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Reply to Fine on *Aboutness*

Stephen Yablo[1]

Abstract A reply to Fine's critique of *Aboutness*. Fine contrasts two notions of truthmaker, and more generally two notions of "state." One is algebraic; states are sui generis entities grasped primarily through the conditions they satisfy. The other uses set theory; states are sets of worlds, or, perhaps, collections of such sets. I try to defend the second notion and question some seeming advantages of the first.

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I was going to say that these are the best comments ever written, to my knowledge. But a certain 1975 review of *Counterfactuals* (Fine 1975) was pretty good, I recall. That review's Nixon-pushing-the-button example was an early glimmering of truthmaker semantics, the theme also of much of Fine's review of *Aboutness*.[1] So now I don't know what to say. Maybe, these are the equal-best comments ever written from the perspective of truthmaker semantics (though the earlier claim contains much truth as well).

Fine makes a great many excellent points about the *Aboutness* theory. I would not be surprised if they numbered over a hundred and I toyed with the idea of listing them for you one by one. He understands the theory so infernally well that the interests of inquiry might be better served if I would just step aside. But that would be boring and unresponsive; so I will try something different. Fine's points divide, for present purposes, into five classes:

[1] Yablo (2014).

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(1) those I can take on board without undue violence to the *Aboutness* theory,
(2) those I cannot take on board and that favor Fine's view,
(3) those that are too far-reaching for me to properly assess just yet,
(4) those that reflect, perhaps, a difference in our projects, and
(5) those where I might still have a leg to stand on.

I will focus on the first, fourth, and fifth categories, though the other two—can't take on board, and too far-reaching—are probably larger; and some of what I have put in the fifth may really belong in the third. This means that a great deal will go un- or underdiscussed, particularly the proposals toward the end about partial truth and remainders.

The two of us agree, it bears repeating, about nearly everything. We both want to restore subject matter to its rightful place in the theory of meaning. A sentence's subject matter pertains, for both of us, to what a sentence *says* about certain objects more than the objects themselves. Both of us link subject matter to a sentence's ways of obtaining or failing to obtain. *S*'s ways of obtaining, sometimes called its verifiers or truthmakers, both suffice for *S*'s truth and account for its truth. A fact accounts for *S*'s truth only if it is "proportional" to *S*; verifiers are wholly relevant to what they verify and free of unneeded extras. (Fine speaks here of exact verification.) Proportionality does not require minimality for either of us, though I at least sometimes talk this way.. Both of us see in truthmakers—a better term might be "true-ways," pronounced like "throughways"—the key to a wide range of phenomena: propositional content, same-saying, partial truth (truth about such and such), incremental content, hyperintensionality, and verisimilitude, to name a few.

1 States and worlds

One striking difference between us that I stay within with the possible worlds framework, while Fine rejects that framework in favor of "state space semantics," which assigns to states of affairs (or situations) the role that others assign to worlds. There may be less here than meets the eye. I hadn't *heard* of state spaces when the project got going. Worlds were standard equipment and seemed for the most part not to be getting in the way. One *could*, I suppose, try to turn the "standard equipment" point into an argument for sticking with worlds, as Lewis does in defense of a different orthodoxy:

> I have no [conclusive] objection to the hypothesis that indicative conditionals are non-truth-valued... I have an inconclusive objection, however: the hypothesis requires too much of a fresh start. It burdens us with too much work to be done, and wastes too much that has been done already (Lewis 1976).

But I do not object even inconclusively to the use of states, even super-fine-grained states. I employ them myself in Chapter 4, taking inspiration, as Fine does,

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from Van Fraassen (1969).[2] The difference is that states for me are constructed, or constructible, out of worlds. Is this a difference in position, or theoretical toolkit? The first, if we are doing metaphysics. But *Aboutness* is for the most part an exercise in semantics; and semantics uses whatever devices it can lay its hands on. That state spaces serve us well in many cases does not make worlds an obstacle to progress per se. Fine probably does not disagree with this; they are an obstacle to progress because of specific features not shared with states. But the issue is really between two kinds of state, one deriving from worlds and one not.

Worlds might alternatively be rejected as a *distraction*. But that does not seem to be Fine's position; rather than rejecting worlds he makes them into a special sort of state. Fine follows in this respect a time-honored tradition. Worlds are a special sort of *possibility* for possibility-theorists.[3] They are a special sort of situation for situation semanticists.[4] They are highly opinionated stories for certain fictionalists. Davidsonians may for all I know consider them a special sort of event.

There is a question of theoretical priority. "Worlds are just special *X*s" is the claim of someone who wants to put *X*s at the centre of things. Somehow the idea of putting states (facts, situations,...) there has never really caught on. Semanticists continue on the whole to work with worlds, reaching for partial circumstances as needed. (They are likelier, to go by the voting-with-their-feet test, to see the *non*-worldly situations as a distraction.) I am inclined to follow the practice of semanticists, sticking with worlds where they don't make a mess of things. Fine of course thinks that they *very frequently* make a mess of things.

Anyway there is a reason people are apt to feel on safer ground with worlds. The question always arises with subtler alternatives, in what does their partiality consist? Are situations spatiotemporally limited in the manner of events, logically limited in the manner of pieces of information, or both, in the manner of facts?[5] There are questions on the truthbearer side as well. How much is a situation supposed to settle, and how much is meant to stay settled when the situation is expanded? (This is the question of monotonicity or persistence.) The questions aren't unanswerable, but they are answered differently in different settings, which gives the semantics a technical feel. Worlds are not so schematic; we have a better idea of where we stand.

