A Plea for Inexact Truthmaking*

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In a recent series of papers,[1] Kit Fine has begun to make a persuasive case for exact truthmaker semantics, a version of situation semantics with revolutionary potential.[2] Possible worlds, the workhorse of the currently dominant framework for doing semantics, fall by the wayside, replaced with finer-grained, fact-like states. But beyond this step, which had already been made by situation semanticists, Fine advocates adoption of exact truthmaker semantics's namesake relation: exact truthmaking (or exact verification). This contrasts with the inexact truthmaking (or verification) relation used in the familiar versions of situation semantics (they usually call it 'support' or 'truth in a situation').[3] Application of the exact truthmaking relation, according to Fine, allows for elegant solutions to

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[1]Primarily Fine (ms[e]), Fine (forthcoming), Fine (ms[a]), Fine (ms[b]), and Fine (ms[f]), but also Fine (2012), Fine (2014a), Fine (2015), Fine (2014b), Fine (ms[c]), and Fine (ms[d]). Friederike Moltmann is another author who makes use of exact truthmaker semantics in a couple of recent papers: Moltmann (forthcoming) and Moltmann (ms).

[2] "By giving up their intensionalist ideology," Fine concludes one paper, "the semanticists of the world have nothing to lose but their chains" (Fine, ms[f], p. 39).

[3]See Barwise and Perry (1983), Barwise (1989), Kratzer (1989), Kratzer (2002), Kratzer (2007) Elbourne (2013, Ch. 1), among others. Fine seems to think that inexact truthmaking is the very same relation as truth in a situation and that situation semantics can be assimilated with inexact truthmaker semantics. See, e.g., Fine (forthcoming, pp. 3–4). But I have doubts about this. Inexact truthmaking does have some important similarities with truth in a situation, and is certainly closer to it than exact truthmaking is, but it's not clear that it is the same notion. This is an important issue, but not one I will explore further here—I will just go along with Fine and treat them as the same—but it won't make a substantive difference for the issues discussed in this paper.

a diverse array of longstanding linguistic puzzles: among the highlights are accounts of free choice and Ross's paradox, counterfactual simplification, and scalar implicature. It also makes for easy definition of a variety of other useful notions, like partial content, tautological entailment, and subject matter.[4]

But exact truthmaking is more than just a new tool for the semanticist's toolbox; Fine's revolution also has a foundational ambition.

Not only does exact truthmaker semantics provide us new solutions to old problems, it also, according to Fine, is capable of simulating the more familiar tools of truth at possible worlds and inexact truthmaking. Fine, at various points, argues that his preferred notion of truthmaking can be used to define inexact truthmaking—the kind used in more familiar situation semantics—as well as loose truthmaking—a kind of truthmaking which can be used to formulate a semantics equivalent to possible worlds semantics. Exact truthmaker semantics, then, has some claim to be considered an *ur*-theory, one that can be used to construct everything needed to do both possible worlds semantics and standard situation semantics. In the way that set theory is widely seen as the foundational theory in which, in principle, all mathematics can be done, so too, the suggestion is, all semantics could be done in the exact truthmaker framework.[5]

Thus there are two strands of the revolution Fine envisions: the practical, which encourages use of the notion of exact truthmaking in everyday semantic theorizing, and the foundational, which encourages us to reconceive our use of possible worlds and inexact truthmaking, insofar as we continue to use them, as being really, deep down, constructions of what exact truthmaker semantics makes available.

In this paper I challenge the foundational strand of Fine's revolution; I argue that of the two truthmaking relations, we should treat the inexact, rather than the exact, as fundamental. I begin, in Sections 1 and 2, by giving an overview of exact truthmaker semantics and by explicating Fine's argument for treating exact truthmaking as fundamental. Then, in Section 3 I reject his argument on the grounds that its two central premises are false. I argue that Fine gets things backwards: inexact truthmaking can be used to define exact truthmaking, but not vice versa. This sets the stage for an argument, which I give in Section 4, that it is inexact truthmaker semantics,

[4]For an overview, see Fine (forthcoming).

[5]Thanks to Justin D'Ambrosio for suggesting the analogy to set theory.

rather than exact truthmaker semantics, that should play a foundational role.

