Tomatoes are red", because "red" becomes the most salient predicate thanks to the demonstration.

Being a noun, "property" can occur alongside various other expressions, forming complex expressions whose interpretation, as we will see, is not always obvious. Examples include, "inherit a property", "observable property", "property expressed by genes", all of which I shall call "predications of properties". Some of these predications are rather straightforwardly explicable on the basis of (P) plus some semantic principle connecting the predication either with the left-hand side of (PR), i.e., "$\mathbf{N}(F)$ is a property of x". For instance, the acceptance facts about the sentence,

(QPI)   *a inherited all his properties from b*

seems explicable by this method, since "inherit" is semantically connected to "have". The connection I have in mind is an analytic equivalence between,

x inherits y from z

and some sentence containing "have", say (but this is only a rough sketch),

x has y because z had y

(that they are analytically equivalent here means that speakers competent with all the expressions in these sentences will be disposed to infer between them). So the fact that, e.g., "If a is thin, then a is thin because b was thin" is entailed by (QPI) will be explained by this analytic equivalence together with further facts (in particular, Acc(PHR), which has already been explained on the basis of (P)). It is plausible that uses of possessive pronouns and the possessive "s", together with "property" can also be explained by virtue of a connection to either "of" or "have".

I predict that every predication of properties can be treated by exploiting some connection between the relevant expressions in the predication and the right-hand side of (PR) (often *via* relational "have"). However, this method often requires the positing of *temporary interpretations of the predication, arrived at by pragmatic processes*.

Of course, we must beware of appealing to pragmatic processes *ad hoc*, so that whenever we cannot explain the data by appeal to (P) and facts not about "property", we postulate pragmatically inferred interpretations. But we will see that in the cases I will consider, it is independently plausible that the natural interpretation is not compositionally determined from the usual literal meanings of the relevant expressions, in which case appealing to pragmatics is not *ad hoc* after all.

Consider, "observable property". I think it independently plausible that we cannot merely appeal to the literal meanings of "observable" and "property" to account for the natural interpretation of "observable property". For "is observable" normally means "can be observed", but "observable property" is not used to mean "property that can be observed". Rather, it is used to mean (roughly),

property such that one can observe whether something has it.

The grounds for thinking so is simply that it is intuitive and accords with the way we use "observable property" in philosophy and elsewhere. Given this interpretation, we can simply appeal to Acc(PHR) in order to explain the acceptance facts relating to "observable property". In particular, we can explain why speakers will accept instances of "$\mathbf{N}(F)$ is an observable property" when and only when they accept the corresponding, "One can observe whether F(something)".

A cautionary note: sometimes an interpretation of a predication of properties may no longer be "temporary", because the phrase has been used so often that the pragmatically inferred interpretation has become automated, so that an idiomatic new lexeme has emerged (cf. dead metaphors). In this case, there will actually be a use of "property" which we cannot explain merely by appeal to (P) and facts not about "property" (since the lexeme involving the predication is about "property"). But since these uses are idiomatic, I do not think this constitutes a serious counter-example.

Let us consider another example, the predication, "property expressed by genes". Again, it seems some pragmatic processing is required to make sense of this. A natural hypothesis is that speakers come to treat it as equivalent with, "property such that, for all *x*, if it is a property of *x*, it is a property of *x* because of *x*'s genes". Now, again, we can

simply appeal to (P) in order to explain the use-facts about this predication. For instance, we can explain the equivalence between any instance of "**N**(*F*) is a property expressed by genes" and the corresponding, "If *F*(something), then *F*(it) because of its genes". The last, "because of its genes" may of course be understood rather differently by different speakers, but the important point is that (P), together with an independently plausible hypothesis explains the acceptance equivalence between the predication and a sentence lacking the property designator.

Of course, not all predications of properties need be understood as resulting from pragmatic processes. They might as well be understood in accordance with some stipulative definition or by way of ostension and extrapolation. Perhaps the philosophical phrase, "natural property" is, at least in some philosophers' parlance, understood in accordance with the stipulation that something is a natural property just in case all things that *have* it are intrinsically/objectively/etc. similar. But of course an account of the ordinary meaning of "property" cannot be required to explain uses of the word when used in some stipulatively defined sense. What is important is whethr the relevant facts can be explained on the basis of whatever new predication of properties we encounter, whether stipulatively defined or arrived at via pragmatic processes.

Recall from Section 1 above that a claim as to what constitutes the fact that a given expression means so and so is true only true only if all the facts about the use of the expressions (acceptance facts) can be explained by the meaning constitution claim plus auxiliary hypotheses that no not concern the expression. The investigation of the samples above is intended to make it plausible that this constraint is met by (P). The more examples we can treat successfully on these lines, the more corroborated our hypothesis, of course, but I fear that going on further than I already have is more likely to bore the reader than to entrench her conviction. This seems to be a good point at which to stop and await possible counter-examples or other objections, and so I suggest any further development of thee ideas will be more of a collaborative pursuit.