2 Modality

That states of *some* sort can be made out of worlds is not in question; just take the set of worlds where the state supposedly obtains. World-ish states seem too coarse-grained, however, to do the work that needs doing. Fine puts the worry like this:

2FL01 [2] van Fraassen was dividing his time in those days between Los Angeles and Toronto, where Kit and I
2FL02 respectively lived. *Surely* this is how (we both knew him) we got the idea of fact semantics. But, Kit had
2FL03 already had the idea, and Bas was teaching me about truth-tables.

3FL01 [3] Humberstone (1981).

4FL01 [4] Kratzer (2010).

5FL01 [5] Kratzer (2002).

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> [if states—the candidate verifiers and falsifiers—are non-empty sets of possible worlds, [then] they are subject to two modal requirements:...
>
> *Possibility* Each state possibly obtains.
> *Intensionality* States which necessarily co-obtain are identical.

AQ2

> I do not insist on either requirement. Thus a state may be impossible and states which necessarily co-obtain may not be identical. In particular, there may be many impossible states, ones which cannot obtain, and many necessary states, ones which must obtain. (p??)

Let's focus on *Intensionality* which is problem enough:

> surely we will want, in general, that the proposition $P\&Q$ should contain P. (As Yablo himself writes, "A paradigm of inclusion ...is the relation that simple conjunctions bear to their conjuncts]] (p??).) So we should allow $P_0\&\neg P_0$ to have an impossible verifier. However, a single impossible state, of which every other state is a part, will not properly serve our purpose, since then $P = P_0\&\neg P_0$ will contain every proposition. Thus the only satisfactory solution is to admit a diversity of impossible states, each verifying their own different impossible proposition (p??).

I agree that this is a problem, but the blame may not lie entirely with worlds. The argument relies as well on a certain conception of content-inclusion ($\leq$ here has the grammar of a connective, like $\supset$):

(P′) $B \leq A$ iff

(i) each of A's verifiers contains a verifier for B, and
(ii) each of B's verifiers is contained a verifier for A.

This is not (quite) how I think of inclusion. It is not, for that matter, how Fine thinks of inclusion, and the reason is roughly the same for both of us. My definition (and Fine's too) has a third clause:

(P′′) $B \leq A$ iff (i), (ii), and

(iii) each of B's falsifiers is a falsifier for A

The third clause may be ignored in many contexts, but not here. Let the contradiction in question be *Snow is white and not white*. This seems in danger of including *Grass is red* only because we have forgotten the falsifiers. *Grass is red*'s falsifiers include, for instance, the fact that grass is green. That grass is green is not a falsifier for *Snow is white and not white* on either of our accounts. Note, no appeal has been made here to impossible states. It is not clear, at least from this example, why "the only satisfactory solution is to admit a diversity of impossible states, each verifying their own different impossible proposition."

Consider another objection Fine might have made. How without a plethora of necessary states are we to prevent *Grass is red* from including *Snow is white or not white*? The latter's verifiers are trivial and by similar logic part of every state whatsoever. This time the answer is obvious. The truthmaker theorist's signature

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move is to have $P \vee \neg P$ verified by whatever verifies P, or $\neg P$, as the case may be. If that is granted, then Q cannot include $P \vee \neg P$ even by the lights of (P′), except in the unlikely case where P's verifiers are included in, or implied by, verifiers for $\neg P$. Impossible and necessary states may be required somewhere, but not here.

Objection (Fine): This just delays the inevitable. Hyperintensional states are still needed even if parthood is held to require (iii) in addition to (i) and (ii). This time let A and B be $(P\&\neg P)\&(P \vee \neg P)$, and $Q \vee \neg Q$. Clearly B should not come out part of A, but it does on the (i)(ii)(iii) criterion. The empty intension $\varnothing$ is B's sole falsifier and also falsifies A; so all of B's falsifiers are falsifiers for A. All of B's verifiers are likewise parts of, or at any rate implied by, verifiers for A, since A is also verified by $\varnothing$.

If we can't with intensional states stop B from being part of A, then isn't Fine correct that we will have to appeal at some point to hyperintensional states? He absolutely is. Ii claim only that a "good amount" of linguistic hyperintensionality can be accommodated intensionally. Intensions suffice to explain why $Q \vee \neg Q$ is not part of P, even if not why $Q \vee \neg Q$ is not part of $(P\&\neg P)\&(P \vee \neg P)$. If intensions suffice for "standard" cases, then that is interesting and good to know. It's the kind of result that comes to light only if we do what we can with coarse-grained states before bringing in the heavy artillery (Sect. 4)

Anyway the heavy artillery may not be needed, if *pluralities* of facts are allowed as verifiers. $P\&\neg P$ is verified for Fine by a P-flavored impossible state, the conjunction of states **r** and **s** that make P true and false respectively. One could equally say, it seems, that $P\&\neg P$ is verified by a pair of states: **r** and **s** taken together. Granted that $\mathbf{r} \wedge \mathbf{s}$ must be hyperintensional, lest it collapse into $\mathbf{t} \wedge \mathbf{u}$, the pair **r** and **s** will not collapse into **t** and **u** provided all are distinct sets of worlds.

This is hardly a panacea. Parthood too would have to be formulated in plural terms. Instead of (i), we'd have (i*): whenever some states jointly verify A, they (together) include each of a bunch of states verifying B.[6] (ii) would become (ii*): whenever some states jointly verify B, there are states jointly verifying A that (together) include each of the B-verifiers. This is clumsy and requires fancier logic. How to trade these things off against the comforts of possible worlds is not clear, but Fine's way is far less devious; and come the revolution we may find ourselves pining for the comforts of states.[7]

3 Methodology

A semantic phenomenon can be grounded in a worldly analogue of the phenomenon; think of predication for instance. Fine makes good use of this method. Content-inclusion is traced back to part-whole relations on states. Content-subtraction, as in *A but possibly for B*, derives from a subtraction operation on

6FL01 [6] This is a plural analogue of the requirement that each A-verifier includes a B-verifier.

