Truth via Sentential Quantification[1]

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1. Introduction

Many authors have pointed out that a central intuition about truth can be illuminated by a list like the following one:

> (1) That Plato has wisdom is true iff Plato has wisdom;
> (2) That Plato has courage is true iff Plato has courage;
> (3) . . .

We can say that (1) to (2) are partial definitions of truth (see Tarski 1999, p. 120). (1) explains wherein the truth (falsity) of the proposition that Plato has wisdom consists in, and so on. How can we get from *infinitely* many partial definitions to *one* complete and *finitely* expressible definition of truth? Theories of truth can be distinguished by the answers they give to this question.[2] Here is an (incomplete) overview that will help to bring the issues to be discussed in this essay into focus:

Stubborn Aristotelianism: If all entries in our list were like the first two, we could say with Bolzano in his *Wissenschaftslehre* (1929, Vol. 1, p. 112):

> A proposition is true iff it represents a thing and this thing has indeed the property the proposition ascribes to it.

Bolzano will refine this formulation, but an obvious problem remains in the refinement. For instance, one entry in our list will be:

> That it never rains in Southern California is true iff it never rains in Southern California.

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Prima facie, the sentence "It never rains in Southern California" does not express a proposition, in which a property is attributed to something. Hence, Bolzano's definition of truth cannot be applied.

Bolzano tries to explain away such recalcitrant sentences. He holds that natural language often misleads us about the structure of propositions. Hence, he aims to pair every recalcitrant natural language sentence with a sentence of the form "A has b" that expresses the same proposition. If Bolzano's paraphrasis program were successful, he could keep the definition of truth simple. Elsewhere (1997) I have given reasons to believe that Bolzano's program is a failure. If these reasons are convincing, theorists of truth would better look for a way to say what truths of different forms have in common. The recent literature has been dominated by two attempts to do this:

Minimalism (Horwich 1998, §1): Minimalists collect the items on our list via the schema "<p> is true iff p." They hold that a thinker possesses the concept of truth iff she is primitively compelled to accept those (non-paradoxical) instances of the schema she understands.

Semantic Definition (Tarski 1935, 1999): The semantic definition of truth takes all entries in the infinitely long list to be theorems that can be deduced from a finite list of axioms assigning semantic values to the primitive expressions of the language and suitable principles of composition.

Wolfgang Künne explores in the constructive part of his book *Conceptions of Truth* an often-neglected alternative proposal:

Definition via Quantification: Künne defines the truth-predicate thus:

(MOD): x is true iff $(\exists p)$ (x = [p] & p)
[For "[p]" read "(the proposition) that p."]
(p. 337; see also Kalderon 1997, pp. 490ff., and Soames 1999, p. 48)

In (MOD) the existential quantifier binds a sentential variable, i.e., a variable whose permissible substituends are sentences.

(MOD) does not presuppose an assumption about the structure of propositions. Moreover, if true, it would not be necessary to give a recursive definition of truth for different forms of propositions. (MOD) has attractive features, but many philosophers will find the use of sentential quantification problematic. In his defence of (MOD), Künne discusses in an illuminating way arguments against sentential quantification (see chap. 6.2.3). I found his reasons to acknowledge non-nominal quantification convincing. However, I will argue that we should not interpret non-nominal quantification as objectual; non-nominal quantification is neither objec-

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tual nor substitutional, but *sui generis*. It is a way of talking generally that does not create new ontological commitments. After introducing the problem, I will discuss and reject as unconvincing arguments *for* the objectual understanding of sentential quantification. I will close by outlining three arguments *against* the objectual understanding.

2. Non-Nominal Quantification

First-order predicate logic allows for quantification only into singular-term position; quantification into other positions is usually called "non-nominal quantification." We have good reason to accept non-nominal quantification, since otherwise we would not be able to codify natural language inferences that appear valid. We quantify in natural language:

• into predicate position:[3]
(EG1) Jean-Paul is sexy. Therefore: Jean-Paul is something.
(U1) Everything Madonna is, Britney is, too.

• into adverb position:
(EG2) Jean-Paul dances slowly in the ballroom. Therefore: Jean-Paul dances somehow somewhere.
(U2) If Madonna kisses somehow, Britney kisses likewise.