4. The *raison d'être* of "property"

In this section, we turn to claim (2) of (DEP), i.e., that the *raison d'être* of "property" is

that it increases the expressive power of languages in which it is introduced. Let us first define the two central notions in claim (2), expressive strengthening and "*raison d'être*":

(RÊ) A fact f is the *raison d'être* of expression e iff$_{df}$ f is a fact about e to the effect that e serves a purpose relative to speakers' aims, which explains why e was introduced into and retained in the language.

(EP) An expression e increases the expressive power of a language L iff$_{df}$ there are sentences of L, such that some sentence of $L+e$ entails all and only them, but no sentence of L does (cf. Båve (2009)).

Definition (RÊ) resembles the "naturalised" conceptions of function much discussed in the philosophy of biology. Given this definition, we can see that while claim (1) of (DEP) promises to help explain the various use-facts of "property", claim (2) similarly promises to help explain the fact that "property" is used at all. We are of course very far from filling out the latter explanation in any informative way, but this, again, merely reflects a general ignorance. It is a scientific mystery how the benefits of expressions partake in the explanation of their introduction and retention. But this is no less of a problem for other expressions (quantifiers, connectives). In any case, it seems plausible that every expression has been introduced and retained because of some benefit it affords.

Let us now see how "property" comes out as increasing the expressive power of English, given (EP). Firstly, it is important that "entail" in (EP) is used in the "use-theoretic" sense explained above. Now, let English-prop be English minus "property" (and minus all its synonyms, like "attribute", etc.). Now, the sentence (QP) above can be seen to entail every instance in English-prop of the schema, "If $F(a)$, then $F(b)$" whose instantiating predicate can felicitously instantiate (PR) and (PA). However, it entails no (or few) other sentences.

Now, "property" satisfies the *definiens* of (EP) if no sentence of English-prop is inferentially like this. And this seems indeed to be the case. For instance, although "Everything is true" entails everything that (QP) entails, it also entails also every other sentence. Similarly, "copular quantification", exemplified by, "*b* is everything that *a* is"

is inferentially different from (QP), in that the former only entails the instances of, "If *a* is X, then *b* is X", by which I mean the results of replacing "X" by any expression that can follow the copula "is" (such as indefinite noun-phrases and adjectives).

I submit that (QP) is an example of how "property" increases the expressive power of English. Note, however, that (QP) is also different from "$\forall F$(If $F(a)$ then $F(b)$)", featuring predicational quantification, in that the latter entails every instance of "If $F(a)$ then $F(b)$" whatsoever. So on (EP), perhaps oddly, "property" would increase the expressive power a language containing predicational quantifiers, but I will let this quirk of the definition remain, since the general point should be clear enough.

I think it is crucial that the expressive strengthening afforded by "property" was achieved in a *grammatically conservative way*, i.e., without requiring the introduction of new grammatical rules or categories.[3] The introduction of "property" as an ordinary *noun* ensured a cost-efficient solution to the problem of meeting two conflicting desiderata: increasing expressive power and minimising grammatical changes. This was possible because "property", as an ordinary noun, can be used in many different constructions together with other, pre-existing expressions, and thus various pre-existing semantic relationships between nouns and these other expressions could be exploited.

The above focus on quantifications over properties should not blind us to the full range of expressive benefits of "property", all due to its belonging to a familiar grammatical category. Think, for instance, of all the other NP-forming expressions that can be used with "property", e.g., demonstratives ("that property"), the (in)definite article ("the/a property"), restricting adjectives ("observable property", "the same property as"), adjectival numerals ("two properties"), and so on. Also, we can ascribe properties to properties, and properties of indefinitely increasing numbers of order. (Note that this claim would be unavailable for paraphrase nominalists, who deny claim (3) of (DEP). Clearly, they cannot agree that "pre-existing semantic relationships are exploited", since they claim that the constructions containing "property" need to be interpreted differently

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[3] For similar points about "true", see Grover *et al*. (1975, 99f.), Forbes (1986, 36), Horwich (1998a, 32), and Båve (2006, 31).

from superficially similar ones.[4])

Predicational quantifiers and variables of course belong to grammatical categories not found in English. But this claim understates the difference between them and "property". For consider all the sentences that can be formed with "property" and the various NP-forming expressions above. In order to formulate inferentially equivalent sentences using predicational quantifiers and/or variables, we would need *yet* further expressions of new grammatical categories, and rather unnatural ones at that. For instance, it clearly requires some new kind of locution to formulate something functioning like the demonstrative "that property" using predicational variables. Thus, the net-gain of introducing "property" is greater than might be gathered by merely focussing on quantifications over properties. We can now also see that copular quantification falls far short of the expressive strengthening afforded by "property".[5]

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[4] There is a striking historical parallel between, on the one hand, the present account of "property" and Horwich's account of "true", and, on the other hand, paraphrase nominalism and the semantic hypotheses of early truth-deflationists. Early truth-deflationists, like Frank Ramsey (1927) and C. J. F. Williams (1976), tried to paraphrase away the truth-predicate in ways very similar to the way paraphrase nominalists tried to paraphrase away "proposition" (see esp. Arthur Prior (1971)). Quantifications like "Everything he says is true" were analysed as having the logical form, "$\forall p$(If he said that p, then p)". A paraphrase nominalist about properties would similarly hold that the logical form of, "Every property of a is a property of b" is "$\forall F$(If $F(a)$ then $F(b)$)". Dismissing the demand of paraphrase, or eliminative definition, Horwich was able to explain the meaning contribution of "true" in all occurrences without any exotic hypotheses about logical form (1998a), while explaining the connection to propositional quantifiers by appealing instead to the *function* of "true". The present account of "property" closely follows this strategy.