7FL01 7FL02 [7] The clumsiness can to some extent be avoided by adopting Fine's way of talking, while treating "**a** ∧ **b** includes **c**" as code for "**a** and **b** include **c** between them."

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states. Counterfactuals track potential-outcome-of states. Something like presupposition seems to be at work in "differentiated" states like <*X*, *y*>, *X* functioning as a "logical precondition" of *Y* (the state, for instance, of my having dinner *too*). . This is very much a feature for Fine, not a bug. He conceives of semantic relations as "lifted" in many cases from relations already holding on states.[8]

A line will have to be drawn somewhere, though, if semantic phenomena are to be satisfyingly *explained*. Let me try to evoke the "appropriate sense of bewilderment" (quoting Quine) with some analogies. Why are some connectives truth-functional while others aren't? One idea about this is that # is truth-functional if and because

(T) whether *A*#*B* is true turns entirely on whether *A*, *B* are true.

Alternatively one might postulate the existence of functions taking truth-values to truth-values, and say that # is truth-functional if and because

(T′) # expresses a truth-function.

The first approach is preferable, I take it.[9] It is not that & fails to express a truth-function. But there is a question of how it comes by this property. A truth-function can be coherently assigned to it only because & is truth-functional in the sense of (T). Fine may well agree with this. But the idea of "lifting" metaphysical features to language puts one in mind of (T′). *Necessarily, A* is true, on one account of intensional operators, if and because

(N) *A* would still have been the case, no matter what else had been the case.

Or, we might think it true if and because

(N′) the fact (or proposition) that *A* is a necessary fact (or proposition).

The first, unprimed account seems to get things the right way around. It is because *A* holds regardless that that we associate it with a necessary proposition, a proposition with the feature of holding in all possible worlds.

What about a hyperintensional operator like $\leq$? Looking back at (P′), we see that part-whole figures twice in it—as a sentential operator (or connective) on the left, and on the right as a relation on states. Some might hope for an unprimed alternative with nothing mereological on the right hand side.

This admittedly may not be possible. What could play the part of (P) to Fine's (P′)? Suppose we put *B's verifier is necessitated by A's* in place of *B's verifier is part of A's*. Necessitation does not suffice in general for parthood; a thing's redness necessitates that it is red or green but does not include its being red or green. But we are talking about a relation on verifiers, and verifiers are not supposed to be disjunctive. Clearly a lot more would have to be said here.[10] But this is *a* reason the world theorist might give for preferring something along the lines of (P) to (P′).

8FL01 [8] Quine had it backwards, on this view, when he said that ontology recapitulates philology.

9FL01 [9] (T) is in the spirit of Tarski and Davidson; (T′) is perhaps more like Frege.

10FL01 [10] "Necessitation for the world theorist is nothing more than the subset relation, and that relation is too
10FL02 coarse-grained to distinguish parts from mere consequences." But it is the special relata that are supposed

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4 Granularity

"Hyperintensional" is applied to all kinds of things, and the concept is correspondingly elastic. *States* **s** are hyperintensional if they are distinguishable even when each necessitates the other. A *context* $\varphi(\ldots)$ is hyperintensional if $\varphi(A)$ may differ in truth-value from $\varphi(B)$ even when A holds in the same worlds as B. *Contents* $\boldsymbol{C}$ are hyperintensional if $\boldsymbol{C}$ holding in the same worlds as $\boldsymbol{D}$ does not mean the two have to be identical.

A *semantics* is hyperintensional (this is somewhat stipulative) if its account of hyperintensional contexts appeals to hyperintensional contents. Such a semantics traffics by definition in hyperintensional contents, but not necessarily in hyperintensional *states*. My preference in *Aboutness* was to try to get by just with the contents, for reasons already mentioned: certain amount of semantic hyperintensionality can be handled with contents that owe their hyperintensionality to their varied relations with intentional states. **p** vs ¬p is a different distinction from **q** vs ¬q even if **p** and **q** are sets of worlds. I am sure that Fine has a better idea than I do of when hyperintensional states become indispensable. Having kicked away the intensional ladder, he may find the issue uninteresting. But, just as physicists care about the range of applicability of Newtonian models, we should care about the range of applicability of world-based models. This will be hard(er) to judge if we reach for hyperintensional states at the earliest opportunity. (The second reason, again already mentioned, is to do with explanation).

One question is whether we *need* fine-grained states to address certain phenomena. I have been suggesting that a plurality of coarse-grained states may be enough for certain purposes. But suppose (a supposition I agree with) that fine-grained, hyperintensional, states are needed for certain purposes too. Then the question becomes, can the world-theorist *build* such states out of the resources she's allowed herself?

5 Statecraft

Aboutness builds them out of sentences, following van Fraassen in "Facts and Tautological Entailment." The role of hyperintensional states in his work is to provide a semantics for first degree entailment. A relevantly entails B, he shows, iff a state of affairs that verifies A also verifies B. What enables $P\&\neg P$ to entail P but not Q is that there are impossible states $\mathbf{p} \wedge \overline{\mathrm{p}}$ which verify P but not Q. States of this

10FL03

10FL04 Footnote 10 continued

10FL05 to carry this burden, not a special relation. "How are we supposed to pick out the special relata? States of

10FL06 Fine's sort (unlike sets of worlds) are non-disjunctive by nature." True, but this just pushes the problem

10FL07 back a step, for how are the genuine Finean states to be distinguished from the pretenders? (Recall the

10FL08 "solution" to Goodman's projectability problem which had it that a predicate F is projectible if and

10FL09 because there is such a property as Fness—such a *universal* as Fness).