Before getting started, I should like to say that my intentions are not reactionary. I am no counterrevolutionary. I find the practical component of Fine's revolution congenial and promising, and would like to see exact truthmaking and related notions applied far and wide. And this practical project is where I think the most interesting action will be. However, I think this project can and should be shorn of what I take to be a mistaken foundational claim about the relation between exact and inexact truthmaking.

1 Exact Truthmaker Semantics

We are used to thinking of the central aspect of meanings of (indicative) sentences as truth-conditions and thinking of truth-conditions as sets of possible worlds. The first step on the road to exact truthmaker semantics is to replace the worlds of truth-conditions with something more specific—we replace them with the parts or aspects of the worlds, we'll call them *states*, which would *make* the relevant sentence true.

For example, both (1) and (2) are true in the actual world, but they have different actual truthmakers.

(1) Paris is a national capital.

(2) Buenos Aires is a national capital.

Intuitively, the state of Paris's being a national capital actually makes (1) true, whereas the state of Buenos Aires's being a national capital city actually makes (2) true is. And neither state makes the other sentence true.

Even sentences that are true in all of the same worlds can differ in their truthmakers.

(3) a. Paris is or is not a national capital.
b. Paris is or is not inhabited.

Both of these are true in all worlds where Paris exists, but they have different truthmakers. The state of Paris's being a national capital makes (3-a) but not (3-b) true. The state of Paris's being inhabited makes (3-b) but not (3-a) true. This finer grain is one of the key advantages to using states rather than worlds.

What exactly are these states? As far as the semantics is concerned, we need not delve deeply into this question. As with possible worlds, it's a few very abstract properties of them that do the work, and while it might be of some interest to theorize about the nature of states or facts, it seems like a bad idea to get bogged down in such issues when one's main interest is using them to do semantics. Fine himself is noncommittal—"the term 'state' is a mere term of art" (Fine, forthcoming, p. 5)—and is happy to treat them as primitive or use different things for different purposes (e.g. taking actions to be the 'states' when dealing with imperatives). But for the most part he seems to be thinking of them as fact-like and worldly, rather than representational.

As for the very abstract properties relevant for semantics, what's important is that a part-whole relation, $\sqsubseteq$, be defined for them, and that it be a partial order (reflexive, transitive, antisymmetric) such that each subset of the set of states has a least upper bound ($\sqcup$), or fusion. So given that there's the state, p, of Paris's being a national capital and the state, b, of Buenos Aires's being a national capital, there must also be the state, $p \sqcup b$, which is their fusion. This is the state of Paris's being a national capital and Buenos Aires's being a national capital.

One other property of states worth noting is that Fine does not require verifying states to be actual, or indeed even possible. This means that their relation to sentences is would-be truthmakers/falsehoodmakers, so what a sentence's verifiers and falsifiers are doesn't depend on what is the case. Thus besides the actual state of Paris's being a national capital, there's the possible state of Paris's not being a national capital, and (given the requirement of fusion) an impossible state of Paris's being a national capital and not being a national capital.

The second (and final—it's a short road, or perhaps they're big steps) step on the road to exact truthmaker semantics is using a particular conception of the truthmaking relation: exact truthmaking.

Truthmaking, or verification, is a relation between sentences and states, but when does it hold? The easiest way to specify it is with a counterfactual. A state is a (would-be) truthmaker of a sentence if it would *make the sentence true*, were it actual.[6]But what is it for a state to actually make a sentence

[6]This characterization can, but need not, be treated as an analysis of (would-be) truth-

true? This is where the varieties of truthmaking we will be interested in—exact and inexact—come apart.

Both exact and inexact truthmakers must be sufficient for making the sentence true, in a generic sense of 'making'. The main distinction between them is whether they tolerate extra stuff *beyond* what plays a role in making the sentence true. Exact and inexact truthmaking differ in what they require of the parts of a truthmaking state.

For a state to exactly verify ($\Vdash_e$) a sentence, *every* part of it must be 'relevant' to the truth of the sentence—they must all be involved in a way of making the sentence true. Thus adding, through fusion, to a state that is an exact truthmaker need not result in another exact truthmaker, since this extra part might be irrelevant. For a state to inexactly verify ($\Vdash_i$) a sentence, though, it need only have *some* part relevant to the truth of the sentence.[7] Adding extra parts beyond what is sufficient will result in new inexact truthmakers—the irrelevance of these extra parts is not an issue.