[5] Just as it is misleading to say that "property" just enables predicational quantification, the analogous, and rather common, claim about "true" and quantification into sentence-position is equally misleading. Not only can we do much more with "true", it is just plain wrong to say that "true" enables quantification into sentence-position at all. If anything, it

I think the way in which "property" increases the expressive power of language is really an instance of a more general phenomenon. Let us say that an expression *e* allows *expressive syntactic variants* just in case *e* is introduced into the language in order to increase its expressive power, by a defining principle of the form "$p \Leftrightarrow V(p, e)$". Here, "*p*" may be restricted to instances of a certain structure, and "*V*" signifies a specific transformational procedure for yielding a sentence containing both *e* and the elements of "*p*". If (P) and claim (2) are true, (PR) is an example of such a defining principle. Another expression that plausibly allows expressive syntactic variants is "true", introduced by the defining principle,

(TR)   That *p* is true $\Leftrightarrow$ *p*.

 More surprisingly, the "by" of passive voice can be seen as another example, defined by,

(PassR)   *a* φ:s *b* $\Leftrightarrow$ *b* is φ:ed by *a*.

Dummett (1973, 12) noted that while we can say that ($\forall x$)($\exists y$)(*x* envies *y*) in natural language, by "Everyone envies someone", the content of "($\exists y$)($\forall x$)(*x* envies *y*)" requires a locution like passive voice, with which we can say, "Someone is envied by everyone" (he also notes that a relative clause would do essentially the same job). Because the order of quantifiers in English determines both scope and agent-patient role, we need a way to switch scopes without switching the agent-patient roles. Of course, we might as well have said, "Someone is such that everyone envies them". But this is arguably another example

is quantifications over propositions, like "Everything he believes…", etc., that enables quantification into sentence-position. Thus, "You believe everything he says" is inferentially like, "$\forall p$(If he says that *p*, then you believe that *p*)". What "true" does, rather, is to allow sentences that, together with quantification over propositions, amount to quantification into *freestanding* sentence positions. For instance, "Everything the Pope says is true" is inferentially like "($\forall p$)(If he believes that *p*, then *p*)", whose consequent is freestanding.

of the same phenomenon, since "such that" can be taken to be defined by,

(SR) $S(a) \Leftrightarrow a$ is such that S(it).

A similar suggestion could be made about "way" and verb-modifying adverbs:

(WR) $x \; \varphi$:s A-ly $\Leftrightarrow x \; \varphi$:s in a(n) A way.

More controversially, set-theoretic and numeric expressions can be seen as further examples, introduced, respectively, by the de-nominalisation rules,

(SetR) $F(a) \Leftrightarrow a \in \{x: F(x)\}$

and

(NR)   There are n_A Fs $\Leftrightarrow$ the number of Fs $= n_N$

(where "$_A$" and "$_N$" respectively indicate adjectival and nominal positions).

If at least some of these candidates of expressive syntactic variants are the real thing, then claim (2) can be seen as just an example of a more general phenomenon, which is generally attractive.

Above, I have only argued that increasing the expressive power of languages is *a* function of "property", whereas claim (2) is the claim that it is its only function. But I think the normal use of "property" among ordinary speakers indicates that it is not in fact used for any other purpose. In particular, it does not seem that "property", like concrete count nouns, is ever used to "discuss specific properties as topics in their own right". This is a vague phrase, but let me offer a precisification: concrete count nouns, in quantifications or other constructions, are not typically used for the purpose of ultimately arriving at sentences *lacking* the noun in question, whereas, as we have seen, "property" is. This was clear in the case of quantifications over properties. By contrast, "All cats were fed" serves the purpose of allowing inference to "That cat was fed", "Mimi was

fed", etc., but these instances are not in turn typically used to infer any particular category of sentences lacking reference to cats. Likewise, we have seen in Section 3 that predications of properties serve the purpose of "abbreviating" cumbersome sentences lacking "property" (e.g., "**N**(*F*) is observable" abbreviates, "One can observe whether *F*(something)", which lacks "property"). Again, this is not so for concrete nouns: there are no particular non-cat-referring sentences we typically infer from predications of cats, and similarly for other concrete nouns.

We have seen that claim (3) plays an important role in the account of the *raison d'être* of "property" above. There is also a connection between claim (2) and claim (4), indeed, an argument from (2) to (4). Suppose there are properties. Then, surely, the *raison d'être* of "property" is to allow reference to properties, just as the *raison d'être* of "cat" is to allow reference to cats. In that case, the *raison d'être* of "property" cannot be to increase the expressive power of languages, as per claim (2). So if (2) is true, so is (4). Since (2) is plausible in itself (and should be even to realists), we have an argument from (2) to (4), revealing a strong internal coherence in (DEP).