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typr will violate *Possibility*—$\mathbf{p} \wedge \overline{\mathbf{p}}$ cannot obtain—and *Intensionality* too— $\mathbf{p} \wedge \overline{\mathbf{p}}$ is a different impossible state from $\mathbf{q} \wedge \overline{\mathbf{q}}$.[11]

Can we make fine-grained states out of worlds rather than language? Fine considers a version of this in his commentary:

> For me, a state space might be taken to consist of (i) a set of states, (ii) a distinguished subset of possible states and (iii) a relation of part-whole on the states. No assumption is made as to the inner structure of the states, they are simply taken as given. For Yablo, a state space might simply be identified with a family of non-empty sets of worlds. Each such state will be possible (obtain in some world); and one such state is naturally taken to be a part of another if it set theoretically contains the other (so that, necessarily, it obtains when the other obtains). Thus a Yablo state space may be regarded as a state space in my sense by taking all of its states to be possible and by taking the relation of part-whole to be set-theoretic containment. But the converse does not hold and there is no reason why a state space in my sense should even be isomorphic to a Yablo-like space (p??)

This is true, but Fine is arguably looking in the wrong place. Spaces built on Yablo's *coarse*-grained states are no match for what Fine is offering. But that is to be expected; coarse-grained states are non-hyperintensional by design. A less language-dependent analogue of van Fraassen's hyperintensional alternative may do better.[12] A fine-grained state $\mathcal{S}$ should be, not a set of worlds, but a set of such sets; it should be a set, in other words, of coarse-grained states $\mathbf{s}$.[13] $\mathcal{S}$ is impossible iff its members $\mathbf{s}$ have no worlds in common. $\mathcal{S}$ contains $\mathcal{T}$ iff every coarse-grained $\mathbf{t}$ in $\mathcal{T}$ belongs also to $\mathcal{S}$, or, better, every $\mathbf{t}$ has a subset in $\mathcal{S}$.

Of course Fine's point may hold as well of *refined* Yablo spaces built on (collection-of-sets) states like $\mathcal{S}$. I thought at first it did. There is nothing in the definition of a state space to rule out infinite descending chains of states, each included in the one before it. Whereas there is something in the definition of a sets that prevents this. Sets are well-founded, which means no infinite descending chains.

But this is mixing apples and oranges. The standard notion of set bars infinite decreasing *epsilon* sequences, sequences $\mathbf{x}_1, \mathbf{x}_2, \mathbf{x}_3, \ldots$, such that $\mathbf{x}_{n+1}$ is a member of $\mathbf{x}_n$. But set membership was never the model for part-whole on states; it is modelled by the *subset* relation. And sequences $\mathbf{x}_1, \mathbf{x}_2, \mathbf{x}_3, \ldots$, such that $\mathbf{x}_{n+1}$ is a *subset* of $\mathbf{x}_n$ are plentiful even in a well-founded universe. (Let $\mathbf{x}_n$ be the set of natural numbers larger than n). I don't know to what extent set algebras can capture the variety of state spaces. This much at least seems plausible: refined Yablo spaces approximate state spaces better than the coarse originals.

11FL01 [11] This all goes by very quickly in *Aboutness*; van Fraassen-type states are definitely not the focus.

12FL01 [12] Fine sketches this construction himself, he points out, in Fine (2016).

13FL01 [13] Or, a pair of sets of coarse-grained states, one specifying what it takes for $\mathbf{s}$ to obtain, the other what it
13FL02 takes for $\mathbf{s}$ to fail.

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6 Subject matter supervenience

Suppose that A and B are truth-functional combinations of the same atoms. Must they agree in subject matter? Fine answers in the affirmative.[14] How the atoms are combined makes no difference. I err, he thinks, in distinguishing the subject matters, e.g., of $P\&\neg Q$ and $\neg P\&Q$. Subject matters are not that various or that fine-grained.

This surprised me at first. A sentence A's subject matter does not in Fine's view supervene on the *sub*atomic expressions occurring in A.

> Yablo and I are both interested in a notion of subject matter that has to do not only with the objects that a sentence is about but also with what it says about those objects. This is amusingly illustrated in his contrast between the two headlines MAN BITES DOG and DOG BITES MAN (p. 24). Each is about the same objects (man, biting, dog), but the subject matter is different (...??)

Rearrangement of *sub*atomic constituents can change the subject for both of us. I extend this to atomic constituents, and he does not. This is fine in principle but it raises a tricky question. How bright a line can be drawn between rearrangements *of* atoms and rearrangements *within* atoms?

From the *Man bites dog* example, it seems that Rxy differs in subject matter from Ryx when R expresses an asymmetric relation. Some such relations supervene, though, on the properties of the relata taken separately. Whether x is speedier than y is a function of x's speed and y's speed. Suppose for example's sake that there are only two speeds: fast and slow (= not fast). Then x is faster just if it alone is fast, and y is faster just if x alone is slow.

Sxy iff $Fx\&\neg Fy$
Syx iff $\neg Fx\&Fy$
neither if $Fx \leftrightarrow Fy$

Can the subject matter change between Sxy and Syx, but not $Fx\&\neg Fy$ and $\neg Fx\&Fy$, when Sxy is just short for the first conjunction and Syx is short for the second? Aboutness differences ought not to disappear, one would think, when we spell the contents out more fully; if anything they should come out more clearly when submerged content is exposed.

