Disquotationalism and the Compositional Principles

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... [S]emantics... is a sober and modest discipline which has no pretensions of being a universal patent-medicine for all the diseases of mankind, whether imaginary or real. You will not find in semantics any remedy for decayed teeth or illusions of grandeur or class conflicts. Nor is semantics a device for establishing that everyone except the speaker and his friends is speaking nonsense. (Tarski, 1944, p. 345)

In their paper “The Use of Force Against Deflationism”, Dorit Bar-On and Keith Simmons (2007, p. 61) helpfully distinguish three sorts of deflationary theses about truth. Metaphysical deflationism is a thesis about the property of truth, namely, that it is insubstantial, or that it has no essential nature, so that a theory of truth—a correspondence or coherence theory of truth, say—is both unnecessary and impossible. Linguistic deflationism is a thesis about the word “true”, namely, that its meaning is adequately explained by Alfred Tarski’s schema (T) or something along the same lines. Conceptual deflationism is a thesis about the role the notion of truth may legitimately play in our theorizing, namely, that there are no interesting connections between truth and other concepts, such as meaning or belief. Rather, the word “true” plays only an ‘expressive’ function, allowing us to state certain claims that we could not state without it, but playing no essential explanatory role (see e.g. Field, 1994, §5; Williams, 1999, p. 547).

Most deflationists seem to regard the linguistic thesis as fundamental. Exactly how the metaphysical thesis is supposed to follow from it has never been clear to me, probably because I do not understand what it is supposed to mean that truth is not a ‘substantial property’ (cf. Field, 1994, p. 265, n. 19). But the real issue, in any event, concerns the
conceptual thesis. And here, it is clear, deflationists have generally regarded it as following from the linguistic thesis: Surely an expression that is explained in terms that make it all but redundant cannot play any essential explanatory role. In practice, the argument for this claim takes a form first used explicitly by Paul Horwich (1990). The work the notion of truth appears to do in various settings, it is claimed, can in fact be done entirely by a notion of truth that is stipulatively introduced in accordance with the requirements of linguistic deflationism. So the dialectic consists of the anti-deflationist’s identifying some theoretical setting in which the notion of truth seems to be doing important explanatory work and the deflationist’s attempting to show that the role the truth-predicate is playing in that context is, in fact, purely expressive.

Bar-On and Simmons’s main purpose in their paper is to show that conceptual deflationism does not follow from linguistic and metaphysical deflationism. In particular, they argue that Gottlob Frege, though he was a linguistic deflationist, is not a conceptual deflationist (Bar-On and Simmons, 2007, §II) and that Robert Brandom, though he is both a linguistic and a metaphysical deflationist, is not a conceptual deflationist, either (Bar-On and Simmons, 2007, §III). More precisely, Bar-On and Simmons argue that the notion of truth plays an essential role both in Frege’s account of assertion and in Brandom’s account of ‘commitment’, and that in neither case is truth’s role merely expressive. They do not, however, actually defend Frege’s claim that assertion is the presentation of a thought as true,¹ nor Brandom’s account of commitment in terms of taking to be true, so it is open to a deflationist simply to reject those accounts. Deflationists hold that truth’s only legitimate role is expressive. They need not deny that less enlightened philosophers have tried to make other uses of it.

Frege’s own attitude toward truth is nonetheless instructive. On the one hand, Frege famously insists that “… the sentence ‘The thought that 5 is a prime number is true’ contains … the same thought as the simple ‘5 is a prime number’” (Frege, 1984c, op. 34). On the other hand, truth plays an absolutely central role in Frege’s thought about language and, in particular, in the semantics that he develops for his formal language in

¹ Mark Textor (2010) has a nice historical discussion of this aspect of Frege’s position. My own view is that there is something profoundly right about that position but that, to understand it properly, we need to see it as expressed through Frege’s thesis that the reference of a sentence is its truth-value and, therefore, that the sense of a sentence—the thought it expresses—is its truth-condition (Heck and May, 2019). Which brings us to the next paragraph.
Part I of *Grundgesetze der Arithmetik* (Frege, 2013). For Frege, the most fundamental linguistic unit, from a logical point of view, is the sentence; the most basic semantic fact about a sentence is its being true or false; and the sense of a sentence—the thought it expresses—is its truth-condition. How can Frege hold all these views? Part of what explains the apparent tension is the fact that Frege’s deflationary remarks always concern ascriptions of truth to what he called ‘thoughts’, that is, to propositions, more or less. There is no reason to think that Frege was a linguistic deflationist about sentential truth. Frege never expresses a view about the meanings of sentences like “‘Snow is white’ is true”, probably because, as Sir Peter Strawson (1950, pp. 129–31) makes clear, such attributions are extremely uncommon in ordinary language. In so far as Frege was a deflationist at all, then, he was a deflationist about propositional truth, not about sentential truth. And, in the context of Frege’s semantics, the notion of truth that is in play is one that applies not to thoughts but to sentences. So Frege is no kind of deflationist about the notion of truth that plays a role in his semantic theory.

A semantic theory of the sort Frege was the first to develop is not a ‘theory of truth’ in the sense in which the coherence theory is a theory of truth. But one need not think it is possible, or even desirable, to have a theory of truth in that sense—the sense relevant to metaphysical deflationism—to think that the notion of truth might do interesting and useful work (see e.g. Davidson, 1990, 1996, 1999). Truth-conditional semantic theories are about truth even as they are also about sentences and other linguistic items, and if the role truth plays in such theories cannot be revealed as purely expressive, then conceptual deflationism is false. But, to emphasize, the issue here concerns truth as applied to sentences, so what we need to ask is whether linguistic deflationism about sentential truth provides us with the resources to unmask the use of truth in semantics as purely expressive. To put it differently, the question is whether deflationism about sentential truth is consistent with taking semantics seriously.²

² The other part of the explanation concerns the true purpose of Frege’s deflationary remarks, which is to undermine the view that the relationship between a thought and its truth-value is that of subject to predicate rather than, as Frege thinks, that of sense to reference. For discussion, see Heck (2010) and Heck and May (2018, esp. §5).

³ The opponent of deflationism also does not need an alternative to linguistic deflationism. If there is no simple explanation of what the word “true” means, then that simply shows that it is like most other words.

⁴ It seems clear that deflationism about propositional truth is consistent with taking semantics seriously. Scott Soames (1988; 1999) holds precisely such a combination of
I shall henceforth use the now common term ‘disquotationalism’ for deflationism about sentential truth. The term comes from W. V. O. Quine:

By calling [“snow is white”] true, we call snow white. The truth predicate is a device of disquotation. . . . We need it to restore the effect of objective reference when for the sake of some generalization we have resorted to semantic ascent. (Quine, 1986, p. 12).

The linguistic part of the disquotationalist thesis is thus that the two sentences

(1) Snow is white.

(2) “Snow is white” is true.

are not just materially equivalent, but equivalent in some much stronger sense that makes the truth-predicate “dispensible when attributed to sentences that are explicitly before us” (Quine, 1987, p. 214). Quine would never call such pairs of sentences ‘synonymous’, of course. What he says instead is that “[a]scription of truth just cancels the quotation marks” (Quine, 1990, p. 80). Hartry Field expresses the same idea when he says that the two sentences are “fully cognitively equivalent” (Field, 1994, p. 250), and he explicitly regards the equivalence between (1) and (2) as a “conceptual necessity” (Field, 1994, p. 258).

This is an extremely strong claim, one that has some very odd consequences. As Field (1994, §9) both notes and emphasizes, for example, views. Semantics, as he sees it, assigns propositions to sentences (relative to contexts). Truth simply does not enter the picture. It’s a more interesting question whether deflationism of this sort is compatible with truth-conditional semantics. I think it is, but arguing the point would take more space then I have here.

5 Although, as I’ve noted elsewhere (Heck, 2019), Quine does not hold that (1) and (2) are necessarily equivalent.

6 Strictly speaking, as Field (1994, pp. 250–1) notes, the latter sentence seems committed to the existence of the sentence “Snow is white”, whereas the former sentence does not. So, officially, Field’s view is that they are fully cognitively equivalent modulo that commitment. But Field himself tends to disregard this aspect of the view, and I will tend to do so as well.

7 I’ll note, in passing, that the oft-heard claim that we learn the word “true” by learning that A is, in some strong sense, equivalent to “A is true”, is much less plausible in the case of disquotationalism than in the case of deflationism. This is because, as mentioned earlier, truth is almost never attributed to sentences in natural language, and it is not even clear that children are able to think consciously about sentences at the sort of age at which they learn the word “true”. In any event, it is plainly an empirical question how children acquire the word “true”. I know of no evidence that it is by learning a rule of disquotation.
the following is true if the truth-predicate is read disquotationally:\(^8\)

(3) Even if “snow” had meant \textit{grass}, the sentence “snow is white” would still have been true.

That is because it is equivalent to:

(4) Even if “snow” had meant \textit{grass}, snow would still have been white.

And that is because, as Field (1994, p. 266) remarks, echoing Quine, “to call ‘Snow is white’ disquotationally true is simply to call snow white…”, whether or not we are inside a modal context.\(^9\)

This is not a dispensible feature of the truth-predicate as a disquotationalist understands it. The sentence \(A\) has to be equivalent, in the strongest possible sense, to \(⌜“A”\text{ is true}⌝\) if the truth-predicate is to play the expressive role disquotationalists think it plays.\(^10\) If, for example, I say,

(5) The axioms of Euclidean geometry are not all true, but they might have been.

then Field (1994, p. 265) wants this to be a way for me to affirm the contingency of what the axioms of geometry express, \textit{not} boringly to point out that those sentences might have been true because they might have meant something different. It follows that “The axioms of Euclidean geometry are all true” must not have any extra, ‘semantic’ content but must simply express what the axioms of Euclidean geometry do. Similarly, if I were to say, “It is sometimes possible to see objects behind the sun because the axioms of Euclidean geometry are not all true”, that is supposed to be a way for me to affirm that the non-Euclidean character of space is responsible for the somewhat surprising behavior of photons, not to make the absurd claim that optics is beholden to the semantics of English.