• into verb position:
(EG3) Peter dances. Therefore, Peter does something.
(U2) Whatever Madonna does, Britney does, too.

One should expect that we could continue this list with sentences quantifying into sentence position. But here the going gets tough. The quantifier in the following sentence is nominal:

> There is at least one thing that is true, namely, *that Paris is beautiful in spring.*

In natural language non-nominal quantifiers are constructed from questions:

> Where – Somewhere/Wherever
> How – Somehow/However
> Who – Whoever

Unfortunately we do not ask Yes/No questions with special question words. Arthur Prior (1971, p. 37) thought that the way we describe such questions ("He asked *whether* London is bigger than Tokyo") can be used to introduce sentential quantifiers:

> Whether – Somewhether/Anywhether

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Why should we introduce sentential quantifiers when they do not clearly belong to natural language? Because we have good theoretical reasons to postulate such quantifiers. One such reason is that it helps to clarify intuitions that we have about knowledge, truth, and truth-making that otherwise become distorted. For instance, Williamson (1999) argues that if we regiment the slogan "No truth without a truth-maker" with a nominal quantifier, we get in trouble; if we use it as a sentential quantifier, we get a logical truth.

However, it would be good if we had more intuitive motivation for sentential quantifiers from natural language. Like Prior, Künne takes further inspiration from Wittgenstein's thesis that the general propositional form is "things are thus and so." This expression is of sentential complexity and it can be used as a pro-sentence. It is at least tempting to render

> If he says that *things are thus and so*, then *things are thus and so*

as a sentential quantification. Both occurrences of "things are thus and so" must be instantiated by complete sentences.

In the best-case scenario, we understand sentential quantification on the basis of natural-language examples, in the worst-case scenario we must extend non-nominal quantification in natural language by analogy to introduce sentential quantifiers.

Is non-nominal quantification not just substitutional quantification? To answer this, let us concentrate on sentential quantification. Künne's answer is "no." His main argument is that the sentence

> Some truths can only be expressed in a language which humans are constitutionally unable to master (p. 360)

"cannot yield a truth unless you include in the class of permissible substituends sentences of humanly incomprehensible languages" (ibid.).

However, this seems to me to be only an *ad hominem* argument against the substitutionalist. Why should the substitutionalist not include such expressions among his potential substituends for the sentential variables? Künne says that "he has never seen friends of substitutional quantification cast their net that wide" (ibid.). But what hinders them to do it? A stronger argument might use the idea that some facts cannot be expressed in *any* language. There are uncountably many real numbers, but there can only be countably many expressions. Now take "There is some well ordering of the real numbers that has a first element." This is true, but no well ordering of the real numbers can be named in any language. If that is true, there will be propositions unexpressible (namely, ones about properties of the well ordering) in any language, whether humanly comprehensible or not.

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3. Sentential Quantification and Ontological Commitment

Is non-nominal quantification quantification over something? Philosophers like Prior and Boolos answer "no." They use non-nominal quantification to dodge ontological commitments either by turning nominal quantifiers into non-nominal ones or by resisting an assimilation of nominal quantifiers to nominal ones. For instance, it would be a mistake to read:

"(∃G) (Ga & ¬ Gb)"

as

"There is property G that a has and b lacks."

One nominalist reading takes predicate variables to be the formal pendants of plural terms of natural language:

There are some things such that a is one of them and b is not one of them.

No properties or classes are quantified over here.

Nominalists use this as a starting point for an argument that our talk never commits us to properties, classes, or propositions. If we can express the truths of second-order logic without bringing properties or classes into the picture, why should we be committed to anything other than the values of our first-order variables? The standard reply is that, since we have designations for properties, classes, and propositions, they *are* the values of first-order variables. For instance, the inference

Logicism is false.
Hence, there is something such that it is false.

seems hardly controversial. Here propositions are in the value range of a first-order variable. This reply puts a heavy burden on the nominalist: he must have a good story about *prima facie* true sentences containing designations of abstract objects. Künne's discussion of Truth-Nihilism makes clear how heavy this burden is. There is no plausible paraphrase of names like "Logicism" that turns them into expressions that involve whole sentences. I will not try to answer that challenge; I will only argue that non-nominal quantification is ontologically neutral.[4] This is only a part of the complete nominalist story.