There is a natural fallback position: *Rab* differs in subject matter from *Rba unless* the sort of factorization is possible whereby both are built on the same atoms. I don't have a decisive objection to this, but it is walking a fine line Take again the same case, only this time let's allow a fuller range of speeds. And let's change the verb to *beats*, where the winning animal is the one whose top speed is higher. If D_k (M_k) says that the dog (man) in question can run k miles an hour, then *Dog beats man* is to *Man beats dog* as (a) is to (b):

(a) $D_1\&\neg M_1 \vee D_2\&\neg M_2 \vee \ldots,$
(b) $M_1\&\neg D_2 \vee M_2\&\neg D_2 \vee \ldots,$

[14] Fine distinguishes three standards by which subject matter identity might be judged (these are given below). He takes them all seriously, but expresses in the end a preference for the third and laxest standard. This is the standard I foist on him in the main text. His true position is more ecumenical.

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These ought, on Fine's criterion, to be subject-matter identical. But then it is hard to see why the same should not hold of *Man beats dog* and *Dog beats man*. (If it spins subject matters too fine to distinguish (a) from (b), it spins them finer to distinguish (a) from *Dog beats man* and (b) from *Man beats dog*.) If that is right, then we cannot decide whether *Man b...s dog* shares a subject-matter with *Dog b...s man* until we are told whether the verb is *bites* or *beats*. I agree by and large with Fine's judgment about (a) and (b), but it comes at a cost: (a) has to be subject-matter-distinct from a sentence that in some sense just abbreviates it. I would rather make my peace with the first distinction than be forced into the second.

Surely though we ought to be less concerned about intuitive judgments than theoretical utility. And Fine's notion is remarkably powerful and useful (see below) But my notion does some good things as well. It allows us to say, for instance, that B is part of A iff the inference from A to B is truth-preserving and subject matter preserving.[15] It allows us to define $A \sim B$ is the part or portion of A that is not at all about the matter of whether B.

7 Subject matter identity

P and Q are aboutness-equivalent, for Fine, if the same states bear on P as on Q. Their subject matters must therefore be entities of a kind that are identical iff P and Q are indiscernible in this respect. This may be arranged by letting P's subject matter *be* the set of states that bear on it—what Fine calls P's closure. P and Q agree in subject matter just if the one's closure is identical to the other's.

This is only a schema, for we have yet to explain when a state bear on P. He considers three conditions:

Identity If a state s verifies P, then it bears on P
Part Any part of a state that bears on P also bears on P.
Fusion The fusion of states bearing on P bears on P.

And he distinguishes three accounts of subject matter, according to which of these is respected. The minimal account respects only *Identity*. P's closure is the set of its verifiers, so

$P \approx_1 Q$ iff P's verifiers are the same as Q's.

(The terminology can be confusing; the account is "minimal" with respect to the amount of subject matter agreement it recognizes, hence maximally discerning.) The intermediate account brings in *Part*. P's closure is the set of its verifiers and states included in those verifiers.

$P \approx_2 Q$ iff the parts of P's verifiers are the parts of Q's.

[15] Fine does not see the point of this: "For although we might reasonably insist that it should be necessary for P to contain Q that the subject matter of Q be included in that of P, it is not clear why containment should not amount, in the presence of the forward condition, to something more than subject matter preservation." Perhaps. But subject matter preservation *ought* to carry this load, arguably. This has been a recurrent theme in relevance logic; Fine mentions Parry (1989).

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The maximal account brings in *Fusion*. *P*'s closure is the set of its verifiers, their parts and fusions, *their* parts and fusions, and so on.

> $P \approx_3 Q$ iff the same states are obtainable from their respective verifiers by closing under parts and fusion.

As a test case consider $P \vee Q$ and $P \vee (P\&Q)$. Do they differ in subject matter? They do on the first account, but not the second. $P\&\neg Q$ differs from $\neg P\&Q$ on the second account but not the third.

The last of these, Fine points out, is subject to "a striking simplification"; we may identify the subject matter of *P* with the *fusion of all its verifiers*. This fusion has the nice feature of being "just one more state," and so the same type of thing as a verifier. It is, to be sure, an impossible state, if *P*'s verifiers cannot all hold together. And the state that constitutes *P*'s subject matter is unavoidably impossible if the falsifiers are lumped in too (as he later proposes). This should not bother us, though; the question about the states that are subject matters is not whether they obtain, but what they contain. *P*'s subject matter thus conceived "encodes" *P*'s verifiers, and parts and fusions thereof, in a beautifully simple way: a state belongs to that set iff it is part of the aforementioned fusion.

Now it is a familiar point about set theoretic vs mereological ways of gathering things together that the first has greater resolving power. The identities of *x*, *y*, and *z* are lost when they're fused, and preserved when they're formed into a set. Sets have a kind of "unique readability" feature; they bear the marks of their own construction.

But while there is only one membership-tree for each set, there are any number of mereological decompositions for each fusion. A sphere is no more the sum of its slices than of its sub-spheres. (The relation between covers and covered is many-one.) Fine responds with an extreme egalitarianism which bundles the components of *every* decomposition together into a hugely redundant package. (He chooses in effect to surrender the extra resolving power by opting always for the *largest* set whose members sum to the same as *x*, *y*, and *z*). This works beautifully as far as the math goes. But it assumes the extra resolving power was unneeded. Fine is aware of this and of cases where it *seems* needed. But I am not sure what his ultimate take is on these matters.