The obvious thing to say here is that the reason (5) expresses the contingency of what the axioms express is because the ‘axioms’ are not sentences but what those sentences express. That is, truth is being

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\(^8\) If one is worried about the use of “means” in the antecedent, replace it by: Even if “snow” had been used the way “grass” is used, and conversely.

\(^9\) Hilary Putnam (1994) famously made a very similar objection to Tarski’s claim to have defined the notion of truth. But that is a different issue altogether.

\(^10\) In “A Critique of Deflationism”, Anil Gupta (1993) hammers this point repeatedly, especially in §III.
predicated not of sentences but of propositions (Heck, 2004, §2). But this is not a line that a disquotationalist can take, since invoking propositions threatens to commit us to a substantial notion of representational content, which is part of what disquotationalism opposes (Field, 1994, pp. 266–7). A disquotationalist precisely does not want to understand attributions of truth to sentences in terms of the truth of the proposition the sentence expresses. Rather, the disquotationalist view is that attributions of truth to sentences are to be treated as primitive, and they are to be understood in terms of disquotation.\footnote{Ultimately, disquotationalism is not so much a view about truth as it is a view about content: It is the denial that truth conditions have any significant role to play in the theory of mind and language (Field, 1994, §1).}

Still, it is often useful, when one is trying to understand what a disquotational truth-predicate is, to compare it to a propositional truth-predicate. The claim that $A$ and \( \text{⌜It is true that } A \text{⌝} \) are equivalent in some very strong sense seems reasonable.\footnote{Modulo, as Marian David (2005, p. 387) points out, the commitment to the proposition that $A$. Compare note 6. I'll now stop pointing out this kind of caveat. Consider it included throughout in what follows.} For that reason,

(6) Even if “snow” had meant grass, it would still have been true that snow was white.

is unproblematically true. But the disquotationalist's (3) is intended to be equivalent to (6), though it uses a sentential truth-predicate rather than a propositional one, so as to avoid the commitment to propositions. When “true” is read disquotationally, then, \( \text{⌜“A” is true} \) is supposed to be just as obviously equivalent to $A$ as \( \text{⌜It is true that } A \text{⌝} \) is.

A different way to reach the same conclusion is to note that, if \( \text{⌜“A” is true} \) had some content beyond that of $A$ itself, then that content could well be essential to putative explanations in which attributions of truth appeared. It would not follow that conceptual disquotationalism was false, but the typical strategy for establishing it would no longer be available: Uses of the truth-predicate could not simply be eliminated in the way disquotationalists propose, even when truth was ascribed to a single, explicitly specified sentence, let alone when it was used in generalizations, as it is in semantics.

A simple example of such a generalization is:

(7) A conjunction is true iff both of its conjuncts are true.
Following Field (2005), I shall call such generalizations ‘compositional principles’. And the main question I want to discuss in the remainder of this chapter is how disquotationalists should understand the use of the truth-predicate in such principles, which are central to certain sorts of semantic theories. Even in (7), the use of the truth-predicate is supposed to be ‘purely expressive’. What I want to know is: How so exactly?

I shall argue in section 1 that the truth-predicate is not being used in (7) to express an infinite conjunction, as is often suggested. I shall then turn, in section 2, to an older question, namely, what right disquotationalists even have to compositional principles. As we shall see, Field (2005) has offered an answer to this question, one that also yields an answer to the question what expressive role a disquotationalist should regard truth as playing in compositional principles. I shall argue in section 3, however, that Field’s method for generating compositional principles over-generates and argue, in section 4, that this reveals a deeper problem, which is that what Field’s method generates simply are not compositional principles as they are understood in semantic theory. In particular, part of what (7) is typically understood to express is that conjunction is truth-functional. But, if the truth-predicate as it occurs in (7) is read disquotationally, then (7) is compatible with conjunction’s not being truth-functional. In section 6, I will reinforce this point with a brief history of truth-functionality and then, in section 7, extend it by looking even more briefly at corresponding issues concerning quantification.

Let me acknowledge something in advance. I shall be arguing that disquotationalism is committed to claims that may seem so absurd that no one could possibly accept them. This is worrying. But they are no more absurd than (3), in the end, and they flow from exactly the same source: the insistence that the primary function of “is true” is simply to erase quotation marks. That, obviously, is the very core of the view.

1 What Expressive Role Does ‘True’ Play in Compositional Principles?

As mentioned above, disquotationalists regard the truth-predicate as merely an ‘expressive’ device. People sometimes put this point by saying

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13 I will focus here on truth-theoretic semantics, but it should be clear, I hope, that nothing depends upon this restriction. The disquotationalist’s task would only be harder if we were discussing a semantic theory that made use of more complex sorts of semantic values.
that the truth-predicate allows us to make generalizations we could not make without it. But the slogan can’t just mean that. Every predicate allows us to make generalizations we could not make without it. For example, the predicate “blue” allows us to express the generalization “All pigs are blue”, which we could not express if we did not have the word “blue” in our language (or a synonym). So the disquotationalist slogan must mean something else. Which, of course, it does.

When disquotationalists characterize the truth-predicate as a ‘device of generalization’, what they mean is that it gives us a way to express generalizations all of whose instances we can already assert. It’s just the generalization that we can’t assert. That distinguishes the cases involving “true” from the case of “All pigs are blue”. Not even the instances of “All pigs are blue” can be asserted without the use of “blue”. More precisely still, the truth-predicate is supposed to act as a ‘device of infinite conjunction’ (Field, 1994, §5; Halbach, 1999). In the cases of interest, we shall be able to assert the various instances of some generalization, but, because there are infinitely many such instances, we cannot actually assert them all, absent some mechanism for forming infinite conjunctions, which is exactly what the truth-predicate is supposed to allow us to do.

Consider, for example, the law of excluded middle:

(8) Every sentence of the form $A \lor \neg A$ is true.

The disquotationalist’s suggestion is that (8) means no more and no less than that either Bill smokes or Bill does not smoke, and either Fred runs or Fred does not run, and so forth. The individual instances—“Either Bill smokes or Bill does not smoke”, “Either Fred runs or Fred does not run”—have nothing to do with truth. To express the generalization, of course, what we need to do is quantify over these instances. What we seem to want to say is thus something like:

(9) For all $S$, if $S$ is of the form $A \lor \neg A$, then $S$.

But that, familiarly, is ill-formed, since $S$ is occupying both term and sentence positions. What the truth-predicate does, according to disquotationalists, is to solve this syntactic problem by converting the position occupied by a sentence into one occupied by a term: “Fred runs or Fred does not run” is replaced by “‘Fred runs or Fred does not run’ is true”, and our generalization can then expressed as:

\[14\] I set aside, for present purposes, issues about context-dependence, though my own view is that these are very serious indeed (Heck, 2019, §3.2).
For all $S$, if $S$ is of the form $A \lor \neg A$, then $S$ is true.

All we’re trying to do here, or so disquotationalists say, is to wrap the instances of $A \lor \neg A$ into a neat package and affirm them, all at once. The role the truth-predicate is playing is thus purely grammatical, and (10) means no more than what (9) was supposed to mean: It simply expresses the infinite conjunction that either Bill smokes or Bill does not smoke, and either Fred runs or Fred does not run, and so forth. In particular, (10) has no more to do with truth, semantics, or logic than would that infinite conjunction, if only we could write it down.

There are several difficulties with this idea. It is, first of all, a very delicate matter just how we should understand the claim that such truth-attributions such as (8) express infinite conjunctions. As Gupta (1993, §III) argues, “express” here has to be understood in a very strong sense—which makes it surprising that so little effort has been made to articulate what that sense is. The only serious attempt of which I am aware, due to Volker Halbach (1999), cannot be regarded as successful (Heck, 2004, pp. 330–2). Worse, as Gupta also notes, this sort of proposal appears to conflate the truth of a generalization with the joint truth of its instances. The statement that all sentences of the form $A \lor \neg A$ are true has nothing to do with which instances of that form happen to be present in the language. On the contrary, it is supposed to be a law: It is supposed to be, in the usual sense, ‘projectible’. Even if new sentences are added to our language, so that $A \lor \neg A$ comes to have new instances, those too are required to be true.

I shall not pursue these complaints further here, however, as sympathetic with them as I may be. There is a more important point in the vicinity: Compositional principles simply are not statements in which the truth-predicate is plausibly being used as a device of infinite conjunction.\footnote{I have made this point before (Heck, 2004, pp. 331–2), but in a somewhat different context and without sufficient emphasis. Halbach (2001, p. 192, fn. 26) seems to agree with it.}

The problem is very simple. The only ‘infinite conjunction’ we might plausibly take (7) to express is far too weak to have any chance of being what it actually does express. Formalize (7) as:

\[ \forall x \forall y [T(\langle x \land \neg y \rangle) \equiv T(x) \land T(y)] \]

Which sentences not involving the truth-predicate are supposed to count
as instances of the infinite conjunction allegedly expressed by (11)\(^\text{16}\) It is hard to see what they might be if not sentences of the form: \(A \land B \equiv A \land B\), so that (11) expresses the infinite conjunction of such claims as “Fred runs and Bill walks iff Fred runs and Bill walks”, that is, the infinite conjunction of a bunch of instances of \(p \equiv p\). That might sound like music to the disquotationalist’s ears. But it should not.