The view just sketched contrasts sharply with Künne's position in *Conceptions of Truth*. He takes non-nominal quantification to be objectual quantification over things like properties, propositions, etc.:

> The sentential quantifier on the right-hand side of (MOD) subserves *higher-order quantification over propositions*. So it is objectual quantification, after all: the

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> bound variable 'p' is associated with a range of objects, viz. propositions, which are its values. But since it is quantification into sentence position, it is not nominal (or first-order) quantification: permissible substituends for 'p' do not designate, but rather express the values of the variable. (p. 360; emphasis in the original)

A sentence in which a sentential quantifier binds a sentential variable is true iff the open sentence, which we get by removing the sentential quantifier, is satisfied by a proposition.

To anticipate: I think we have good reasons to say that non-nominal quantification does not quantify over anything. If that is true, it backfires on (MOD). (MOD) sets the range of a first-order variable to be the same as the range of a sentential variable (see Soames 1999, p. 48). If sentential variables have no range, we cannot set them to be the same as the range of a first-order variable. So we have theoretically important disagreement. Let us try to decide it.

4. Sentential Quantification and Objectual Quantification

4.1. Why Sentential Quantification Should Be Objectual Quantification

Conceptions of Truth advances the objectual reading of the sentential quantifiers as a proposal. It does not contain an explicit argument for this view, but two arguments are suggested (without being endorsed). I think it is informative to discuss the suggested arguments to learn more about the position.

Pro-Objectual Argument 1: Künne (p. 361) endorses Mark Richard's criticism of Prior's thesis that sentential quantification is not quantification over propositions. If Prior's view is false, the objectual reading of sentential quantification becomes plausible. Richard argues against Prior along the following lines (see Richard 1996, pp. 439-42): If we do not give an account of quantification in terms of the satisfaction of open sentences we cannot assign with finite means truth-values to an infinity of sentences. Making such assignments is crucial for a complete semantic description of language. Hence, a satisfactory account of non-nominal quantificational language must be in terms of satisfaction and objects.

This argument seems to me to be a *non-sequitur*. We need, of course, a semantic account of sentences containing sentential quantifiers that assigns with finite means truth-values to a (potential) infinity of sentences. But such an account can be given without using the notion of satisfaction of open sentences in the meta-language. Indeed, if we take sentential quantification to be irreducible, any explanation in terms of satisfaction and sequences, etc., must be incorrect. Williamson points us in the direction of the right account:

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> The intended semantics for quantification into sentence position will be structurally similar to the semantics for quantification into name position, but it will employ quantification into sentence position in the meta-language. (1999, p. 263)

Here is a *sketch* of Hugly and Sayward's semantics for sentential quantifiers that follows Williamson's suggestion (1996, chap. 14):

Syntax:

> ∃sA is a wff if A is wff formula (s is a meta-language variable, the values of which are the sentential variables of the object-language)

Interpretation:

> For each sentential variable s there is one P such that a model m of L interprets s to say that P (P is a sentential variable of the meta-language; "one" can be eliminated by definition with sentential variables).

Truth:

> A is true in m iff for some P, A says that P in m and it is true that P.
> ∃sA is true in m iff A is true in a model m* which differs at most from m in the interpretation of s.

The last axiom is analogous to Tarski's semantic axiom for the (nominal) existential quantifier.

Hence, we can give a recursive semantics for sentential quantifiers by re-deploying them in the meta-language. But how do we understand our meta-language? We cannot define sentential quantifiers in terms of satisfaction without providing the object-language sentences with sentential quantifiers with wrong truth-conditions. I will argue for this below. Analogies will help us to fix on the right meaning with which we will then invest the sentential quantifiers in the meta-language. The anti-reductionist about sentential quantification is in exactly the same situation as all other proponents of theories of quantification. Try to give the semantics of the objectual existential quantifier without using objectual quantification! You cannot! (Well, you may give elimination and introduction rules. But, again, a stand off—the sententialist can do the same).