8 Grades of identity

What does it mean in practice for the states bearing on *P* to be closed under fusion and inclusion? A *Q* whose verifiers are thoroughly interspersed with those of *P* will have to agree in subject matter with *P*, even if the one raises issues on which the other is silent. I will use an example I heard in effect from Fine. Let *P* be the proposition that *continuous* motion occurs, while *Q* has it simply that things move; continuity doesn't come into it. *P* is verified by the state c of a certain particle following a certain continuous trajectory from noon to 1:00 PM. Consider the part d of that state that confines itself to some scattered set of moments within the interval, say, 12:00, 12:30, 12:45, and so on. This scattered substate d, though it verifies only

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Motion occurs—not *Continuous motion occurs*—nevertheless bears on *Continuous motion occurs*, by being part of a verifier. Meanwhile $\subset$ bears on *Motion occurs* since it verifies it. But then it is hard to see how the subject matter of *Continuous motion occurs* can differ from that of *Motion occurs*. Their verifiers are instructively different, but the differences are obliterated when we close under fusion and inclusion.[16]

Or consider a pixelated-grid world where verifiers and falsifiers are always to the effect that certain points are "on" while others are "off." I am not sure (bearing in mind Fine's incorporation of falsifiers into subject matter) that there can be any subject matter differences at all in this setting.[17] Let P say that there are at least three solid squares, and let Q say that every hollow closed figure has a mirror image. Pick any points x and y that you like, for x to be "on" figures in at least one verifier both for P and for Q, and similarly for y to be off. But now, every state whatsoever is the fusion of pointillistic on/off facts. So every state whatsoever figures in the subject matter both of P and of Q.

Fine's notion blurs intuitive distinctions, or at least runs a risk of blurring them depending on the application. To which the reply is that my notion errs in the other direction, drawing more distinctions than are warranted. So, for instance, A cannot share my kind of subject matter with B unless A and B draw the same line through logical space, in the sense that either A and B are true in the same worlds, or A and $\neg B$ are true in the same worlds. $P\&Q$ shares for me a subject matter with $\neg P \vee \neg Q$, but not with $P \vee Q$. I do think there is something to be said for this, for instance, it puts worlds where $P\#Q$ changes truth-value at a greater distance than worlds in both of which it is true, and for the same reason. But there is something to be said against it as well, for the following are, Fine shows, inconsistent

(a) $P\&Q$ differs in subject matter from $P \vee Q$,
(b) S shares a subject matter with $\neg S$.
(c) de Morgan equivalents agree in subject matter.
(d) subject matter is compositional.

The argument is surprisingly simple:

1. $\mathrm{sm}(\neg P) = \mathrm{sm}(P)$ and $\mathrm{sm}(\neg Q) = \mathrm{sm}(Q)$ (by (b))
2. $\mathrm{sm}(\neg P\&\neg Q) = \mathrm{sm}(P\&Q)$ (by (d))
3. $\mathrm{sm}(\neg(\neg P\&\neg Q)) = \mathrm{sm}(P\&Q)$ (by (b) and (2))
4. $\mathrm{sm}(P \vee Q) = \mathrm{sm}(P\&Q)$ (by (c) and (3))
5. but $\mathrm{sm}(P \vee Q) \neq \mathrm{sm}(P\&Q)$ (by (a))
6. contradiction ((4), (5))

I do not know how to reconcile all of this except by allowing multiple notions of "sameness of subject matter," ordered by strength; which was Fine's idea (we saw in Sect. 7) from the beginning.

16FL01 16FL02 [16] Similarly *There are twin primes* (primes differing by 2) threatens to agree in subject matter with *There are primes.*

17FL01 17FL02 [17] Better, not between "general propositions," propositions to which ever part of the grid is potentially relevant.

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9 Relational conception of subject matter

Aboutness moves back and forth between two ways of conceiving subject matter. Take the number of stars. It can be rendered either as

(i) the relation one world bear to another iff they have equally many stars, or
(ii) a set of propositions listing the ways matters can stand #-of-stars-wise.

The first approach Fine calls the relational conception of subject matter. The second is the "cellular" conception, the "cells" being the sets of worlds that constitute coarse-grained propositions. Following Lewis in (1988), these might be seen as alternative formulations of the same idea, inasmuch as one can recover the relation from the set of propositions and vice versa. The recovery takes different forms depending on the kinds of relation suited to serve as subject matters.

If we limit ourselves, like Lewis, to equivalence relations, then the propositions are equivalence classes: maximal sets of pairwise equivalent worlds. These taken together make up a *partition* of the relation's domain. If we open the door to similarity relations, as in *Aboutness*, then the propositions are *similarity* classes: maximal sets of pairwise similar worlds. These needn't constitute a partition since the classes can overlap; the set of similarity classes is, in my terminology, a *division* of the relation's domain.

The advantage of similarity relations is that they open the door to intransitive subject matters like the number of stars give or take ten, or where to get an Italian newspaper; that u is in the relevant sense similar to v, and v to w, does not ensure that u is similar to w. Another intransitive subject matter is observation, on the theory that u can be observationally indiscernible from v, and v from w, while u can be told apart from w.