Consider these two generalizations:

(12) \(\forall x \forall y [T(⌜x \land y⌝) \equiv T(⌜x \land y⌝)]\)

(13) \(\forall x \forall y [T(⌜x \land y \equiv x \land y⌝)]\)

If (11) is supposed to express an infinite conjunction, then presumably these do, as well. And there appears to be no option but to take them, too, to express the conjunction of all sentences of the form: \(A \land B \equiv A \land B\). But these are all very different. For example, (12) is logically valid. And, while (13) is not itself logically valid, it follows from any set of principles entailing that all instances of a truth-functionally valid schema are true (for example, that very principle).\(^\text{17}\) But (11), together with similar principles, at least, has significant logical strength (Heck, 2015, 2018a).

The point, then, is that (11), (12), and (13) have very different logical properties. It follows, or so it seems to me, that they cannot all express the same infinite conjunction. On the contrary, at most one of them can express the infinite conjunction of sentences of the form: \(A \land B \equiv A \land B\). But if any of these expresses that infinite conjunction, then surely it is (13), which does so in precisely the sense in which \(\forall x [T(⌜¬x⌝) \equiv ¬T(x)]\) expresses the conjunction of instances of the law of excluded middle. But then (11) does not express that infinite conjunction, and there is no other infinite conjunction it plausibly does express.

The point applies to other compositional principles as well, such as:

(14) \(\forall x [T(⌜¬x⌝) \equiv ¬T(x)]\)

If (14) expresses an infinite conjunction, it can only be the conjunction of all sentences of the form: \(¬A \equiv ¬A\). But, if so, then that same infinite conjunction seems equally to be what is expressed by these two generalizations:

\(^{16}\) One might think that (11) should express an infinite conjunction of infinite conjunctions, but this does not evade the problem, since the terms of that conjunction are the same as in the cases we shall discuss, and the difference is only one of grouping.

\(^{17}\) The notion of a tautology is definable in PA, so we can interpret a theory containing that principle in one with, say, just the T-sentences by re-interpreting \(T(x)\) to mean: \(T(x)\), in the old sense, or \(x\) is a tautology.
(15) \( \forall x [T(\neg x) \equiv T(\neg x)] \)

(16) \( \forall x [T(\neg x \equiv \neg x)] \)

Once again, (14), (15), and (16) have very different logical properties, and at most one of them can express the infinite conjunction of all sentences of the form: \( \neg A \equiv \neg A \). But (16) expresses that conjunction if anything does, so (14) does not express it.

I have heard it said in conversation that disquotationalists do not really mean that ‘true’ is always used to express infinite conjunctions, but that this is its ‘purpose’ or ‘role’ in our language. But I have no idea what to make of such teleological claims. Most words do not have ‘purposes’, except to allow us to express whatever concepts they are used to express, and I see no reason to regard “true” as different from other words in this respect. Moreover, even if the truth-predicate had been explicitly introduced so as to allow us to express infinite conjunctions, it would not follow that, once we had it, we could not use it for quite different purposes, including ones that involved truth’s playing a significant explanatory role.\(^{18}\) The disquotationalist therefore owes us an answer to the question what ‘purely expressive’ role the truth-predicate plays in compositional principles, if it is not to allow us to formulate infinite conjunctions.

2 Disquotationalist Derivations of Compositional Principles

Disquotationalists often seem to be of two minds about compositional principles. On the one hand, for example, Field (1994, p. 269) insists that “... compositional principles have no interest in their own right”. On the other hand, however, Field is of course aware that there are those who find such principles as:

(7) A conjunction is true iff both of its conjuncts are true.

to be of substantial interest. So he wants to be able to explain both why such principles are true, when they are, and why they are nonetheless insubstantial and can do no explanatory work.

There is a history to this issue. In his book *Truth*, which helped launch contemporary deflationism, Horwich suggested that we can get

\(^{18}\) In essentials, I owe this point to Jamie Tappenden, who once remarked that, even if the extension of the truth-predicate is fixed by something like Convention (T), it does not follow that we cannot go on to theorize about the set of true sentences and formulate possibly significant generalizations about it. Vann McGee (2005, p. 144) has since made essentially the same point.
everything we need to know about truth from the ‘minimal’ theory that consists just of the T-sentences.\textsuperscript{19} It is obvious, however, that a theory of truth containing just the T-sentences is very, very weak. Without such principles as (7), it’s hard to see how such a truth-predicate could be of much use at all. It certainly could not be used for the sorts of purposes for which the truth-predicate is typically used in logic.\textsuperscript{20}

One might well think, however, that the compositional principles can be derived from the T-sentences—or, better, from the ‘T-scheme’, thought of as an axiom scheme having the T-sentences themselves as instances. The argument proceeds as follows:\textsuperscript{21}

(i) “\(A\) and \(B\)” is true iff \(A\) and \(B\).

(ii) “\(A\)” is true iff \(A\).

(iii) “\(B\)” is true iff \(B\).

(iv) “\(A\) and \(B\)” is true iff “\(A\)” is true and “\(B\)” is true.

The first three steps are delivered by the T-scheme; the last then follows by simple propositional reasoning.

\textit{Prima facie}, this argument has two serious problems. First, it does not appear to be an argument at all. An argument consists of a sequence of claims allegedly related in some relevant way (e.g., deductively). But this ‘argument’ does not consist of a sequence of claims, and it is not at all obvious how to interpret it. This leads to the second problem: In so far as one does have some idea how to interpret this argument, one wants to regard “\(A\)” and “\(B\)” as variables. But then these variables appear both

\textsuperscript{19} Horwich’s discussion proceeds in terms of propositional truth, and so his position in \textit{Truth} is not obviously disquotationalist. But Horwich is, in fact, committed to disquotationalism, since he is also committed to a deflationist view of meaning (Horwich, 1998).

\textsuperscript{20} Here’s an example. Let \(T\) be a theory. Suppose we have a theory of truth for \(T\) that allows us to prove the T-sentences. Then, if \(T\) is finitely axiomatized, we will also be able to prove, pretty trivially, that all of \(T\)’s axioms are true. But what if \(T\) is not finitely axiomatized, but only finitely axiomatizable? In that case, we cannot, in general, prove that \textit{all} of \(T\)’s axioms are true, though we can prove that \textit{each} of them is. To prove the stronger claim, we typically need to appeal to compositional principles (Heck, 2015, §3.4).

\textsuperscript{21} This sort of argument is outlined by Field (1994, pp. 258–9), who actually discusses the case of disjunction. I’ll discuss conjunction, for reasons that will become clear below. There are similar arguments to be found in the writings of many others. I learned of such arguments as a student from Sir Michael Dummett, who discusses something similar in \textit{The Logical Basis of Metaphysics} (Dummett, 1991, pp. 56ff).
inside and outside quotation marks, something that is usually regarded as problematic.

One charitable way to interpret the ‘argument’ is to regard it not as an argument but as an argument schema. So understood, however, the argument fails to show what its proponents claim it shows. What the schematic argument shows is that we can prove every instance of the compositional principle for conjunction. That, as Gupta (1993, p. 67) emphasizes, is not at all the same thing as being able to prove (7) itself. Indeed, if our background logic is first-order logic, or some other logic for which the compactness theorem holds, the generalization (7) cannot follow from its infinitely many instances. Otherwise, it would have to follow from finitely many of them, which it obviously does not (Shapiro, 1998, p. 496).

One might think the disquotationalist can simply concede this point. What the disquotationalist needs to show is that an ‘insubstantial’ theory of truth can do the work for which a ‘substantial’ theory of truth is supposed to be needed. The suggestion, then, in response to the foregoing, would be that what needs amending is the proposed content of that ‘insubstantial’ theory: It should not contain just the T-sentences, or something of the sort, but also the sorts of generalizations we’ve been discussing. That is: The disquotationalist should just claim the compositional principles as their own.

Not only would this reply simply beg the question whether the disquotationalist actually has a right to the compositional principles, however, it is utterly ad hoc. The suggestion is that we should add generalizations like (7) to the ‘minimal’ theory containing just the T-sentences. But which generalizations are ‘like’ (7)? Discussion of these issues tends to idealize by taking the language to which the truth-predicate applies to be a formal (usually first-order) language. And, in that case, we know well enough which compositional principles will be needed to allow us to make the generalizations the truth-predicate typically allows us to make. But disquotationalism isn’t a view about truth as applied only to the sentences of formal languages. Truth, at least as it is used in

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22 This sort of suggestion was made during the discussion period when I presented some of this material at Princeton in 2009. Cezary Cieśliński (2010, p. 412) comes close to making it in print in his discussion of the conservativeness argument against deflationism. He seems simply to assume, however, that the deflationist is entitled to the compositional principles when he adopts that he calls PA(S)⁻ as his base theory. That entitlement is precisely what I am questioning here.

23 It isn’t always clear whether disquotationalism is supposed to be a ‘revolutionary’ or
semantics, applies to sentences of natural language. But then there is no clear limit to the sorts of compositional principles we will need to add. Indeed, if we take the case of first-order languages as our model, then, in that case, what we need to add to the minimal theory, to make it do the work we need it to do, is a full-blown Tarski-style theory of truth, as Field (1999, pp. 534–5) himself has noted. That makes me suspect that, in the case of a natural language, what would be needed is what would, from a different point of view, be regarded as constituting a full semantic theory for the language in question. That makes the question what right a disquotationalist has to compositional principles pressing once again. Compositional principles are the very principles that semantic theories articulate, and truth appears to play a substantial role in such theories. If so, then “Disquotationalism doesn’t work without the compositional principles, so we’d better add them” looks worryingly like another way of saying “Disquotationalism doesn’t work, so we shouldn’t be disquotationalists”.