The state of Paris's being a national capital, for example, is relevant to the truth of (1) but not at all relevant to (2). So while $p \Vdash_i$ (1), $p \nVdash_i$ (2). And since p is *wholly* relevant to (1)—its only part is relevant—$p \Vdash_e$ (1), but of course $p \nVdash_e$ (2). The sufficiency of merely partial relevance for inexact but not exact truthmaking comes into play clearly only with complex states. For example, $p \sqcup b \Vdash_i$ (1), since it has a part (viz. p) that is relevant to the truth of (1). That it also has a part, b, which is irrelevant to the truth of (1) is compatible with its being an inexact truthmaker. This is not so with exact truthmaking, however. While $p \Vdash_e$ (1), b's irrelevance to the truth of (1) means that $p \sqcup b \nVdash_e$ (1). $p \sqcup b$ does, though, exactly verify the conjunction (1) $\wedge$ (2), since each of p and b is relevant to it. And this—checking the relation between verifiers of conjunctions and their conjuncts are treated—is a good test for whether a truthmaking relation is exact or inexact. In general, an inexact verifier of $A \wedge B$ will also be an inexact verifier of A. But this is not so for exact verification; except in special cases, an exact verifier

making into more basic notions. We could take actual truthmaking and counterfactuals to be more basic and use them to analyze would-be truthmaking, or vice versa.

[7] It does, though, require that at least some (improper) part be relevant. This contrasts with an even less restricted form of truthmaking, *loose* truthmaking, which only requires that the existence of the state is incompatible with the sentence's being false. Thus any state at all will loosely verify a necessarily true sentence, even if the state has nothing to do with the content of the sentence. Loose truthmaking, as Fine (forthcoming, p. 4) points out, doesn't involve any real advance over possible worlds semantics.

of $A \wedge B$ will *not* exactly verify A, since it will have parts (whatever verifies B) that are not relevant to the truth of A.

Fine also makes use of an independent falsehoodmaking (or falsification) relation, again between sentences and states, which holds when the state makes the sentence false. The same varieties—inexact, exact—are available here as well. A state that inexactly falsifies a sentence ($\dashv\!|_i$) must be partially relevant to the falsehood of the sentence and a state that exactly falsifies ($\dashv\!|_e$) a sentence must be wholly relevant to the falsehood of the sentence.[8] So, for example, the state t of Toronto's not being a national capital is an inexact and exact falsifier of (4).

(4) Toronto is a national capital.

The state t^+ of Toronto's not having mild winters or being a national capital is an inexact falsifier of (4), but not an exact falsifier of it.

We've now introduced the two basic components of inexact and exact truthmaker semantics.

- Truthmakers: fact-like states, mereologically structured.
- Truthmaking: exact (wholly relevant) and inexact (partially relevant) truthmaking relations.

The first component is shared by both kinds of theory, but while inexact truthmaker semantics treats inexact truthmaking as the fundamental semantic relation, exact truthmaker semantics treats exact truthmaking as fundamental.

Fine shows that exact truthmaker semantics yields a plausible semantics for classical propositional logic, one very similar to that described by van Fraassen (1969).

A model is a triple $\langle S, \sqsubseteq, |\cdot|\rangle$, where S is the set of states, $\sqsubseteq$ is the part-whole relation on S, and $|\cdot|$ is a valuation function mapping each atomic sentence to a pair (V, F) of subsets of S—the sentence's exact verifiers, V, and its exact falsifiers, F. We will write the function that takes an atomic sentence to its set of exact verifiers $|\cdot|^+$, and to its set of exact falsifiers $|\cdot|^-$. And now we can define exact verification and falsification for any sentence, where s, t and u are states, and p and q are sentences, and r is an atomic sentence:

[8] There is also loose falsification, which only requires incompatibility with the sentence's truth.