The weak spots in this argument is, firstly, the assumption that if there are properties, the *raison d'être* of "property" must be to allow reference to them, and, secondly, the assumption that an expression cannot have two distinct types of *raison d'être*. Against the first, it may be objected that the general principle, "If there are Ns, then the function of "N" is to allow referent to Ns" does not hold, since it does not hold for fictional nouns, like "unicorn" (thanks to Gonzalo Rodriguez-Pereyra for pointing this out to me). On the other hand, maybe Kripke (1972, 344f.) was right that it is simply impossible for unicorns to exist, in which case this counter-example fails. More importantly, we do not need this general claim, but merely the claim about properties. The second premise is not self-evident either. While I find both assumptions plausible, I must leave any further support of them to another occasion.

In Section 1, I said that "property" had better only have such defining principles as are needed for it to serve the purpose which is its *raison d'être*, according to claim (2). The principle (PR) clearly contributes to this purpose, but it is less clear how things stand with (PA). I will now argue, however, that without this principle, many derivations involving sentences containing "property" would have been very cumbersome.

Derivations involving (QP) are not a case in point, since (QP) features the full phrase "*x* is a property of *y*", and so can be accounted for by (PR) alone. But consider,

(QP')   Every property is an observable property,

which does not feature this full phrase. The first step toward inferring "property"-free sentences from (QP') is to infer directly from (QP'), sentences of the form,

(QP'I)   **N**(*F*) is an observable property.

A sentence of this form can be inferred from (QP') given as an additional premise a corresponding instance of (PA). But recall that without (PA) as a defining principle, the (NE)-rule would apply to "property". So in order to accept an instance of (PA), we would first have to accept a sentence of the form, "**N**(*F*) is a property of something", and, for that, we must accept the corresponding, "*F*(something)". Only then could we come to infer the instance of (QP'I).

Not only is this a comparatively cumbersome derivation, we will also be able to accept only those instances of (QP'I) whose instantiating predicates we think apply to something. This is contrary to the purpose of enabling sentences having the instances of certain predicate-schemata as entailments, which is the kind of purpose "property" is meant to serve. With (PA) as a defining principle, by contrast, "property" is established as *de jure* hypernymous to predicate nominalisations, thus facilitating inferences from sentences containing "property" to sentences containing predicate nominalisations (and ultimately to "property"-free sentences). This, in any case, is how I think one should try to square (P) with claim (2) of (DEP).

5. The paradox of abstraction

This section introduces the second part of this paper, where I discuss the most important respects ways in which (DEP) displays an attractive internal coherence, as promised in the introduction. In this section, I will argue that (DEP) affords a principled and plausible solution to the "paradox of abstraction", consisting in the incompatibility of the following

apparently true claims:

(1)   The sentences (i) "Snow is white" and (ii) "Being white is a property of snow" entail each other.

(2)   (i) does not entail that there is a property, but (ii) does.

Analogous paradoxes relate to the pair

(i')   There are two apples
(ii')   The number of apples = 2

involving numerals, and the similar pair involving "set".[6] Importantly, "entail" in (1) and (2) should not be understood in the use-theoretic sense, but rather in terms of truth-preservation. Then, (DEP) commits us to rejecting (1) while granting (2).

But (DEP) also offers an explanation to why (1) seems true, which is that accepting inferences between (i) and (ii) is necessary for understanding "property" (by (P)). We thus have what Stephen Schiffer (2003, 196ff.) calls a "happy-face" solution to this paradox, i.e., a principled way of choosing among the inconsistent claims and an explanation of the appeal of the principle rejected. It may be objected that this can

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[6] Stephen Schiffer (1987) and Thomas Hofweber (2005) argue that neither (i') nor (ii') entails commitment to abstract objects, and thus that they have the same truth-value (Schiffer subsequently adopted a more ecumenical stance on which the entities they commit us to are "pleonastic" and ontologically unproblematic (2003)). Crispin Wright and Bob Hale (2001), as well as Nathan Salmon (2008) argue that both (i') and (ii') entail commitment to abstract objects. Hartry Field (1984) agrees with the present account that they have different commitments, and thus claim that the inferences between them are invalid. Cian Dorr (2005) argues that the paradox is resolved once we notice an ambiguity in "there is", one on which it follows from (i) that there are properties, and one on which it does not.

scarcely be a "happy-face" solution if it commits us to saying that we have an expression in our language understanding which requires that we accept an invalid principle. But claim (2) offers an explanation of why this should be so: accepting this principle increases the expressive power of our language, and this does not require that the principle be valid.

Also, that defining principles can turn out false or invalid has been forcefully argued by Chihara (1979), who devises some simple and clear examples of stipulative definitions that are either inherently inconsistent or inconsistent with some empirical fact, which must therefore be false, yet also plausibly analytic (if anything is) (cf. also Tappenden (1993), Boghossian (1997), and Eklund (2002)).