If something like the schematic argument rehearsed on page 12 could be resuscitated, however, then the problems we have been discussing would vanish. In light of our discussion in section 1, however, the disquotationalist must abandon the claim that the compositional principles express infinite conjunctions; in light of Gupta’s criticisms, they must also abandon the claim that compositional principles simply follow from their instances. But the possibility is still open, at least in principle, that the compositional principles should follow from certain general principles about truth that the disquotationalist anyway accepts, in particular, that they should follow from the T-scheme, itself understood as having a certain kind of generality, rather than simply as a convenient way of summarizing the infinite list of its instances. A form of this proposal has been developed by Field (2005).

The contrast to which I have just alluded, between two ways of understanding the T-scheme, is one that has been of significant interest to philosophers of logic and mathematics. Consider, for example, the induction scheme of Peano arithmetic:

(17) \( A(0) \land \forall x (A(x) \rightarrow A(Sx)) \rightarrow \forall x A(x) \)

There are two says of understanding this scheme. One is to take it as simply a convenient shorthand for the infinite list of ‘induction axioms’...
of PA. The other is to regard it as having a kind of generality, so that the scheme itself is, in some sense, the real axiom.

The contrast emerges when we consider what ought to happen when we expand the language of PA, say, by adding a function-symbol for exponentiation. If we understand the induction scheme in the first way, so that it is just a compact way of summarizing the real axioms, of which there are infinitely many, then it is of no significance that the expansion of the language introduces new sentences of the same form as the induction axioms we already accept. The fact that the axioms we accept have a common form is of no interest beyond the fact that it permits such a compact summary of them. We might call such a conception of the induction scheme static.

On the other way of understanding the scheme, (17) is not just a compact way of listing a bunch of axioms. The common form of those axioms is precisely what is of interest. The fact that the expanded language contains new sentences of that form then does provide us with new axioms. The scheme is thus dynamic or, as it is more often put, ‘open-ended’.

It is the static conception that is usually regarded as the ‘official’ one in mathematical logic, but Solomon Feferman (1996) has shown that the dynamic conception can be made to do mathematical work. The dynamic conception has also been put to philosophical work by McGee (1997) and to joint philosophical and technical work by me (Heck, 2011, 2018b). It is probably fair to say that the dynamic conception remains controversial. But it is also fair to say, or so it seems to me, that it is actually the more natural of the two. And it is, I think, pretty clearly what the founders of modern logic had in mind.

Moreover, it is the dynamic conception that articulates how a disquotationalist should, and most disquotationalists do, understand the role of the T-scheme. The T-scheme is not supposed to be a static summary of a bunch of principles that apply only to our language as we now have it, so that the introduction of a new expression would give us no reason to accept the new instances of the T-scheme that then arise. On the contrary, disquotationalists understand the T-scheme as a general principle—indeed, as the general principle—that governs the use of the truth-predicate (Field, 1994, p. 266, n. 20). To put the point in terms of

24 Feferman introduces the notion as a ‘more natural’ way of developing ideas which with he has, in one form or another, been concerned throughout his career (Feferman, 1962, 1991). The underlying idea has its roots in early work by Alan Turing (1939) on what he called ordinal logics.
conceptual role semantics, which many disquotationalists seem happy to adopt, the T-scheme summarizes a disposition that competent users of the truth-predicate must have, namely, to infer a sentence from an attribution of truth to that sentence, and conversely. So the T-scheme, as disquotationalists understand it, is ‘open-ended’, generating new instances of itself as the language evolves.\(^{25}\)

Given this understanding of the T-scheme itself as a general principle, it is natural to wonder if there isn’t some way of reasoning with it \textit{as} a general principle so as to establish other general principles from it. Such reasoning is precisely what the schematic argument on behalf of (7) was attempting. As we saw, there are several problems one might have with that reasoning. But something like this reasoning is, in fact, quite common. I’ve come to realize, in fact, that I have sometimes given arguments of the same sort myself.\(^{26}\)

The argument I have in mind is a well-known argument for the claim that the T-scheme fixes the extension of the truth-predicate.\(^{27}\) Here is the argument. Suppose that \(T(x)\) and \(\tau(x)\) both satisfy the T-scheme. Then:

(i) \(T(\langle A \rangle) \equiv A\), since \(T(x)\) satisfies the T-scheme.

(ii) \(\tau(\langle A \rangle) \equiv A\), since \(\tau(x)\) satisfies the T-scheme.

(iii) \(T(\langle A \rangle) \equiv \tau(\langle A \rangle)\), by propositional logic.

Since this holds for any sentence \(A\), \(T(x)\) and \(\tau(x)\) have the same extension (on their common range).

\(^{25}\) Gupta (1993, §5) expresses some doubt about whether disquotationalists can understand the T-scheme as any kind of generalization. I think this is at best a stand-off and so shall not pursue the issue.

\(^{26}\) There’s an even more interesting question in this same vicinity, namely, whether schematic reasoning might help explain what justification we have for regarding all the axioms of \(\text{PA}\) as true. There is no problem about why we regard each of the axioms as true: We accept the axiom, we accept the T-sentence for it, and we make a simple inference. But it is much less obvious with what right we regard all the axioms as true. (Hao Wang (1952, p. 260) credits Barkley Rosser with the realization that this question needs to be asked.) In the context of an axiomatic theory of truth for the language of arithmetic, the proof is by induction, and the instance of induction we need necessarily involves semantic vocabulary. One might wonder if there is a different story to be told, however, along the lines we are discussing.

\(^{27}\) A corollary of this argument is that any predicate that satisfies the T-scheme will be extensionally correct, in the sense that its extension will agree with the ordinary truth-predicate ‘\(\ldots\) is true’ on the sentences to which they both apply. This is because the ordinary truth-predicate itself satisfies the T-scheme.
It’s a nice question how such arguments should be understood. One might suspect that the argument tacitly uses the notion of truth. I would not be unsympathetic. But, dialectically, I doubt this sort of worry will get much traction. The argument just rehearsed does not seem to employ the notion of truth, but to make perfectly good sense in its own right. And Field (2005, §3) offers a detailed account of the sorts of principles that might govern such arguments, principles that suffice, he claims, to allow for proofs of all the compositional principles comprising a full truth-theory for any first-order language. In the case of the schematic argument for (7), the thought is that the various steps of the argument are, as Field puts it, “part of the language”, in perfectly good order as they are. They just contain free schematic variables. And once we have reached the conclusion:

(iv) “A and B” is true iff “A” is true and “B” is true.

we may infer

(v) For all sentences S and T, \( \langle S \text{ and } T \rangle \) is true iff S is true and T is true.

by a principle allowing for the replacement of schematic letters that are everywhere within quotation marks by variables ranging over sentences. The details are a little messy, but not that bad.

For our purposes, the more important point is that Field’s interpretation of such arguments also yields an answer to the question how disquotationalists should understand the expressive role played by the truth-predicate in compositional principles: It functions as a device that allows what is really substitutional quantification to appear as objectual quantification. Indeed, Field (1994, p. 259) suggests that the schematic approach “corresponds to a very weak fragment of a substitutional quantifier language...”. The truth-predicate might then be regarded as just a expressive device that permits substitutional quantification to appear, syntactically, as objectual quantification over sentences. This is a fairly common idea in deflationist writing, so it is no surprise that it should surface here.

The problem, then, is not that ‘schematic reasoning’ cannot be used to establish principles like (7). The problem, as we shall see in the next section, is that this kind of argument works too well.\(^{28}\)

\(^{28}\) A somewhat different worry is that this sort of reasoning works only when the object language is part of the meta-language. We cannot, for example, use schematic reasoning
3 Schematic Reasoning Over-generates

There is another argument that Field might have given for (7):

(i) “A and B” is true iff A and B.

(ii) “A and B” is true iff “A” is true and “B” is true.

(iii) For all sentences S and T,⌜S and T⌝ is true iff S is true and T is true.

The first two steps are justified by the disquotational character of the truth-predicate; the last, by principles governing schematic reasoning.

Once one notices this sort of argument, however, it becomes apparent that it can equally well be used to prove:

(18) For all sentences S and T,⌜S because T⌝ is true iff S is true because T is true.

Thus:

(i) “A because B” is true iff A because B.

(ii) “A because B” is true iff “A” is true because “B” is true.

(iii) For all sentences S and T,⌜S because T⌝ is true iff S is true because T is true.

Here again, the first two steps are justified by the disquotational character of the truth-predicate; the last, by principles governing schematic reasoning.

One might think it obvious that this last argument should fail. Consider the obvious adaptation of the original schematic argument to the case of “because”:

(i) “A because B” is true iff A because B.

(ii) “A” is true iff A.

(iii) “B” is true iff B.

to establish that⌜“A und B”⌝ is true (in German) iff A is true (in German) and B is true (in German). But disquotationalism privileges the homophonic case anyway, so I shall do not pursue the point. Still, this does point to the central role that translation must play in disquotationalism, and that does cause serious problems elsewhere (Heck, 2019).
(iv) "A because B" is true iff "A" is true because "B" is true.