(i)$^+$	$s \Vdash_e r$	iff $s \in \|r\|^+$
(i)$^-$	$s \dashv\!\!\mid_e r$	iff $s \in \|r\|^-$
(ii)$^+$	$s \Vdash_e \neg p$	iff $s \dashv\!\!\mid_e p$
(ii)$^-$	$s \dashv\!\!\mid_e \neg p$	iff $s \Vdash_e p$
(iii)$^+$	$s \Vdash_e p \wedge q$	iff $t \Vdash_e p, u \Vdash_e q$, and $s = t \sqcup u$
(iii)$^-$	$s \dashv\!\!\mid_e p \wedge q$	iff $s \dashv\!\!\mid_e p$ or $s \dashv\!\!\mid_e q$
(iv)$^+$	$s \Vdash_e p \vee q$	iff $s \Vdash_e p$ or $s \Vdash_e q$
(iv)$^-$	$s \dashv\!\!\mid_e p \vee q$	iff $t \dashv\!\!\mid_e p, u \dashv\!\!\mid_e q$, and $s = t \sqcup u$

In English: negations are verified by the unnegated sentence's falsifiers, and falsified by its verifiers; conjunctions are verified by fusions of verifiers of each conjunct, and falsified by falsifiers of either conjunct; and disjunctions are verified by verifiers of either disjunct, and falsified by fusions of falsifiers of each disjunct. For exact verification, this all seems right.

And from here we can expand in various directions. We can extend the framework to give a semantics to a quantificational language, for example, or a language with modality. But for our purposes, for now, this is enough of a backdrop to consider whether something like this exact truthmaker framework is preferable, for foundational purposes, to a framework that makes primitive use of inexact verification.

2 The Argument for Exact Truthmaking

Fine argues that we should take exact truthmaking, rather than inexact truthmaking, to be primitive. The aim of his argument is to show that exact truthmaker semantics is more powerful than a semantics built on inexact truthmaking—anything the latter can do, the former can do better. Here's the argument, as I understand it.

The Power Argument for Exact Truthmaking

(I) The components of inexact truthmaker semantics (standard situation semantics) can be successfully defined using resources from exact truthmaker semantics.

∴ (II) Anything that can be done in the former can be done in the latter.

(III) There are some interesting things that can be done in exact truthmaker semantics that can't be done in inexact truthmaker semantics.

∴ (IV) Exact truthmaker semantics is interestingly more powerful than inexact truthmaker semantics.

∴ (V) For foundational purposes, we should use exact truthmaker semantics instead of inexact truthmaker semantics.

Inferring (II) from (I) is based on the assumption that a successful definition of some theoretical notion out of others will preserve all of the theoretically relevant properties of the originally undefined notion. To keep this inference uncontroversial, we can stipulate that this is the sense of 'successfully defined' used in (I). Similarly, I think we should treat the inference to (IV) from (III) and (II) as unproblematic—more or less from the definition of 'interestingly more powerful'. The move from (IV) to (V) requires a tacit (normative) premise that we should prefer, at least for foundational purposes, theories which are interestingly more powerful. This is not unchallengeable, I suppose, but nor should it be controversial. It seems to be assumed in many cases of theoretical advance where a new theory subsumes an old one. One caveat is that what is *interestingly* more powerful is very much open to interpretation, and sensitive to, well, one's interests. So one background assumption is that our interests in semantic theorizing at least have large overlap and that it's not impossible to recognize when some increase in a framework's power is relevant to those interests or not.

What is most important to whether this argument succeeds, then, is the truth of (I) and (III). But before getting into Fine's defenses of them, we should emphasize a few things about the conclusion of this argument.

The first thing to note is that the conclusion is a comparative one; the "instead of" is crucial. Unsurprisingly, Fine does not have an argument that establishes that his semantic theory is the final semantic theory, incapable of being bettered by future theoretical advances. Normally one doesn't take oneself to have reached the end of inquiry. Rather, the Power Argument is meant to show that, compared to one of its main competitors, a truthmaker semantics that treats inexact truthmaking as primitive, exact truthmaker semantics has a better claim to be used as a foundational theory.

Second, it is only directly comparing it to *one* alternative. This argument doesn't say anything directly about how exact truthmaker semantics compares to possible worlds semantics, for example. In fact, an analogous argument for using exact (or inexact) truthmaker semantics rather than possible world semantics can be made.[9] However, in the present paper, we will not concern ourselves with that argument, but instead focus on the more in-house contest between varieties of truthmaker semantics.

And third, the conclusion is about which we should treat as the foundational theory. This leaves open the possibility that there are some applications for which the foundationally superseded theory should be used. But in such cases, we should view this use as being ultimately able to be cashed out in terms of exact truthmaker semantics. (Again, it's useful to compare this to how we think of set theory's relation to other branches of mathematics, or perhaps to contemporary physical theories' relations to Newtonian mechanics).