In Section 1, I said that there is an argument that the linguistic part of (DEP) (claims (1)-(3)) fares at least as well with accommodating intuitions as its rivals. It runs as follows: we note first that no consistent semantic theory *can* meet the requirement of entailing all intuitions, since (1) and (2) are both intuitive, but jointly inconsistent. The best any semanticist can hope for, then, is to grant the truth of one and accommodate the other by explaining why we intuit that it is true. Claims (1)-(3) do this, and the only claim of (DEP) contradicting any intuitions is the non-linguistic claim (4).

6. Correctness

Any error-theoretic nominalism must explain the difference between *correct* and *incorrect* abstract sentences. The intended meanings of "correct" and "incorrect", respectively, may be given ostensively by, "1+1=2" and "1+1=3". The problem is that the difference cannot be said to consist in that between truth and untruth. Still, it seems to have something to do with truth: intuitively, a correct sentence is one that is "true aside from the commitment to properties". (Of course, (DEP) does not deem all correct sentences containing "property" untrue, as witnessed by "There are no properties that one can both have and not have".) Stating adequate correctness conditions, in any case, is a non-trivial task for many non-realist theories (see Rayo (2007, 3.3) for an overview).

For many important sentences, it is quite clear whether they should be considered correct or not: "There is a property common to both Plato and Aristotle" is correct, whereas "There is a property that Aristotle both has and doesn't have" is not; "All

properties one knows one has, one believes one has" is correct, but "All properties of Aristotle are properties of Plato" is not.

The standard condition of correctness for sentences entailing the existence of some entity takes a sentence to be correct just in case it would have been true if entities of the relevant type were to exist (Balaguer (2009)). But, firstly, this definition commits us to accepting either that abstract objects could exist or that there are non-vacuously true counterpossibles, both of which are controversial. More importantly, this definition does not inform us about the generalisations that underlie the counterfactual. If we could state these generalisations concerning "property", however, we could define correctness in terms of them (or so I will argue) and the counterfactual definition would be idle (as well as having the aforementioned problematic commitments). The definition I will propose reads,

(CCP)   A sentence *S* containing "property" is correct just in case (i) *S* can be inferred from true, nominalistic sentences using valid inference rules plus (PA)+(PR) and (ii) every nominalistic sentence which can be inferred by valid inferences plus (PA)+(PR) is true.

A nominalistic sentence is here a sentence whose truth does not entail that there are properties. The generalisations I claimed are lacking in the counterfactual definition of correctness are here simply (PR)+(PA). Three important advantages of (CCP) are:

(1)   (CCP) determines sentences containing "property" as correct or incorrect as desirably as does the counterfactual condition.
(2)   (CCP) explains more than the counterfactual condition.
(3)   (CCP) avoids the unwanted commitments of the counterfactual condition.

To make (1) plausible, let us consider some particular cases. Note first that, e.g., "Aristotle is a philosopher" and "Plato is a philosopher" are true, nominalistic sentences. It follows that, "There is a property common to Aristotle and Plato" is correct (though untrue), since it can be inferred from them using (PA)+(PR) and existential

generalisation, and it cannot be used to derive any false nominalistic sentence. Further, "There is a property that Aristotle both has and doesn't have" is incorrect, since it is a logical falsehood, and thus entails false, nominalistic sentences. Furthermore, "All properties Aristotle has, Plato has" is incorrect, since we can infer the false, nominalistic, "If Aristotle was Alexander's teacher, then Plato was Alexander's teacher". This example shows why (i) would not be a sufficient correctness condition: the sentence is derivable from the true claim that there are no properties (it is vacuously true on this assumption, at least on standard accounts of universal quantification).[7]

A kind of symmetry can now be descried: universal quantifications over properties trivially satisfy condition (i), whence their correctness only depends non-trivially on whether it satisfies (ii). By contrast, existential quantifications over properties, like "There is a property that both Aristotle and Plato has", satisfy (ii) trivially (except in the case of logical falsehoods), but satisfy (i), or fail to do so, only non-trivially. The imperfection of the asymmetry stems from the fact that there are logical falsehoods of the form, "Some F is G", but none of the form, "Every F is G" (in Aristotelian logic, however, this is not so, so assuming such a system, we could grant perfect symmetry).

Clearly, (CCP) does not by itself allow us to determine whether a sentence is correct or not, and some sentences require for such determination that certain controversial matters be settled. We would need to know more about how defining principles like (PR) relate to propositional attitude contexts, for instance, to determine whether "If John believes that snow is white, then John believes that snow has the property of being white" is correct. But since we have no strong intuitions about the correctness of these sentences anyway, and since the counterfactual condition scarcely fares any better in this respect, I think we can safely let this matter rest.

A "nominalistic sentence" was characterised as one that carries no commitment to properties. However, this means that "There are numbers" counts as a nominalistic sentence. This is fine as far as (DEP) is concerned, for it does not say anything about the existence of other kinds of abstracta. Still, it is quite natural for an adherent of (DEP) to be a nominalistic error theorist across the board. An obvious weakness of (CCP) as

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[7] Thanks to an anonymous referee at *dialectica* for this observation.

compared with the counterfactual condition is that the latter can very easily be expanded to cover all *abstracta,* whereas it may seem unclear how to generalise (CCP) in such a way. Still, I would like to propose the following generalisation:

(CCA) A sentence S containing abstract terms t_1, …, t_n, is correct just in case (i') S can be inferred from true sentences using the defining principles of t_1, …, t_n, and (ii) only true sentences can be inferred from S using the defining principles of for t_1, …, t_n,.