If one wants to get more general yet, then, Fine shows, the cellular conception is better; there are more ways of grouping worlds into sets than similarity relations on those worlds. He makes the point with a simple model. Consider two covers $\mathbb{C}_1$ and $\mathbb{C}_2$ of a given set S of worlds (a "cover" of S is a collection of subsets which sum to the whole). $\mathbb{C}_1$ has *one* member containing *all* the worlds in S. $\mathbb{C}_2$ has *many* members comprising all the *pairs* of worlds in S. These are obviously very different. But they correspond to the same similarity relation, if worlds are counted similar when a set in $\mathbb{C}$ has a member containing both. For let v and w be any two worlds whatever; they come out similar by these standards. The similarity is witnessed in the one case by a big set, containing v and w along with everything else; and in the other by the small set whose only members are v and w. But the similarity relation is the same.

This is not decisive against the relational conception as such, since the relation r_1 that holds between any two worlds is distinct from a relation r_2 that links each world to its image under some fixed permutation. But if covers are defined as above, then it is true that not every cover-based subject matter has a corresponding relation. The color(s) of my car has a cell, we may suppose, where my car is red, and a smaller cell where it is spitfire red. Clearly there can be no relation r such that the smaller set and the bigger one *both* pack in as many r-related items as possible. S's covers are

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more various, not only than the similarity relations defined on S, but than binary relations generally.

10 Restriction

If A and B are true about the same subject matter, it seems their conjunction should be true about that subject matter as well. I do not get this result, because truth about m for me is a kind of possibility. A is true about m in w if, although perhaps false overall, is not made false by the state of things m-wise in w. A could have been true under the exact same m-conditions as obtain in w. That A can be true under the same m-conditions, and B as well, does not mean their conjunction has this property.

This comes out most clearly if B is $\neg A$. *Cats exist* is true about dogs, since the state of things dog-wise puts no barriers in the way of their existence. The state of things dog-wise is tolerant as well of cats not existing. What cats cannot do, however, compatibly with prevailing canine conditions, is to exist while also not existing. The actual world can be morphed into an A-world u without changing its m-condition, and also into a not-A-world v. But u and v are not the same world! If they were, it would have to be a world where contradictions hold. For if A is true in u (= v) and $\neg A$ as well, then $A\&\neg A$ will have to be true in u. And $A\&\neg A$ is not true in any world.

Not in any possible world, anyway, and u is assumed to be possible. How does Fine avoid this result? A Finean subject matter m is just one more state of affairs $\mathbf{m}$. A is true about m in w if some $\mathbf{a}_i \sqcap \mathbf{m}$ obtains in w—where $\mathbf{a}_i$ is a verifier for A, and $\mathbf{x} \sqcap \mathbf{y}$ is their meet or overlap (the largest state that is part both of $\mathbf{x}$ and $\mathbf{y}$), and obtaining in w is being part of w. If A^{m}, the part of A about $\mathbf{m}$, is the proposition with those overlaps as truthmakers, then A is true about $\mathbf{m}$ in w just if A^{m} is true outright in w.

Now suppose that A and B are both true about $\mathbf{m}$ in w. Then w has as parts $\mathbf{a}_i \sqcap \mathbf{m}$ and $\mathbf{b}_j \sqcap \mathbf{m}$ for some i and j. But then it contains the fusion $(\mathbf{a}_i \sqcap \mathbf{m}) \sqcup (\mathbf{b}_j \sqcap \mathbf{m})$ of those two overlaps, which (on plausible assumptions) witnesses the truth of $A\&B$ about $\mathbf{m}$ in w. This holds in particular where B is the negation of A.

But, how does a contradiction ($A\&\neg A$) manage to be true about *anything* in w? Well, it is true about $\mathbf{m}$ in w just if $(A\&\neg A)^{\mathsf{m}}$ is true in w outright; $(A\&\neg A)^{\mathsf{m}}$ is the same proposition as $A^{\mathsf{m}}\&(\neg A)^{\mathsf{m}}$; and both conjuncts are by hypothesis true in w. They are both true because they are both trivial, and likewise their conjunction. *Cats exist and don't exist* is true about dogs because the part of it that concerns dogs is null; it doesn't address the matter of dogs at all.

This is puzzling, because it holds on my theory too that both *Cats exist* and its negation say nothing about dogs, and that *Cats exist* $^{\mathtt{dogs}}$ and *Cats don't exist* $^{\mathtt{dogs}}$ are empty claims. Why does (*Cats exist and don't exist*)$^{\mathtt{dogs}}$ not inherit this emptiness for me as it does for Fine? $(A\&B)^{\mathsf{m}}$ is not the conjunction of A^{m} with B^{m}.

This actually does some work in the book. The reason multi-premise closure appears to fail in Sorites reasoning is that the premises are true *individually* about **observation**, but not collectively. Or consider the temptation to say *It is, and it*

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isn't of a borderline case. This makes sense on the hypothesis that each statement taken separately is true about the matter under discussion. (It could be either red or not, given how matters stand **m**-wise).[18]

I am not particularly looking, then, for a once-and-for-all answer to whether $(\ldots)^{\mathtt{m}}$ should distribute over conjunction. (I did suggest one in *Aboutness*, and Fine rightly objects) If truth about **m** should sometimes, but not always, be judged anew for complex sentences, we want to be able to go either way. $P\&\neg P$ comes out false about **m** if we take the first approach, but may be true if we take the second, and the state of things **m**-wise leaves P undecided.

This hardly scratches the surface of Fine's theory of partial content. He has found beautifully simple fixes for a number of self-inflicted wounds in this area. Here is one of my favorites, from the paper's last footnote:

> Yablo mentions another difficulty (fn. 15, p. 32), which is that "there is not always such a thing as a part of A about **m**" for "it will have … to be included in A's subject matter **a**" and "connect up somehow with **m**", which will be impossible "if **m** and **a** are unrelated." But I would have thought that the part of A about **m** will be the part about the common part of the subject matter of A and **m**, which will be the "null" subject matter when **m** and **a** are unrelated (p??).