So much for what the argument is about. Next: Fine's defenses of (I) and (III).

2.1 Defining Inexact Truthmaking

Obviously, the most direct way to show that one notion is definable in terms of others is to give a definition of that notion in terms of the others. This is just what Fine does in order to establish (I).

The only difference in the basic components of exact truthmaker semantics and inexact truthmaker semantics is that one makes primitive use of exact verification (and falsification) and the other makes primitive use of inexact verification (and falsification). Thus to show that the components of inexact truthmaker semantics can be defined from those of exact truthmaker semantics, it is sufficient to show how to define inexact truthmaking (and falsehoodmaking). Here is Fine's definition of inexact truthmaking, in terms of exact truthmaking.

> ... we may take a state to inexactly verify a given statement just in case it contains a state that exactly verifies the statement; the inexact verifiers of statement are simply those that contain exact verifiers.
>
> Fine (ms[e], p. 4); see also Fine (forthcoming, p. 10)

Or, to put it in symbols, for any state s and any sentence A:

[9] Fine himself makes it in Fine (ms[e], pp. 3–4), among other places. And Perry (1986, p. 106) makes remarks which are suggest a similar argument in favor of old-fashioned situation semantics over possible world semantics.

$$s \Vdash_i A \quad =_{\text{df}} \quad \exists s'(s' \sqsubseteq s \wedge s' \Vdash_e A)$$

This is intuitive. As Fine puts it, it is to "take literally the idea that inexact verification is partial verification, verification by a part" (Fine, ms[e], p. 4). And we can see that it works for a couple simple cases.

Recall the states, p, of Paris's being a national capital, and b, of Buenos Aires being a national capital. We said that $p \Vdash_i (1)$ and $p \sqcup b \Vdash_i (1)$, but $b \nVdash_i (1)$. Given that $p \Vdash_e (1)$, this is just what the above definition predicts, since $p \sqsubseteq p$ and $p \sqsubseteq p \sqcup b$, but $b \not\sqsubseteq p$. So, at least with these cases, this definition of inexact truthmaking gets things right.

And presumably, though Fine leaves it implicit, we could make an analogous definition for inexact falsification in terms of exact falsification.

$$s \dashv\mid_i A \quad =_{\text{df}} \quad \exists s'(s' \sqsubseteq s \wedge s' \dashv\mid_e A)$$

A state inexactly falsifies a sentence if it contains an exact falsifier of the sentence. And again, this works for simple cases. For example, t, Toronto's not being a national capital is an inexact falsifier of (4), as is $t \sqcup p$. This is what our definition of inexact verification in terms of exact verification predicts, given that $t \dashv\mid_e (4)$, $t \sqsubseteq t$, and $t \sqsubseteq t \sqcup p$.

From these considerations we can tentatively conclude that these definitions are successful. It might turn out that for some more complicated cases, these definitions fail. But since they have some intuitive appeal (in connecting the partial relevance of inexact verification to whole relevance of a part), and work for the basic cases we've considered, the burden is on the proponent of inexact truthmaker semantics to come up with the problem cases. And until they do, it seems warranted to conclude that the definition succeeds.

So it seems that we have a successful definition of inexact verification and falsification from resources available in exact truthmaker semantics, which is enough to show (I), which is enough to show (II). Apparently, then, exact truthmaker semantics is *at least* as powerful as inexact truthmaker semantics.

2.2 Greater Power

Now all that's left to do to fill out the Power Argument for Exact Truthmaking is to show that exact truthmaker semantics is *more* powerful than inexact truthmaker semantics. That is, what we need is a is a defense of

(III). Again, there's a simple way to show that there is something that one theory can account for but another can't: give an example! And this is what Fine does.

Fine argues that exact truthmaker semantics can, but inexact truthmaker semantics cannot, distinguish truthmakers of A and logically equivalent $A \vee (A \wedge B)$.

These sentences will differ in exact truthmakers. Suppose $a \Vdash_e A$, $b \Vdash_e B$, and that b is irrelevant to the truth of A. Then a but not $a \sqcup b$ will be exact truthmakers for A. However, *both* a and $a \sqcup b$ will be exact truthmakers for $A \vee (A \wedge B)$, since any truthmaker of a disjunct will be a truthmaker for the disjunction, and $a \Vdash_e A$ and $a \sqcup b \Vdash_e A \wedge B$. So $A \vee (A \wedge B)$ has an exact truthmaker that A doesn't.