Here, I have omitted "nominalistic", which would be superfluous, since we are reasoning under the supposition that all sentences apparently carrying commitment to any abstract entity are untrue. In order for (CCA) to give the right verdicts about any committive sentence, the "abstract terms" must include not only nouns like "property" and "number", but singular terms like "1" and "whiteness", and also predicates and functors defined primarily for abstracta, such as "prime" and "+". (This should be obvious, since, e.g., "Something is prime" and "For some x, y, z, $x = y + z$" are inconsistent with across-the-board nominalism.) Of course, (CCA) could be fully vindicated only given a treatment that falls outside the scope of this paper. At least, I hope to have shown that it fares rather well by comparison with the standard correctness condition proposed by nominalists.

7. Does the usefulness of "property" count against (DEP)?

Many would answer the question above in the affirmative, but, as we will see, such an answer may be specified in various ways, and may thus be motivated rather differently. I will here investigate four different arguments from the usefulness of "property" to the falsity of (DEP).

One objection extrapolates from the observation that if a theory positing a given type of entity—say, a type of elementary particle—turns out to be virtuous, then the best explanation of this fact includes the assumption that the particle exists (see Devitt (2007) for an overview of this kind of argument). So, one might think, since quantifying over properties may make theories more virtuous, we can similarly infer that properties exist. But the two cases are different in at least two respects: the former kind of explanation will appeal to causal powers of the particle, whereas abstract entities are causally inert.

Secondly, the argument plays fast and loose with "virtuous": empirical adequacy and expressive power are very different virtues. In Section 4, we gave a plausible and detailed explanation of how "property" lends theories the latter kind of virtue, and this explanation is consistent with the claim that there are no properties.[8] Thus, it is not in general true that if quantifying over a certain kind of entity lends a theory a virtue, then the explanation of this fact requires that there be entities of this kind.

A second kind of argument is that if (DEP) were true, then "property" would be useless, or even detrimental, due to the massive error it engenders. In support for this claim, one can simply consider the general detrimental effects of accepting false sentences. The upshot is that "property" could be useful only if it does not entail massive error.

In reply, let me first grant that there is a close connection between truth and usefulness, namely, in that a word is useful if, and *only* if, it promotes the general aim of accepting true *nominalistic* sentences. The question is now whether "property" can be shown to promote this aim even if its defining principles are invalid. Of course, it can only promote this aim to the extent that speakers accept *correct* sentences containing "property". This assumption should be granted, for at least two reasons. Firstly, if property talk could be shown "detrimental" only in that speakers mostly accept incorrect sentences, then it is not "property" that is to blame, but some general defect of speakers. Secondly, an analogous assumption will be true of other expressions. For instance, using "or" promotes the aim of accepting true "or"-free sentences only to the extent that the sentences one accepts are entailed by, and entail, true "or"-free sentences (and similarly for other logical constants).

So, in order to explain how "property" promotes the aim in question, we may legitimately focus on our acceptance of correct sentences containing "property". But it will now be clear that there are plenty of correct sentences from which we could infer (and so come to accept) sentences we would not have had any means of coming to accept

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[8] For a more recent debate about the differences between theoretical entities and abstracta as regards indispensability arguments, see Melia (2000, 2002), Colyvan (2002), Liggins (2012), and Yablo (2012).

without "property". For instance, universal quantifications over properties can be arrived at by induction, which allows us to infer sentences that were not in the induction base. Or, we may come to accept a quantification over properties by *a priori* means, which can be "stored" and used in inferences subsequently, whereas without "property", no such "storing" could have taken place. Since the quantifications are by hypothesis correct, their nominalistic entailments are true.

Further, we have already seen that the purpose and typical use of "property" consists in formulating sentences from which to infer certain nominalistic sentences (more specifically, instances of certain predicate schemata). We can also *share* such beneficial inferential dispositions by uttering these sentences in the presence of other speakers. Thus, there is an important sense in which "property", thanks to its increasing expressive power, also promotes the aim of arriving at new truths.

I take this to be a satisfactory reply to the objection. There is indeed some force in the objection's reference to the detrimental effects of accepting false sentences, but I think the only examples will concern the acceptance of false nominalistic sentences (and so, only indirectly, of incorrect abstract sentences). Quite generally, error theories like (DEP) clearly commit one to claiming that truth is not as generally useful as philosophers have assumed. Rather, the generally perceived usefulness of accepting true sentences will be seen as an over-generalisation from the usefulness of accepting true sentences about concrete matters.

Let us now consider the most famous kind of argument from the usefulness of a discourse to the existence of a type of entity: the indispensability argument originally championed by Quine (1948) and Putnam (1972). The argument structure, in a nutshell, is that quantification over and/or reference to a given type of entity is indispensable to our best theories, and that we should therefore quantify and/or refer to them, which means accepting they exist. My simple reply is that quantification over or reference to properties is not indispensable to our best theories, and that claim (2) of (DEP) explains why. The major assumptions of this reply are,

(a)   all theoretically useful occurrences of "property" serve the purpose of generalising over predicate-schema instances,

(b)   the sentences with those occurrences can therefore be replaced without relevant loss by predicational quantifications, and

(c)   predicational quantifications are ontologically innocent.