That certainly does fail, since substitution of material equivalents is not permitted inside intensional contexts. But as Field (1994, p. 258) notes, for the disquotationalist, the first three biconditionals all hold "of conceptual necessity... in virtue of the cognitive equivalence of the left and right hand sides". Such a strong equivalence surely does justify the inference made at (iv). And something similar is true of the previous argument for the same conclusion. According to the disquotationalist, the sentences \( \lceil A \rceil \) is true and \A are equivalent in a very strong sense, since the predicate "is true" simply erases the quotes around the sentence \( A \) and then gets out of the way. Substitution of one for the other is therefore permitted globally.

This will no doubt seem odd, but it is a familiar oddity. One might equally well have thought that substitution of \( \lceil A \rceil \) for and by \A itself should not be permitted in modal contexts. But, as we saw earlier (see page 5), it is. So we can also prove a composition principle for necessity:

(19) "Necessarily, A" is true iff, necessarily, "A" is true.

Thus:

(i) "Necessarily, A" is true iff, necessarily, \A.

(ii) "Necessarily, A" is true iff, necessarily, "A" is true.

Indeed, the conclusions of these arguments simply express what Field himself argues is required if "true" is to play the role disquotationists think it plays: \( \lceil A \rceil \) is true must be substitutable for and by \A, even when it occurs in the context of a “because” statement, and even in modal contexts, the reason being, again, that \( \lceil A \rceil \) is true is supposed really to amount to no more than \A itself, if the truth-predicate is read disquotationally.

As mentioned above, it is often useful to compare what happens when we use a disquotational truth-predicate to what happens when we use a propositional one. This claim:

(20) It is true that A because B iff it is true that A because it is true that B.

seems perfectly acceptable. But the disquotationalist intends (18) to be equivalent to (20), though it uses a sentential truth-predicate rather
than a propositional one, so as to avoid the commitment to propositions. If so, then (18) should be as acceptable to a disquotationalist as (20) is to the rest of us.

The same point emerges if one reflects on the fact, mentioned at the end of the last section, that, for a disquotationalist, the truth-predicate is functioning in compositional principles essentially as syntactic sugar sprinkled over an underlying substitutional quantifier. On that interpretation, (7) amounts to

\[ \Pi S \Pi T \Pi U [U = 'S and T' \rightarrow U \equiv (S and T)] \]

and (18) amounts to:

\[ \Pi S \Pi T \Pi U [U = 'S because T' \rightarrow U \equiv (S because T)] \]

There is nothing whatsoever wrong with either of these—other than that they are trivialities, facts not of semantics but of orthography.\(^{29}\)

Field (2005, pp. 23–4) discusses a closely related point in connection with the question whether his schematic treatment extends to belief attributions. The particular question at issue there is whether schematic reasoning can be used to prove:

(21) “S believes that A” is true if and only if S believes that “A” is true.

Field offers various reasons to doubt that (21) can in fact be proven schematically and expresses some doubt about (21) itself. But, for the reasons already given, I find Field’s discussion hard to align with his disquotationalist commitments.\(^{30}\) From a semantic point of view, (21) is extremely dubious. But from the disquotational point of view, surely (21) ought to be correct. It has to be correct if the truth-predicate is to play the expressive role disquotationalists think it plays. Suppose I want to

\^{29}\) Much the same point can be made about Horwich’s attempt to deflate the notion of compositionality (Heck, 2013).

\^{30}\) I am independently puzzled by this remark:

\[ \ldots \text{[In order for (21) to be usable in a full compositional semantics, we’d also need other applications of substitutivity that are likewise dubious; e.g., we’d need that } S \text{ believes that ‘p or q’ is true if and only if } S \text{ believes that ‘} p ‘ \text{ is true or } S \text{ believes that ‘} q ‘ \text{ is true. (Field, 2005, p. 24)}} \]

I’m not sure what Field is thinking here—he doesn’t explain further—and I cannot think of any reason myself that one would need such a principle in a compositional semantics, whether it was based upon (21) or not. In any event, the issue is whether Field is committed to (21), not what work (if any) it might do.
affirm John’s belief in the Euclidean character of space. Then I might say, “John believes that the axioms of Euclidean geometry are all true”. If that is not to be a comment on John’s beliefs about the semantics of English (cf. Field, 1994, pp. 265–6), then “A” is true has to be equivalent to $A$, even inside intensional contexts. So (21) seems to be provable in the usual way:

(i) “$S$ believes that $A$” is true iff $S$ believes that $A$

(ii) “$S$ believes that $A$” is true iff $S$ believes that “$A$” is true

Field (2005, p. 24) also expresses concern that the relevant application of the rule that allows schematic variables to be replaced by objectual ones ranging over sentences might be questionable in this case, since it “seems to depend for its plausibility on the assumption that we can unproblematically quantify into” the appropriate sort of context. But there is nothing wrong with quantifying into intensional contexts. We do it all the time in ordinary language. If ‘quantifying-in’ seems puzzling, it is because of other theoretical commitments we have, not because it is obviously problematic. Specifically, the problems connected with quantifying-in arise because of our commitments regarding the semantics of quantification: because we want to regard the quantified variable as ranging over ordinary objects (people and planets, rather than intensions or modes of presentation).

32 Even more fundamentally, it is because we so much as think of variables as having values that quantifying-in is a problem. If one thought of the truth of a quantified statement in terms of the truth of its instances, then, as Ruth Barcan Marcus (1972) was fond of pointing out, there would be no problem at all.33 Field cannot have...

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31 As I mentioned in note 6, these are not entirely equivalent: The former commits one to the existence of the sentence $A$. But it is not obvious that this commitment has to be the believer’s, as opposed to the attributor’s. To assume it did would be to make strong assumptions about how the content of the complement clause has to be related to the content of the belief attributed.

32 There is someone Superman knows can fly that Lois does not, because Superman knows that Clark Kent can fly, and Lois does not. But there may well not be anyone that Lois knows can fly that Jimmy does not, even though Lois knows that Superman can fly, and Jimmy does not know that Clark can fly.

33 The fact that there are objects without names need not be an obstacle. One can always consider expanded languages, in which new names have been introduced. And one need not consider a single language in which every object has a name. It suffices to consider, for each finite set of objects, a language in which each of them has a name. That makes for rather a lot of languages, but each of them is just a finite extension of the base language.
it both ways. He cannot both suggest that we regard questions about
the semantics of attitude attributions as “misguided” and then invoke
the very problems that motivate such questions when trying to avoid
unwelcome consequences of his own view.

But whatever the status of (21), it should be clear that few of Field’s
worries about it carry over to (18) and (19). There is no obstacle whatso-
ever to quantifying into causal or modal statements. And the sugges-
tion, which we did not discuss, that (21) might fail because S “may have
peculiar beliefs about truth” (Field, 2005, pp. 23–4) has no analogue in
those cases. While my own view, then, is that Field is committed to (21)
as well as to (18) and (19), it is enough for what follows if he is committed
only to the latter two.

4 Truth-functionality

Friends of semantics will have greeted (18) and (19) with bemusement.
But what exactly is supposed to be wrong with them? Why do they
feel so different from (7)? The reason, I take it, is that we tend to read
(7) as expressing the truth-functionality of conjunction, in which case
(18) should affirm the truth-functionality of “because”, contrary to fact.
But if (18) is true when the truth-predicate is read disquotationally,
then obviously it cannot (so read) be affirming the truth-functionality of
“because”. By parity of reasoning, then, (7), read disquotationally, cannot
affirm the truth-functionality of “and”, either.

It follows that the sorts of arguments we have been examining do not
allow the disquotationalist to prove the compositional principles in the
sense that friends of semantics understand them. In particular, this sort
of reasoning cannot be used to demonstrate the truth-functionality of
conjunction, which I take to be one of the central semantic facts about it.
Assuming, of course, that it is a fact about it. Strawson (1952, pp. 79–82)
famously denied that “and” is truth-functional, on the ground that there
is a temporal aspect to its meaning. A sentence like

(22) They got married, and they had a baby.

could be true, Strawson claimed, even though

(23) They had a baby, and they got married.

34 These are intensional but not, as it is said, hyperintensional, and the really serious
problems arise in the latter case.
was false. But how this issue is decided has no effect whatsoever on whether (7) is true when the truth-predicate is read disquotationally. If truth is disquotationald, then \( \text{⌜"A" is true and "B" is true⌝} \) just means what \( \text{⌜A and B⌝} \) means which is just what \( \text{⌜"A and B" is true⌝} \) means, and that is the end of it, no matter what “and” actually means. If that were not so, then the truth-predicate could not be used, in the context of a conjunction, for the expressive purposes for which the disquotationalist thinks we need it.

I am assuming, of course, that the question whether “and” is truth-functional is an important semantic issue, and that it should affect the form of the compositional principle we accept for it. Foes of semantics might not agree, but my goal here is not to convince them of the virtues of semantics. My goal is to argue that the notion of truth, as it appears in semantics, is not playing the merely expressive role that a disquotational truth-predicate plays: One cannot understand the use of the truth-predicate, in semantics, as purely disquotationald, as just a tool of ‘semantic ascent’. Rather, the notion of truth is doing serious theoretical work, and that work is nowhere more visible than in disputes over truth-functionality. The fact that “and” is truth-functional (if, again, it is one) is supposed to explain certain aspects of the behavior of that word, and the fact that “because” is not truth-functional is supposed to explain some of the ways in which it is unlike “and”. So truth has a robust, explanatory role to play in semantics.

A disquotationalist might respond that truth-functionality is, to be sure, an important phenomenon, but that it is not a semantic but a logical phenomenon, one that has to do with what sorts of inferences are valid, not with whether (7) is true. Presumably, the inferences in question would be something like:

(i) \( \text{A and B} \)

(ii) \( \text{B if, and only if, C} \)

(iii) \( \text{Hence, A and C} \)

Call these ‘inferences constitutive of truth-functionality’.