These sentences will have the same inexact truthmakers, though, since, through having a as a part, both a and $a \sqcup b$ will be inexact truthmakers for both sentences.

We can summarize the points above with these charts:

	A	$A \vee (A \wedge B)$
a	✓	✓
$a \sqcup b$		✓

Table 1: Exact Verifiers

	A	$A \vee (A \wedge B)$
a	✓	✓
$a \sqcup b$	✓	✓

Table 2: Inexact verifiers

One way the fan of inexact truthmaker semantics might reply to this is by granting that she can't make this distinction, but arguing that it is an *unimportant* distinction to be able to make, so the extra power exhibited here by exact truthmaker semantics is superfluous. This is not an issue that we can go into in any detail here, but I think this is not a promising avenue for the inexact truthmaker semanticist to pursue. I agree with Fine that it *is* important that we be able to distinguish between truthmakers for these, especially for proper treatment of counterfactuals and imperatives.

A better way of resisting this argument for (III), I think, is to first point out that it is not conclusive. Fine's observations merely show that a completely flat-footed application of inexact truthmaker semantics is insufficient to capture the distinction between A and $A \vee (A \wedge B)$. This leaves it open whether there is some more complicated way to capture the distinction using inexact truthmaking. If some such way could be found, the inexact truthmaker semanticist can defuse this example of Fine's. This would, however, leave it open for (III) to be shown by some other example.

More ambitiously, the inexact truthmaker semanticist might observe the following corollary of (III): it can't be that the components of exact truthmaker semantics can be constructed using the resources of inexact truthmaker semantics. (Since if they could be, inexact truthmaker semantics could do anything that exact truthmaker semantics can do, so exact truthmaker semantics could not be more powerful). If she could go on to show that this corollary is false—by successfully defining exact verification and falsification, for example—she would thereby show (III) itself to be not merely unestablished, but false.

Fine considers a couple attempts by situation semanticists to define, using inexact truthmaking, something "to do the work of exact verification", but thinks that "all such attempts are doomed to failure"(Fine, forthcoming, p. 9). If he's right about this, then our suggested reply on behalf of the inexact truthmaker semanticist is similarly doomed. Let us examine, then, the problem Fine thinks they have.

As Fine sees it, there are two kinds of constructions from inexact truthmakers that situation semanticists have used to approximate the notion of exact truthmaking.

The first approximation is through use of minimal situations.

$$s \text{ is } p\text{-minimal} \quad =_{\text{df}} \quad (s \Vdash_i p) \wedge \forall s'(s' \sqsubset s \supset s' \nVdash_i p)$$

The minimal situation is a 'smallest' inexact truthmaker for a sentence—a state that inexactly verifies the sentence without having any proper parts that verify it.[10]

The second approximation is using quasi-minimal situations, elaborations of the minimal situation idea. This includes Kratzer's notion of exemplification, which was developed in Kratzer (2002) in order to avoid a bug in the concept of minimal situations.

$$s \text{ exemplifies } p \quad =_{\text{df}} \quad s \text{ is } p\text{-minimal} \vee \forall s'(s' \sqsubseteq s \supset s' \Vdash_i p)$$

That is, s is p-minimal or every part of s inexactly verifies p. The primary advantage of exemplification is that states that have gunky structures with

[10]Minimal situations have been prominent in the situation semantics literature since Berman (1987) and Heim (1990) used them in accounts of quantificational adverbs and donkey anaphora.

all of the parts inexactly verifying a sentence can still be exemplifiers for that sentence, even though there can be no minimally verifying state. This may be important for getting the semantics of mass terms and imperfectives right, since they seem to involve just such gunky structures.[11] We can think of exemplifying states as ones that homogeneously verify the sentence—either all of its parts are required for inexact verification or each of the parts themselves verify the sentence.