By "theoretically useful" uses of "property", I exclude redundant occurrences, as in "$\mathbf{N}(F)$ is a property of a", "The property (of) $\mathbf{N}(F)$ is observable", or "a has those properties", which, by (P) and the hypotheses of Section 3 can be replaced without loss by equivalent (in the use-theoretic sense) corresponding nominalistic sentences. Although claim (2) of (DEP) does not entail claim (a), the latter seems likely if (2) is true. A quick glance at the examples of allegedly useful quantifications over properties (Armstrong (1978, 1983), Lewis (1983), (1986, 1.5), Swoyer (2009)) further confirms this assumption. For instance, Armstrong's proposal as to the logical form of laws of nature (*ibid.*) is clearly to the effect of predicational quantification (with the additional claim that they must be taken as modal).

It may be objected that quantification over higher-order properties, e.g., properties of properties, is theoretically useful but not replaceable by predicational quantification. This is correct, if by "predicational quantification", we mean merely quantification into first-order predicate position. But, as used in (a), the notion of predicational quantification should be interpreted more broadly, to include quantification into the position of higher-order predicates (also called third-order quantification), more on which anon.

The qualification in (b) that quantifications over properties can be replaced "without relevant loss" by predicational quantification means that although the replacing sentences will not be synonymous with the replaced ones, they will have a similar inferential role (the difference between them actually reflects an advantage of predicational quantification over "property"). This inferential similarity, I submit, is enough for the substitution to be "without relevant loss". Of course, predicational quantification also is not grammatically conservative, but this does not make it less suitable for theoretical purposes. This fact was relevant only for explaining why property talk, rather than predicational quantification, has emerged in English.

We have seen how claim (a) is supported by examples of useful uses of "property"

and independently motivated by (DEP), and that (b) can be inferred from (a). So what about (c)? I side with Rayo and Yablo that quantifying into a given syntactic position is no more ontologically contentious than using instances of that syntactic category (hence, predicational quantification is in general as innocent as predicates). The debates about (c) have mostly proceeded on the assumption that in order to be intelligible, predicational quantifiers must either be given a standard truth-theoretic semantics or a general method of paraphrase into natural English.[9] The reasons both for and against thinking predicational quantification commits one to abstract entities are thus mostly based on assumptions that are naturally rejected by adherents of (DEP).

The obvious alternative view, which is also the natural view of anyone accepting (DEP), is that the meanings of predicational quantifiers are "given by" inference rules and/or axiom schemata (see, e.g., Prawitz (1965) or Shapiro (2001: 2.2) for higher-order deductive systems and Wright (2007, §2) for an endorsement of an inferentialist account of higher-order quantification). This rough idea can be rather easily reformulated in accordance with the above format involving understanding conditions (cf. Båve (2013)). On such a view, there seems to be little reason to take predicational quantification as ontologically more contentious than simply using predicates.

What, now, of quantification over higher-order properties? I explained above how the grammatical conservativeness of the introduction of "property" meant that the expressive strengthening it affords is greater than what would be suggested by focussing exclusively on simple quantification over properties, and I gave a number of examples. A particularly important example involves talk of higher-order properties. This talk cannot simply be replaced by ordinary predicational quantifications. But I have already conceded that predicational quantification is not enough to mimic the full expressive affordances of "property". A simple and obvious example was the demonstrative, "that property". In

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[9] See Quine (1969), (1970) for classical statements of the view that such quantifiers ontologically commit one to *abstracta*, and Boolos (1975) and Williamson (2003) for classical replies. See also, e.g., Stephan Krämer (2014, §2) for a brief overview of the debate.

contrast to this demonstrative use, however, talk of higher-order properties is theoretically important, and thus deserves special attention.

I said that if we were to achieve the full expressive power of "property" by way of predicational quantifiers, we would also have to invest in several further expressive devices (e.g., some kind of demonstrative, which is syntactically like a predicate rather than a singular term). In order to achieve the expressive power of talk of higher-order properties, we need to invest in quantifiers whose variables occupy the position of higher-order predicates.

A (one-place) second-order predicate is had by taking out one first-order predicate out of any sentence. Thus, "$\forall x(F(x) \rightarrow G(x))$" contains the second-order predicate, "$\forall x(\Xi(x) \rightarrow G(x))$", where "$\Xi$" marks a slot for first-order predicates just like "ξ" in "$F(\xi)$" marks a slot for singular terms. Whereas the expressions in this example of a second-order predicate are all found in ordinary predicate logic, *primitive* (constant or variable) second-order predicates are not. And second-order predicational quantification requires precisely second-order predicate *variables*. We could also, e.g., for the sake of brevity, introduce primitive second-order predicate *constants*, like "Observable(Ξ)", defined by

(DO) $\forall F$(Observable(F) iff$_{\text{def}}$ $\exists x$(One can observe whether $F(x)$)).