Even at first sight, one ought to be suspicious of this sort of inferential characterization of truth-functionality. If the biconditional is not itself truth-functional, then it may license such substitutions in cases where the connective under discussion is not truth-functional.\(^{35}\) For example,
if the biconditional expresses strict equivalence, then it will license substitutions inside modal contexts.\(^{36}\) It is rarely held nowadays that the natural language conditional is truth-functional, so this sort of inference, formulated in natural language, almost certainly does not capture truth-functionality. But, even if we set that worry aside, the offered condition is easily seen to be both too weak and too strong.

To see that the condition is too weak, consider the conditional itself. Then the inference in question takes the form:

(i) If \(A\), then \(B\).

(ii) \(B\) if, and only if, \(C\).

(iii) Hence, if \(A\), then \(C\).

This will be valid so long as the conditional is transitive, whether or not it is truth-functional, and the same goes for the case in which we substitute in the antecedent. The inferential conception would thus count any transitive conditional as truth-functional.

One might suggest, in response, that the inference should not be stated in terms of “if and only if”, but in some other terms. One idea, for example, would be to take the second premise to be:\(^{37}\)

(ii\(^{'}\)) Either \(B\) and \(C\), or it is not the case that \(B\) and it is not the case that \(C\).

which is disquotationally equivalent to:

(ii\(^{''}\)) Either “\(B\)” is true and “\(C\)” is true, or “\(B\)” is false and “\(C\)” is false.

But this proposal has similar flaws. As mentioned earlier, it is controversial whether “and” is truth-functional. If it is not, then (ii\(^{'}\)) is not truth-functional, either, and the possibility will again arise that it will support inferences it should not.

\(^{36}\) And, of course, the English phrase “if, and only if” may have different readings in different occurrences, which will complicate matters further.

\(^{37}\) Another idea would be to introduce some technical notion in terms of which to state the inference, a notion that would presumably be explained by stipulating the validity of certain inferences in which it participates. But for the sorts of reasons mentioned in note 35, I doubt this will suffice.
But however the inference is formulated, requiring it to be valid if a connective is to be truth-functional is too strong a condition. I have mentioned several times now that it is controversial whether “and” is truth-functional. That question is not, however, decided simply by considering the truth-values of such sentences as (22) and (23). Even if those two sentences can have different truth-values, it does not follow that “and” is not truth-functional. The reason for the difference in truth-value might lie not in the meaning of “and” but in the interaction of the tenses on the verbs with each other and with other elements of the syntactic structure of the sentence. Such an account was developed by Barbara Partee (1984, §IV) in the context of Discourse Representation Theory, and similar accounts can be developed in other frameworks, as well (see e.g. King and Stanley, 2004, §V).

Ultimately, of course, it is an empirical question what accounts for the temporal reading of conjunctions; that is, it is an empirical question whether “and” is truth-functional. But the point here is conceptual: One cannot read off from the truth-values of sentences in which “and” occurs whether it is truth-functional. There is too much else going on in such sentences for such an inference to be legitimate. If so, however, no inferential test of the sort we are considering can work. Truth-functionality just ain’t a matter of inference.38

One might respond that, if Partee is right, then (22) and (23) aren’t, on the readings in question, actually conjunctions. They have some more complex structure. So, if we consider sentences that really are conjunctions, then the inferential test will work. But then the question is how we are supposed to tell which sentences ‘really are’ conjunctions. The point is not just that it is hard to know. The point is that, in practice, claims about what the structure of a sentence ‘really is’ are evaluated by considering how its having a given structure would affect its meaning. One can’t even discuss this sort of question unless one has some sort of idea how structure-facts affect meaning-facts.39 And how structure affects meaning is what semantics is about—one of the things it is about,

38 Note that the same point disposes of the suggestion that a connective * is truth functional just in case whether $A * B$ is completely determined by whether $A$ and whether $B$. Even if whether they got married and whether they had a baby does not completely determine whether they had a baby and they got married, it could yet be that “and” is truth-functional.

39 This is true even in simple cases like: He saw John in the mirror. The usual claim is that “He” cannot be bound to “John”. But that claim makes little sense absent the background assumption that facts about binding imply facts about meaning, in this case, that such binding implies de jure co-reference.
anyway. So the question whether (22) and (23) are ‘really conjunctions’ is one that makes no clear sense outside the semantic project.

This sort of point is perhaps easiest to understand in connection with quantification. Consider, for example:

(24) Most professors know a student who hates every class.

There are a few possible readings for this sentence, but it seems to me that (24) cannot mean that every class is hated by some student that most professors know. Why not? The familiar answer is that, while the three quantifiers in (24) can take different scopes, not every possible ordering of the scopes is available. And surely that must be right. But it is only a partial explanation, and it would be no explanation at all if we did not understand how scope affects meaning: (24) has the readings it does, and not others, because certain scope relationships are possible, and a sentence in which the quantifiers take these scopes has this meaning; one in which they take those scopes has that meaning; and to get this other (unavailable) meaning, the quantifiers would have to take these other scopes which, for some reason, they can’t.

As we’ll see in section 7, the history of quantification theory illustrates this sort of point nicely. It’s one thing to understand that different sorts of structures are available in the case of a sentence like (24). It’s quite another thing to understand how a sentence’s having a certain structure makes a certain meaning available for it.

5 Schematic Reasoning and Compositional Principles

Toward the end of his paper on schematic reasoning, Field makes two suggestions:

First, it may simply be misguided to look for compositional truth or meaning principles for attitude constructions. Sec-

\(^{40}\) Whereas it can mean, I think, that every class is such that most professors know a student who hates it.

\(^{41}\) Variable-free semantic theories would explain the phenomenon differently. But the remarks to follow also apply to them. Perhaps even more so, since syntax does so little work in such frameworks.

\(^{42}\) Field (2005, p. 21) conjectures that schematic reasoning can be used to prove compositional principles about meaning, as well as about truth. I suspect he is right, but in that case the vacuity of the resulting claims is even more obvious than it is in the case we are discussing here (Heck, 2013).
ond..., the fact that compositional principles of truth or meaning are straightforward for some constructions but not others is not fundamentally a fact about the application of the notion of truth or meaning to different constructions, but is simply a fact about the underlying logic of those constructions. Facts about the logic of these constructions explain the facts about how the notions of truth and meaning that apply to them, rather than the other way around. (Field, 2005, p. 24)

The logic of “and” and “or” permits a simple derivation of the compositional principles for them, but the logic of attitude constructions, Field thinks, does not. Now, as I have said, if the truth-predicate is disquotational, then that is wrong. But set that aside. Suppose we accept, as almost anyone would,43 that $A$ and “$A$ is true” are materially equivalent. Then it looks as if schematic reasoning will permit the derivation of the compositional principle for “and” (though it will not then permit the derivation of the compositional principles for “because” and “necessarily”). That is, it looks as if (7) will be provable by schematic reasoning, just given the very weak assumption just mentioned. How then can (7) be regarded, as friends of semantics want to regard it, as an empirical hypothesis?

I do not mean to attribute this line of thought to Field, but it is naturally suggested by his paper, and it took me a while to formulate an answer to it. So it seems worth considering, at least briefly.

To see the response, consider:

(25) “Alex swims and Tony runs” is true iff Alex swims and Tony runs.

Friends of semantics would regard (25) as one of the empirical claims in whose explanation (7) figures. But (25) is just an instance of the T-scheme. How can it need explaining at all? There seems to be a way of knowing that (25) is true that simply involves reflecting on the meaning of the word “true”. But even if (25) can, in this way, be known by reflection, or even a priori, it does not follow that (25) is not empirical, nor that it does not stand in need of explanation. I can know a priori that I am here now, but it is an empirical fact nonetheless, and one that can be explained.

Moreover, my own view is that the full story about how one might come to know (25) on the basis of reflection is significantly more complicated than: ‘true’ disquotes (Heck, 2004, §5). The complications matter.43

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43 Modulo concerns about the paradoxes, of course, though those will affect this entire discussion and so may be set aside for the moment.
In particular, one cannot come to know (25) by this sort of reflection unless one already understands the embedded sentence “Alex swims and Tony runs”. That understanding, on my view, partially consists in knowledge of (25). That need not make the reflective knowledge circular. It just means that, once one has come to know (25) in one way—by learning to speak the fragment of English of which it is a part—and one has also come to understand the word “true”, then another, more ‘reflective’ way to know (25) also becomes available (Heck, 2004, 44 45).

Something similar is true of compositional principles. The semantical view is that principles like (7) are more fundamental than such T-sentences as (25): Part of the reason (25) is true is because a conjunction is true just in case both its conjuncts are, but it is no part of why (7) is true that (25) is true.44 It is no threat to this position if, once such T-sentences are in place, one can do ‘reverse semantics’ and derive the more fundamental compositional principle for conjunction from the less fundamental T-sentences it partly explains by reflecting on the pattern exhibited by such T-sentences generally.

It is no doubt an interesting question why such schematic derivations seem to be available in some cases but not in others. But there is an obvious sense in which Field’s schematic arguments simply piggyback on genuine semantics: Field introduces deflated versions of whatever machinery is required by genuine semantics and then treats it schematically. I suspect that such mimicry is also possible in other sorts of cases. The difference is simply that, in those other cases, more sophisticated sorts of semantic machinery will be involved. In many cases, there is simply, as yet, no semantic theory to mimic.