Exemplifiers and minimal situations will have no irrelevant parts relative to the truth of the sentence they are exemplary of or minimal for, and so will be wholly relevant to the truth of that sentence. Thus we might expect that exact truthmaking can be straightforwardly defined in terms of one of these notions, since it is like inexact verification except requires whole relevance. The natural thing to try is

$$s \Vdash_e p \quad =_{\text{df}} \quad s \text{ is } p\text{-minimal}$$

or

$$s \Vdash_e p \quad =_{\text{df}} \quad s \text{ exemplifies } p.$$

And this does keep $a \sqcup b$ from verifying A, which is what was keeping simple inexact verifiers from being able to distinguish the truthmakers of A and $A \vee (A \wedge B)$, as we saw above. But unfortunately, as Fine observes, it also keeps it from verifying $A \vee (A \wedge B)$. $a \sqcup b$ is not $(A \vee (A \wedge B))$-minimal since it has a proper part, a, which inexactly verifies the sentence. And it doesn't exemplify $A \vee (A \wedge B))$ since it's not $(A \vee (A \wedge B))$-minimal and it has a part, b, that does not inexactly verify $A \vee (A \wedge B)$.

	A	$A \vee (A \wedge B)$
a	✓	✓
$a \sqcup b$		

Table 3: (Quasi-)Minimal verifiers

So we still can't distinguish A and $A \vee (A \wedge B)$ in terms of inexact truthmakers or anything yet defined from them.

I agree with Fine that these suggested definitions are failures, for the reason he provides. I do not think, however, that this is the end of the story,

[11] See the mud example from Kratzer (2002, pp. 166–167).

since again, it only rules out a couple of rather simple definitions of exact truthmaking in terms of inexact truthmaking. However, it is important to recognize that these definitions don't work, and it doesn't seem that there is anything else available in the literature that would work. So at this point, if the inexact truthmaker semanticist wants to claim that she can define exact truthmaking, her work is cut out for her.

In this section we reviewed Fine's argument for favoring exact over inexact truthmaker semantics. It's a strong argument with an interesting conclusion. However, I believe it fails. In the next section we will see why.

3 Why it Fails

Fine's argument for exact over inexact truthmaking, we said, rests on two premises: that inexact truthmaking can be defined in terms of exact truthmaking, and that there are things that exact truthmaking can do that can't be done with inexact truthmaking. I will argue that both of these premises are false. Let's start with (III), where we left off.

3.1 Defining Exact Truthmaking, or, Why (III) is False

As noted above, the argument that exact truthmaking is stronger than inexact truthmaking could be defused if there were a definition of exact truthmaking in terms of inexact truthmaking. The problem with that strategy was that Fine had gone through the obvious options and shown them to fail to capture exact truthmaking. But as I said then, this is not the end of the story, since it doesn't exhaust the space of possible definitions. Let's try to tell some more of that story here.

I think there is a way to define exact verification and falsification using the resources of inexact truthmaker semantics. The definition makes use of exemplification, though not by simply saying that exact truthmaking just *is* exemplification. The first part of the definition goes like this. Where s, t, and u are states, p and q are sentences, and r is an atomic sentence,

(d.i)$^+$	$s \Vdash_e r$	$=_{\text{df}}$	s exemplifies r
(d.iii)$^+$	$s \Vdash_e p \wedge q$	$=_{\text{df}}$	$t \Vdash_e p, u \Vdash_e q$, and $s = t \sqcup u$
(d.iv)$^+$	$s \Vdash_e p \vee q$	$=_{\text{df}}$	$s \Vdash_e p$ or $s \Vdash_e q$

Clearly, this is incomplete. It doesn't yet say anything about exact falsification, or about exact truthmaking of negated sentences. To complete the definition, we will need to introduce a negative counterpart of exemplification. But what we have so far is enough to see how the definition works: it uses exemplification for the atomic case and defines the rest recursively from that, mimicking the original definition of exact truthmaking for complex sentences from exact truthmakers of atomic sentences.

What we already have is also enough to see that this definition will not fall prey to the original problematic case for inexact truthmaker semanticists: distinguishing A and $A \vee (A \wedge B)$. For suppose a exemplifies A, b exemplifies B, and $b \nVdash_i A$. Then, by the definition above, $a \Vdash_e A \vee (A \wedge B)$ and $a \sqcup b \Vdash_e A \vee (A \wedge B)$, but while $a \Vdash_e A$, $a \sqcup b \nVdash_e A$. It works just as it did with primitive exact truthmaking.