Pro-Objectual Argument 2: This argument is suggested by several examples in *Conceptions of Truth*. Take:

> Ann is lazy.
> Therefore: She has at least one vice. (p. 367)

Künne takes this argument to be valid. If so, already "Ann is lazy" seems to commit us to vices. Hence, we should understand quantification into predicate position as quantification over something that we are committed to by using the predicate.

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But how could this be? There is no designation of a vice in the premise that allows us to existentially generalize. The argument is incomplete; it needs to be completed by a further premise such as

If something is F, then and only then it has the property of being F.

Now principles like this *seem* obviously true, but we know that they can lead to paradox—just remember: if every F is a G (and *vice versa*), then and only then is the extension of F the same as the extension of G. There are different stories about the truth-grounds of these additional principles and sources of our knowledge of them (see, for instance, Yablo 2000). Whatever the story will be, the fact that we need an additional story shows that sentences without designations of propositions and properties *alone* do not commit us to accept the existence of these entities. If so, why should quantification into non-nominal positions in such sentences commit us to the existence of these things?

There seems to be no strong reason to endorse the view that sentential quantification is quantification over propositions. Still, this view may be a fruitful proposal which leads to an adequate definition of truth. In the next section I will argue that this is not so. We have strong reasons to reject the objectual reading of non-nominal quantifiers.

4.2. Why Sentential Quantification Is Not Objectual Quantification

Following are three arguments against the objectual view.

Contra-Objectual Argument 1: The Standard Reason (see Rayo and Yablo 2001, p. 81; Simons 1997, p. 267; Williamson 1999, p. 263): A true existential quantification can only commit us to the existence of the objects, which are the designata of the permissible substituends for the variables bound by the quantifier. A variable ranges over all objects of the sort that are named by its permissible substituends (Quine 1986, p. 11). The permissible substituends for the non-nominal variables are not expressions that can be said to name or refer to something, at least not without much force. Hence, non-nominal quantification does not bring new ontological commitments.

Künne has a good reply to the standard argument. The notion of having a value is different for non-nominal and nominal variables. A nominal variable ranges over all objects of the sort that are named or referred to by its permissible substituends; a sentential variable ranges over all objects of the sort expressed by its permissible substituends (see pp. 360, 362). If one wants to extend the notion of having a value in this way, one needs an answer to the question "When does a permissible substituend for a sentential variable, i.e., a sentence of a language, express a proposition?" The notion of a sentence expressing a proposition is not a pre-theoretical notion that one can simply rely on in a theory. Hence, to give a complete

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account of objectual sentential quantification, we need an informative filling of the schema:

> (∀s) (∀p) (The sentence *s* of language L expresses (in context c) the proposition that p iff . . .)

How can we fill this schema? This is a tough question, even more so, if we are not allowed to use the notion of truth. The theory of linguistic meaning can also not be relied on. Künne argues that propositions are not the linguistic meanings of assertoric sentences: they are what is asserted by an assertoric utterance of an assertoric sentence and what one comes to believe when one accepts what is said by such an utterance.

The theory we are looking for systematically maps sentences of a language to propositions, the "things said" by utterances of these sentences.[5] Davidson has made a highly influential proposal how such a pairing might be achieved. How can an interpreter come to grasp the meaning of the utterance of a sentence of an untranslated language? We must ascribe to the utterance of a sentence *s* the proposition, which makes the utterer of *s* say something true when plausibly possible, according to our own view of the situation (see Davidson 1984, p. 137). If we take the speaker's utterance of *s* to express the proposition that p, and it is false that p by our own lights, we have a good, though defeasible, reason that we have not managed to capture what the speaker said in uttering *s*. Davidson's idea can roughly be expressed thus:

> (∀s) (∀p) (The sentence s of language L expresses the proposition that p iff an interpretation of the utterances of speakers of L *that makes them say something true with their* s *utterances* assigns to their utterances of *s* the proposition that p).