6 A Brief History of Truth-Functionality

I argued in section 4 that truth-functionality cannot be characterized in terms of the validity of inferences. It is, rather, a semantic phenomenon, one that can only be characterized in terms of the notion of truth, which thus plays a role in semantics that is not simply expressive. The history of the notion of truth-functionality teaches us the same lesson.

Common wisdom seems to have it that the notion of truth-functionality is due to George Boole, but that is incorrect. Boole does think of (what we

44 Indeed, (7) could be true even if (25) was not true: “Alex swims and Tony runs” might be an idiom.

45 There is a program in the foundations of mathematics known as ‘reverse mathematics’ (Simpson, 2009). It is sometimes said to involve deriving axioms from theorems.
would call) sentence-letters as having ‘values’, and he thinks of conjunction and the like as corresponding to operations on those values, with the values and the operations together forming (what we now call) a Boolean algebra. So Boole does think of conjunction as a function. But he does not think of it as a truth-function, because he does not think of the values of sentence-letters as truth-values. They are, rather, classes, subsets of the ‘universe of discourse’, which he originally regards, in The Mathematical Analysis of Logic, as comprised of ‘cases’ or ‘circumstances’: The value of a sentence-letter is the set of circumstances in which it is true (Boole, 1847, pp. 48ff).

By The Laws of Thought, Boole had become dissatisfied with this view, because it requires “a definition of what is meant by a ‘case’”, which he thinks will involve us in matters beyond the bounds of logic (Boole, 1854, ch. XI, §16). In this later book, then, he regards the universe of discourse as consisting of times, and the value of a sentence-letter becomes the set of the times at which it is true. Other Booleans made yet other choices. But almost all the Booleans take the values of sentence-letters to be subsets of some universe of discourse. The crucial advantage of this view, from their point of view, is that hypothetical judgements can thereby be unmasked as universal affirmative propositions, relations between classes:

Let us take, as an instance for examination, the conditional proposition “If the proposition $X$ is true, the proposition $Y$ is true”. An undoubted meaning of this proposition is, that the time in which the proposition $X$ is true, is time in which the proposition $Y$ is true. (Boole, 1854, ch. XI, §5)

More generally, the ‘calculus of judgements’, sentential logic, can thereby be reduced to the ‘calculus of classes’—Aristotelian logic, more or less—thus unifying what might otherwise have looked like unrelated parts of logic (Heck and May, 2018, §3).

The question what comprises the universe of discourse has proved not to be the crucial point. Boole’s great insight was precisely that, no matter what we take the universe to comprise, if we treat the sentential connectives as expressing set-theoretic operations on its power set, then the algebra so determined will validate the laws of classical logic. And

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46 Ernst Schröder (1972, p. 224) expresses this sort of view in his review of Frege’s Begriffsschrift (Frege, 1967). Hugh MacColl (1877, pp. 9–10) comes closest to the modern conception, but his official view is that the sentence-letters denote ‘statements’.
the flexibility inherent in Boole's approach has proven a great advantage. His original view, that the universe comprises 'cases', inspired some of the earliest work on modal logic. His later view, that it comprises times, had a similar influence on tense logic.

Boole does pay special attention to the case in which the universe contains just one element. Then we have a two-element Boolean algebra, with elements Boole would have denoted 1 and 0. But Boole does not interpret 1 and 0 as truth and falsity: They denote the universe and the empty set, as they always do in his work. Boole regards this case as especially important because it makes the calculations in which he is interested especially easy. But—and this is the point—none of this affects Boole's theory of those calculations, that is, his attempt to axiomatize the structure of a Boolean algebra, that is, his attempt to formalize sentential logic. What I earlier called 'inferences constitutive of truth-functionality' were well-known to Boole. Identity, which functions like the biconditional, features prominently in his calculations, as do the substitutions that it licenses. But the notion of truth-functionality simply is not present, because Boole does not, as we have seen, think in terms of truth and falsity.

The notion of truth-functionality is not present in Frege’s *Begriffsschrift*, either, though Frege does there present a complete formalization of sentential logic, and ‘inferences constitutive of truth-functionality’ are frequently made. Indeed, one of the rules governing the sign for ‘identity of content’, which acts much like the biconditional (and is written: \( \equiv \)), is proposition (52), which is a form of Leibniz’s Law and which permits precisely the substitutions embodied in the ‘inferences constitutive of truth-functionality’.

The striking fact, though, is that, in *Begriffsschrift*, Frege simply does not explain the conditional in terms of truth and falsity. His explanation reads, rather, as follows: Frege himself would eventually come to realize that the language of affirmation and
If $A$ and $B$ stand for contents that can become judgements..., there are the following four possibilities:

1. $A$ is affirmed and $B$ is affirmed;
2. $A$ is affirmed and $B$ is denied;
3. $A$ is denied and $B$ is affirmed;
4. $A$ is denied and $B$ is denied.

Now

\[
\begin{array}{c}
A \\
\hline \\
B
\end{array}
\]

stands for the judgement that the third of these possibilities does not take place, but one of the other three does. (Frege, 1967, §5, emphasis removed)

Frege does not actually think of the conditional as expressing a function at all in *Begriffsschrift*. He seems to get that idea a few years later, from Boole (Heck and May, 2018, §3). The idea that the conditional expresses a *truth*-function, however, is Frege's own, and it does not appear until 1891, in his lecture *Function and Concept* (Frege, 1984b, opp. 20ff). The crucial innovation Frege has made at that point is to introduce the notion of a truth-value—and with it the idea that sentences denote their truth-values. Then the way is open to regarding the conditional as, quite literally, expressing a truth-function: a function whose arguments and values are truth-values.\(^{50}\)

The notion of truth-functionality did not emerge, then, either from the algebraic manipulations we find in Boole nor from the codification of inference presented in *Begriffsschrift*. Though these earlier efforts no doubt help prepare the way, truth-functionality appears only within, and as a central part of, the semantic perspective that Frege embraces in his later writings.

\(^{50}\) There is of course a complication in the fact that Frege regards the truth-values themselves as being objects among the other objects, so the arguments of the conditional include other objects besides the truth-values, such as 2 and the null class. But, in practice, we can regard the conditional as a truth-function, because of how the ‘horizontal’ works, and Frege himself tends to treat it that way.
I would suggest, in fact, not only that truth-functionality cannot be explained in terms of inference, but that even compositional principles like (7) do not really capture it. Properly to capture it, we need to follow Frege and think of sentences as having ‘semantic values’ and of connectives like “and” as operating on those values. That, in fact, is often how things are done in developed presentations of truth-theoretic semantics for natural languages (e.g., Larson and Segal, 1995). The possible semantic values for sentences, truth and falsity, form a two element Boolean algebra, and the semantic values of conjunction, disjunction, and the like are the operations of that algebra. In such a treatment, it is not just the particular clause for conjunction that expresses its truth-functionality, but the semantic framework in which that clause is stated. Semantic notions then play an even more fundamental role than they do if the theory is formulated simply using compositional principles.

7 Quantification

To this point, we have mostly been considering compositional principles for sentential connectives that are plausibly truth-functional. We have seen that the tools Field and other deflationists have provided for deriving such principles work too well. This reveals that what disquotationalists are able to prove—e.g., (7), in its disquotational reading—is simply not the same principle that plays an important role in (a certain sort of) semantic theory. Moreover, truth plays a role not only in the formulation of compositional principles, but in the statement of more general principles like truth-functionality. And that role is not one that disquotationalists can acknowledge.

These same sorts of issues arise with respect to quantification.

Field (2005, §5) argues that schematic reasoning can also be used to derive disquotational versions of such principles as Tarski’s clause for the existential quantifier. But the principle Field derives is no more the one Tarski stated than the schematic version of the clause for conjunction is Tarski’s clause for conjunction. There is nothing in the sort of schematic argument that Field gives that requires the open formula into which we are quantifying to be extensional. This is unsurprising since, as was said above, the expressive role the truth-predicate plays in

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\[51\] This point is argued in detail by Dummett in the early chapters of The Logical Basis of Metaphysics. He expresses it by saying that a “meaning-theory must...incorporate a semantic theory” (Dummett, 1991, p. 63).
compositional principles, according to the disquotationalist, is that of a
substitutional quantifier, and you can quantify, substitutionally, into any
context without difficulty. This leads to a question about the “objects”
that Field takes “assignment functions” to pair with variables. What
are these objects? Field appears just to assume that they are ordinary,
everyday objects. But if we make that assumption, then the uniform
schematic treatment no longer works, unless we have some reason to set
152–7).

The more important point, however, is the one made earlier: The
usual reason to regard quantification into intensional contexts with
suspicion is bound up with common, but nonetheless substantial, as-
sumptions about the semantics of quantification. This point emerges
with particular clarity if one reflects on the dispute between Marcus
(1961) and Quine (1961) over quantification into modal contexts and, in
particular, on Marcus’s emphasis on the role played by ‘extensionalizing
principles’. Indeed, I would have thought that the obvious way for a
disquotationalist to think of the truth of a quantified formula was in
terms of the truth of its instances, not in terms of assignments. To think
of variables as having values, and of the truth of a quantified formula in
terms of satisfaction, is already to think semantically.

Moreover, just as the truth-functionality of “and” fails to be captured
by the disquotational reading of (7), so there are general claims about
the semantics of quantification that no schematic derivation can yield.
It is generally accepted nowadays that natural language quantifiers are,
in some appropriate sense, ‘binary’, so that (roughly speaking) one forms
a sentence from two open formulae—the appropriate form is something
like $Qx(Fx \land Gx)$—not from just one, as in familiar presentations of first-
order logic. That, of course, is just a matter of syntax. The fruitful
semantic idea is that quantifiers in natural language express certain sorts
of comparisons between the extensions of the two formulae involved. And
there are important hypotheses about what these comparisons must be

\footnotesize{$^{52}$ Marcus goes so far as to deny, in the discussion that followed her exchange with
Quine, that, in the strictest sense, nine is the number of planets (Marcus et al., 1962, p.
136).