I probably would have thought that too, if I had thought of it; it is too good not to be true. Fine's greatest-common-factor solution will have to go for now into category (3)—too far-reaching for me to properly assess just yet—but it may well wind up in (2)—points I cannot take on board and that appearfavor Fine's view.

11 Subtraction and conditionals

The book features two "new" conditionals—the *incremental* (written $A \sim\!\!> C$) and the *suppositional* ($A \nearrow C$). The first agrees intensionally *and* in its verifiers and falsifiers with the remainder when A is subtracted from C. The second agrees intensionally with the material conditional $A \supset C$ but owes its truth/falsity (when A is true) to whatever verifies or falsifies C. Fine gives both of these a makeover, and brings out connections between the conditionals thus remade and intuitionistic ($\mapsto$) and counterfactual conditionals as explained in Fine (2012, 2013).

I will focus here on the relation between $A \sim\!\!> C$ and $A \mapsto C$, which I first heard about from Robert van Rooij. Fine's semantics for $\mapsto$ is algebraic. We are given a "residuated lattice" of states—*residuated* in the sense that for any s and t, a least u exists (call it $\mathtt{t}$–$\mathtt{s}$ such that $\mathtt{t} \sqsubseteq \mathtt{u} \sqcup \mathtt{s}$. A state verifies $A \mapsto C$, for Fine, iff it is the fusion of all $\mathtt{a}^*$–$\mathtt{a}$, for some function * from A's verifiers **a** to verifiers **c** for C. $A \mapsto C$'s truthmakers are thus all and only states **k** that take

> the members of {**a** | **a** verifies A} to members of {**c** | **c** verifies C}.

18FL01 [18] No such defense can be given of *It is and isn't*, which is a much stranger thing to say.

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One can think of these **k**'s as "unrestricted tickets" from A to C, enabling passage from whatever A-verifier comes along to a verifier for C. And now the analogy is clear, for my truthmakers too are unrestricted tickets from A to C, albeit not in quite the same sense. $A \sim > C$) is made true by all and only κ's (using greek letters now) taking

> the *disjunction* of $\{\alpha|\ \alpha$ verifies $A\}$ to the *disjunction* of $\{\gamma|\ \gamma$ verifies $C\}$

The idea of "taking" A to C involves for both of us a certain sort of efficiency. Fine's condition on **k**, very roughly, is that no **k**- $<$ **k** yields C (strictly, **c**) when combined with A (strictly, **a**). My condition on κ is that no A- $< A$ combines with κ to yield C.

The first, condition is prima facie stricter; whatever takes each **a** (α) to some **c** (γ) is certainly going to take the disjunction of α's (**a**'s) to the disjunction of γ's (**c**'s). Whereas a κ taking one disjunction to the other may or may not turn on relations between particular αs and γs. $A \mapsto C$ looks so far like it is going to be stronger on the whole than $A \sim > C$.

But matters are not so simple, for the truthmakers are drawn from diifferent pools. Fine's truthmakers **k** are apt to be (fusions of) special "condtional connection" states **c**–**a** whose whole nature lies in the fact of suitably combining with A to obtain C. Mine are meant to be ordinary states which are *picked out* by their property of suitably combining with A to obtain C. A paradigm incremental conditional for me is $p \sim > (p\&q)$; it reduces to q. Fine if I understand him has $p \mapsto (p\&q)$ turning on a special connection state **p**&**q**–**p**.[19]

I sense a tradeoff here between compositionality and evaluability. A targeted truthmaker for $A \supset C$ is not something just passed along from the truthmakers of its components. It's a synergistic affair that trades on the components' relations. This is why **q** wins out as a targeted truthmaker for $p \supset (p\&q)$ over $\overline{\text{p}}$ and **p&q**. But, that is just one example. When in general

> is a state a [targeted] truthmaker for a material conditional? Yablo does not say (p??).

I do say for the propositional case. A sentence's truthmakers correspond to what Quine called its prime implicants, which line up in turn with its minimal models. $p \supset (p\&q)$ is not made true by **p&q** because **q** already suffices. It is made true by $\overline{\text{p}}$ but not in a targeted way since $\overline{\text{p}}$ conflicts with the antecedent. **q** thus emerges as the one targeted truthmaker, whence $p \sim > (p\&q)$ equates to q. All this is perfectly definite and objective, if not to everyone's liking, for instance in being un-hyperintensional. The non-propositional case is definite too, modulo a selection of facts suited to serve as truthmakers.[20]

None of this affects Fine's basic point. His semantics is compositional and mine (if we can even call it a *semantics*) is not. This is a shining achievement that I salute and marvel at. I wonder though if something is lost when truth-assignments are

19FL01 [19] Further reducible, perhaps, to q–p.

20FL01 [20] See Yablo (2016).

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relativized to states, in particular states sharing a form with the sentences they verify. It makes the logic easier but the real-world assignment of truth-values harder. If I want to know whether $p \sim > (p\&q)$ is "really true," I need only ask myself whether q. To determine whether $p \mapsto (p\&q)$ is "really true," I must ask myself whether the actual state of things, the largest one that obtains, contains a connection-state **p**&**q**–**p**. This looks like a restatement in metaphysical mode of the original question. (I don't know how much to be bothered by this; it could conceivably be a *good* thing from some perspectives).

12 Conclusion

Here finally are some *further* truthmaker-related issues that it would be good to talk out sometime: assertive content, permission, enthymemes, paradox, verisimilitude, "ways," the by-locution, and (something that Kit indeed mentions) relevance without minimality.

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