The answer given to our question relies on the notion of truth (no wonder Davidson takes truth to be indefinable). This does not show that our question cannot be answered without appealing to truth; however, I take the above answer to be representative of the answers I know: they all use truth in one way or other, i.e., the proposition expressed is determined by acceptance behaviour, conventions of truthfulness and trust, etc. Hence, the idea that sentential quantification is higher-order quantification escapes the standard counter-argument only by making a risky assumption.

Contra-Objectual Argument 2: Ontological Magic and Knowledge Transfer: I think a good case can be made that "Britney is sexy" does not commit us to existence of a property Britney has or exemplifies (Evans 1982, p. 367). After all, I can be pretty much in the dark what properties are and how they are identified, etc., without my ability to understand "Britney is

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sexy" to be affected. If "Britney is sexy" does not commit us to the existence of properties, how can quantification into predicate position create a commitment to properties (see Prior 1971, p. 43; Rayo and Yablo 2001, pp. 81-82; and van Cleve 1994, p. 587)? Compare: If we quantify into singular-term position, we quantify over things whose existence we have already presupposed. The premise is stronger than the conclusion. This is the reason why an existential generalization is valid. Prior sums this line of argument up by saying that "the alleged emergence of these new ontological commitments has an almost magical air about it" (ibid.).

Here is an example that makes this point clearer. Take the true sentence "It rains sometimes." *Prima facie*, there is neither an explicit nor an implicit commitment to propositions. The argument:

It rains sometimes.
Therefore: Things are thus and so.

is complete, valid, and sound. How could this be so if the conclusion quantified over propositions?

The same point can be made by relying on uncontroversial epistemic intuitions: we all, *whether we believe in propositions or not*, know or can easily come to know via the above argument the conclusion. If sentential quantification were higher-order quantification over propositions, someone who rejects propositions could not come to know the conclusion, for his belief that there are no propositions would defeat his knowledge claim. Therefore, non-nominal quantification is not objectual. Our knowledge of the conclusion would survive the addition of a nominalist doctrine to our evidence.

Contra-Objectual Argument 3: Existential Generalizations without Higher-Order Objects (see van Cleve 1994, p. 582, for properties; Rayo and Yablo 2001, p. 82, for sets): Take the argument:

(P1) The property of being yellow is non-self-exemplifying.
(P2) The property of being green is non-self-exemplifying.
(K) There is something that both the property of being yellow and the property of being green are: namely, non-self-exemplifying.

The premises of this argument are true: being yellow is not yellow, being green is not green; hence, both are non-self-exemplifying. And the argument seems valid and complete. Now we know that the expression "being non-self-exemplifying" cannot refer to a property (Künne agrees [see p. 56]). If there were such a property, we could ask whether it exemplifies itself and we would get the property-theoretic analogue to Russell's paradox. Hence, if non-nominal quantification were objectual quantification over properties, the argument would lead from true premises to a false

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conclusion. There is no property that satisfies (in an extended sense) the open sentence "The property of being yellow and the property of being green are F." If quantification into predicate position were objectual, the argument would be neither sound nor valid. But the argument is valid and sound; hence, quantification into predicate position is not objectual.

Similar arguments can be construed for other quantifications. Unfortunately, I could not come up with a similar argument for quantification into sentence position. But non-nominal quantification comes as a package deal. *Prima facie*, all forms of non-nominal quantification should be treated similarly. Künne's theory of truth does not allow us to do so. If we have no independent reason to single out as special quantification into sentence position, we should treat all forms of non-nominal quantification in the same way.

The moral: Non-nominal quantification is not higher-order quantification over things. We should reassess (MOD) in the light of this result.

Notes

1 Thanks to David Galloway, Keith Hossack, David Papineau, Richard Samuels, and Gabriel Segal for helpful comments on short notice.

2 This concept of truth will presumably generate the Liar paradox. But that is simply a fact about our concept of truth: it is glitchy. How to avoid or repair the glitch is not relevant to descriptive theories of truth under discussion here.

3 "Predicate position" is incorrect, but now widely established, terminology.

4 See Yablo 1996 for a motivation of nominalism that appeals to non-nominal quantification and defends it without paraphrasing away designations of abstract objects.

5 I ignore all additional complications: context-dependence, non-indicative utterances, vagueness, etc. Douglas Patterson's contribution in this volume deals with this problem in more detail.

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