$^{53}$ In fact, a more common approach nowadays is to regard quantifier words, like ‘some’
and ‘most’, as combining with a noun phrase to form a determiner phrase, so that the
appropriate logical form is more like: $(Qx : Fx)(Gx)$. But the discussion here does not
turn upon such issues. For the details, see any decent textbook on semantics (e.g., Heim
and Kratzer, 1998).}
like. John Barwise and Robin Cooper (1981) noticed, for example, that natural language quantifiers are 'conservative', in the sense that the following are equivalent:

\[ Q_x(Fx; Gx) \]
\[ Q_x(Fx; Fx \land Gx) \]

Thus, every girl is smart iff every girl is a smart girl; most boys are funny iff most boys are funny boys; and so forth. This suggests, in turn, that the first component of the quantifier serves to restrict the domain of the second, so that the comparison is not between the extension of \( Fx \) and that of \( Gx \), but between the extension of \( Fx \) and that of \( Fx \land Gx \).

A yet further suggestion is that the comparison between these must always concern cardinality, something that would follow from the more general claim that the truth of a quantified sentence is always insensitive to permutations of the domain (see e.g. Sher, 1991).

Of course, the proper formulation of these various generalizations remains a matter of dispute, and my own formulations are not only vague but probably out of date. The point is simply that, except for conservativity, these sorts of generalizations, which figure prominently in actual work on quantification in natural language, essentially involve the notion of truth and related semantic concepts, such as that of the extension of a formula. One might propose that these generalizations should be reconceived in terms of the acceptability of certain inferences. But this does not seem very plausible. It is not at all clear to me how one might formulate the corresponding inference in the case of the generalization concerning cardinality. It would presumably have to involve complex inferences involving equinumerosity. In the case of the generalization involving permutations, it would involve really complex inferences involving one-one functions on the universe. Neither seems to be within the ken of everyone who understands such constructions, and yet (or so the hypothesis is) everyone’s use accords with such generalizations. That wants explaining.\(^{54}\)

The deeper point is that it is an important question \textit{why} such inferences are, in general, valid.\(^{55}\) This question is not to be compared to the

\(^{54}\) This is not unrelated to the fact that there seems to be no reasonable inferentialist treatment of generalized quantifiers like “most”.

\(^{55}\) The same question might be raised about inferences related to truth-functionality, but the distinction I am about to make is harder to maintain in that case.
question why conjunction elimination is valid.\textsuperscript{56} Conservativity purports to be a general fact about natural language determiners. It entails, for example, that there cannot be (even, could not be) a natural language determiner “Quap” such that “Quap Fs are G” is true just in case there are fewer Fs than Gs: “There are fewer Fs than Gs” does not imply “There are fewer Fs than there are Fs that are G”, because the latter can never be true.\textsuperscript{57} The obvious question is then why there cannot be such a determiner, and it is hard to imagine what the answer could be if it did not involve general principles concerning the semantics of such words. In Barwise and Cooper (1981, §4.4), for example, conservativity is derived from what they call the “Determiner Universal”, which states a general, and purportedly universal (in the sense of universal grammar), condition on the semantics of determiners. And Barwise and Cooper suggest several other such constraints, as well, almost all of which are semantic.

The history of quantification is instructive here, as well. It is often said that Frege introduced the notion of quantification in \textit{Begriffsschrift}, but this is misleading. Frege does use notation in \textit{Begriffsschrift} that is trivially inter-translatable with modern quantifier-variable notation, and his formal theory in \textit{Begriffsschrift} is all but equivalent to a modern axiomatic presentation of second-order logic, with its first-order fragment being sound and complete. The \textit{syntax} of what we now call quantifiers is thus made reasonably clear in \textit{Begriffsschrift}.

Nonetheless, there are no quantifiers in \textit{Begriffsschrift}. What corresponds to our universal quantifier is what Frege calls the “concavity”, but he does not think of it as expressing universal generality. Its purpose, rather, is simply to “delimit[] the scope that the generality indicated by the letter covers” (Frege, 1967, §11, my emphasis). What expresses generality is thus not the quantifier but the “letter”, that is, the variable.\textsuperscript{58} The concavity has no meaning at all, but is pure syntax. In the

\textsuperscript{56} It is perhaps worth saying explicitly that nothing in this paper is meant to address this issue. The issue here has not been how we are to explain the concept of conjunction, but only how we should think about the semantics of “and”. It is one of the many disadvantages of disquotationalism that it essentially deprives us of this very distinction.

\textsuperscript{57} Similarly, conservativity implies, perhaps surprisingly, that “only” is not a quantifier: “Only Fs are F’s that are G” is trivial and so cannot be equivalent to “Only Fs are G”.

\textsuperscript{58} Frege makes this clear at the beginning of the book:

I... divide all signs that I use into those by which we may understand different objects and those that have a completely determinate meaning. The former are letters and they will serve chiefly to express generality. (Frege, 1967, §1)
strict sense, then, there could not have been an existential quantifier in *Begriffsschrift*. That is not to deny, of course, that Frege could have defined an abbreviation for $\neg\forall x \neg$, which is his version of $\neg\forall x \neg$, if he had wished to do so. But he could not have treated the existential quantifier as primitive and defined the universal as an abbreviation. Generality is expressed by the variable, and that generality is always universal.\(^{59}\)

It is not until the 1890s, by which time Frege had fully embraced the semantic perspective, that quantifiers really appear in his work. Now he regards “$\phi(a)$” as referring to a ‘second-level concept’—the letter $\phi$ here is marking the argument place—a higher-order concept that is true or false of first-order concepts and that is, specifically, true only of those concepts under which all objects fall (Frege, 2013, v. I, §8). Though Frege continues to treat the universal quantifier as primitive, and the existential as defined, this is now a matter of convenience, not of principle. Generality, then, is no longer expressed by the variable. The purpose of bound variables becomes purely syntactic, as the concavity’s was before: They help indicate which concept is the argument to the quantifier by marking the argument-places of the complex predicate that occurs in the quantifier’s own argument-place.\(^{60}\) This new account also yields an answer to perhaps the most pressing semantic issue concerning quantification: What is the significance of scope? Relative scope turns out, on Frege’s account, to be a matter of the order in which certain functions are applied: The difference between “$\forall x \exists y (Rxy)$” and “$\exists y \forall x (Rxy)$” turns out to be not unlike the difference between “$f(g(x))$” and “$g(f(x))$”.

8 Closing

Donald Davidson (1984) famously takes the task of semantic theory to be the construction of a compositional theory of truth that delivers such

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\(^{59}\) The costs of this way of thinking are especially visible in Russell’s discussion of variables in the *Principles* (Russell, 1903, ch. VIII). Russell regards such phrases as “a man”, “every man”, and “some man” as each denoting a man, just not any particular man. This aspect of Russell’s view changes in “On Denoting” (Russell, 1905), which opens with a general discussion of how ‘denoting phrases’ should be understood—not as names of different kinds of variables—and then continues with a discussion of why descriptions should be treated similarly. It seems not to be widely appreciated how important this change in Russell’s view of quantification was.

\(^{60}\) See Frege’s explanation of what he calls the “corresponding function” (Frege, 2013, v. I, §8).
theorems as:

(26) “Snow is white” is true iff snow is white.

Ironically, though, given how frequently (26) is used to illustrate the goals of semantic theory, we do not actually know how to formulate a theory that will generate it without getting a great deal else wrong. That is, we do not have a (widely accepted) semantics for mass terms. Field (1994, p. 269) thinks there may well be none to be had and so that it is a virtue of disquotationalism that it relieves us of the need to look for one. And Field (2005, p. 24) would further deny that any explanation of the truth of (26), of the sort semantic theory purports to provide, is required, going so far as to suggest that “it may simply be misguided to look for compositional truth or meaning principles” in such cases. After all, if disquotationalism is true, then (26) is just a verbose way of writing:

(27) Snow is white iff snow is white.

And no deep explanation is needed of (27). So, ultimately, it seems unsurprising that disquotationalism cannot make good sense of such compositional principles as (7), or of semantic theory more generally.

It is of course open to a disquotationalist simply to insist that the use that semantic theory makes of the concept of truth, since it is not ‘merely expressive’, is illegitimate. And it is not my purpose here to convince anyone of the interest of natural language semantics, nor of linguistic theory more generally. My goal has simply been to force a choice between conceptual disquotationalism and semantics by showing that the work that the notion of truth does in semantic theory cannot be regarded as ‘merely expressive’, even in the simplest cases. As it happens, my own view is that the insights gained over the last few decades more than suffice to demonstrate the fruitfulness of the semantic enterprise and of the central role that the thesis of compositionality has played in shaping it. The fact that we have no a priori guarantee that there are compositional principles to be found is simply a reflection of the fact that the compositionality of natural language is an empirical hypothesis, and a strong one (which is part of why it has proven so fruitful). Quite generally, though, the difficulty of formulating a semantic theory for mass terms, or attitude constructions, or generics, or what have you, should be no more surprising than is the difficulty of formulating conditions on the use of resultatives, in syntax, or on vowel reduction, in phonology.
I choose, then, to embrace natural language semantics and to reject conceptual disquotationalism. But I have not argued for that choice here.\textsuperscript{61}

References


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