Suppose that we have similarly defined the constant, "Physical(Ξ)". Now, we can replace a sentence like,

All properties of observable properties are properties of physical properties

by,

$\forall \mathcal{R} \forall F$(Observable($F$) & $\mathcal{R}(F) \rightarrow \forall G$(Physical($G$) $\rightarrow \mathcal{R}(G)$)),

and so on, I submit, for any quantification over properties of any order. As with first-

order predicational quantifiers (i.e., quantifiers binding into the position of first-order predicates), higher-order predicational quantifiers should be seen as defined by inference rules. Such rules are obvious extensions of the rules for first-order predicational quantification (cf. Shapiro (2001, 39)).

Thus, there is a fairly obvious way in which to defend claim (a) in view of the theoretical significance of talk of higher-order properties. I conclude that (a)-(c), which are sufficient for rebutting an indispensability argument for properties are well-motivated, both by (DEP) and independently, and thus that we hereby have a further example of how (DEP) exhibits an attractive internal coherence.

There is a worry about replacing ontologically committing elements of theories by nominalistic counterparts that I would like to briefly address here. The worry is that it is not necessarily possible to separate the part of a theory carrying ontological commitment to abstracta from the rest. For instance, it may be that mathematics so pervades physics that one cannot separate parts of physics whose virtues must be explained by using those parts themselves from parts whose virtues need not be so explained (see, e.g., Maddy (1997) and Colyvan (2001)). This worry mainly concerns Hartry Field's (1980) attempts at replacing various scientific theories by nominalistic counterparts, but although there are a few superficial resemblances between strategy and my proposal, they are in fact quite different and, I will argue, the latter is unaffected by this worry.

The similarities between Field's view and those defended above are obvious: on both, the usefulness of abstract vocabulary consists in its enabling inferential bridges between nominalistic sentences. However, Field emphasises how talk of abstract entities *facilitates* inferences between nominalistic sentences, inferences which *could* have been made without any mention of abstract entities (e.g., (1980, 22)). By contrast, the account above rather points to sentences containing "property" with inferential roles that no finite sentence of the "old language", however complex, could have. Our accounts also differ in that Field's project is not to find a formula for eliminating commitment to a particular type of entity from any arbitrary theory. Rather, he attempts to replace whole specific scientific theories with nominalistic counterparts, but proposes no way of generalising the

method.[10]

Maddy's worry does not afflict the present response to the indispensability argument, since this response consists in a general method of replacing useful quantifications over properties wherever they may occur. There is no need to identify the "committive parts" of theories in order to eliminate only them. On the contrary, this idea is unintelligible on the present account of how to eliminate commitment to properties. There is no detachable "part" of a sentence that carries commitment to properties, but the commitment can still be eliminated without any theoretical loss and in a principled way.

The fourth and final argument from the usefulness of "property" to the existence of properties can be so-called only by a stretch, perhaps, but is nevertheless relevant in this connection. I have in mind Plato's argument of the One over Many of *Republic* 596a-b (perhaps the same as the "Problem of Universals", but this will not occupy is here). I will here confine myself only to one interpretation of this argument, but it will be instructive to see how (DEP) and the response to the indispensability argument above can be applied in this case.

The argument begins: A general term applies to certain objects in virtue of something, but this can be only their *having a certain property* (Form, universal, etc.). One might now retort, in the spirit of Devitt (1980), that it suffices to say that "red" applies to something iff it is red, and so on. But, the argument continues, we want to say *in general* in virtue of what a general term applies to an object. We can do this by saying that for every term and object, there is a property such that the term applies to the object just in case the object has the property. But, so it is argued, we cannot state this kind of general condition without commitment to properties (Forms, universals, etc.) (cf. Lewis's (1983, 355) objection against Devitt).

Assuming that the generalisation must use ordinary nominal quantifiers, this claim

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[10] Field's famous conservativeness argument is also distinct from anything I have had to say. This argument is based on a general assumption about the necessity of mathematics, and thus does not, like my response to the indispensability argument, concern any particular abstract term. It might of course *independently* support the assumptions I use to respond to the indispensability argument, but I will not try to establish this here.

is probably true, and reflects the expressive benefits of property talk. However, we can equally generalise over the Devittian instances with predicational quantifiers, as in, "$\forall t \forall x \exists F(t$ applies to x iff $F(x))$". Hence, the argument is inconclusive in that it still needs to be shown why we should prefer nominal over predicational quantification.[11][*]

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[11] Another common objection against property-nominalism is that it allows no way of explaining in virtue of what a given red thing is red (for instance). But the assumption that this kind of fact needs explaining at all has not been properly supported. Some facts need to be taken as basic, and it is more plausible to take as basic the fact that a given thing is red than the fact that it has the property of redness. Indeed, non-causal explanations or grounding relations essentially seem to run from the simpler to the more complex (cf. Schnieder (2006c)). The same reasoning applies to the charge that properties must be posited as truth-makers of ordinary predications. No proper argument has been given for claiming that we need to say more about this than that "Mars is red" is true because Mars is red, and so on (cf. Horwich (2010, Ch. 14)).

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