More generally, it's clear that if the definition for exact truthmaking of atomic sentences is right, a definition along these lines will work just as well as the exact truthmaker semanticist's account for the truthmakers of any complex sentences. The only place where difficulties might arise, then, is in the base clause, which defines exact truthmaking of atomic sentences as exemplification. But so far we have not seen any challenges to the claim that exemplification and exact truthmaking are the same for atomic sentences. There are, however, some problematic cases. We'll address them after we finish the definition.

To complete the definition, we define 'negxemplification', the negative counterpart of exemplification.

$$s \text{ negxemplifies } p \quad =_{\text{df}} \quad ((s \dashV_i p) \wedge \forall s'(s' \sqsubset s \supset s' \not\dashV_i p)) \vee \forall s'(s' \sqsubseteq s \supset s' \dashV_i p)$$

This is just the same as exemplification, with $\dashV_i$'s swapped for $\Vdash_i$'s. So: the state is either a minimal inexact falsifier of the sentence (it inexactly falsifies it and none of its proper parts do) or all of its parts inexact falsify the sentence.

With a negative counterpart of exemplification in hand, we can give the rest of the definition, in the same manner as before.

(d.i)$^-$	$s \dashV_e r$	$=_{\text{df}}$	s negxemplifies r
(d.ii)$^+$	$s \Vdash_e \neg p$	$=_{\text{df}}$	$s \dashV_e p$
(d.ii)$^-$	$s \dashV_e \neg p$	$=_{\text{df}}$	$s \Vdash_e p$
(d.iii)$^-$	$s \dashV_e p \wedge q$	$=_{\text{df}}$	$s \dashV_e p$ or $s \dashV_e q$
(d.iv)$^-$	$s \dashV_e p \vee q$	$=_{\text{df}}$	$t \dashV_e p, u \dashV_e q$, and $s = t \sqcup u$

This completes the definition. It uses only notions available in inexact truthmaker semantics and, I submit, it will successfully handle exact truthmaking and falsehoodmaking. If this is right, then it can't be that exact truthmaker semantics can do more than inexact truthmaker semantics; (III) is false.

There are two objections to this conclusion that I'd like to discuss. The first objection is to do with the strategy of defining exact truthmakers in this way. Clearly, it is derivative, relying on the work of exact truthmaker semanticists (van Fraassen and Fine). One might object, then, that this procedure is pointless. If you're going to copy the work of the exact truthmaker semanticists, why not just join them?

I agree that from what we've seen so far, there's not much reason to resist going for exact truthmaker semantics as foundational. But that's not what we're trying to show (yet). What we're trying to show is that the inexact truthmaker semanticist *need not*, contra the Power Argument for Exact Truthmaker Semantics, leave the comfort of inexactness to do all the work of exact truthmaking. So I think this first objection to use of the above definition of exact verification and falsification isn't successful.

A second, better objection to the definition is to challenge whether it works in the atomic case. There are some seriously problematic cases for exemplification and minimal situations that are, as far as a propositional logic should be concerned, atomic. Take, for example, (5).[12]

(5) There are infinitely many stars.

This seems to have no minimal state or exemplifier. For consider some arbitrarily ordered infinite collection of stars that play a role in the truthmaking state. Might the state of all these being stars be an exemplifier of (5)? Take every other star. This gives us another infinite collection of stars that is a proper part of the first collection, so we'd expect the state of their being stars to inexactly verify (5) and be a proper part of the original state. So the first state seems not to have been minimal. But nor is every part of the original state a truthmaker for (5). Consider some selection of five of the stars from the original collection. The state of these being stars seems like it should be a part of the original state, yet it does not inexactly verify (5). That such examples are problematic for minimality and exemplification is well known, but as far as I know they have not yet been dealt with

[12]This example is from Kratzer (2002, p. 171).

adequately.[13]

However, I think the inexact truthmaker semanticist can deal with them at least as well as the exact truthmaker semanticist can, again by taking a leaf from the exact truthmaker semanticist's book.

Let's begin by considering how the exact truthmaker semanticist can deal with the truthmaking for a simple existential sentence, (6).[14]

(6) There is a star.

Here is what Fine (forthcoming, pp. 11–12) suggests. First, we introduce predicates ($F, G, \ldots$) and individual constants ($a_1, a_2, \ldots$) into the language and a domain D of individuals ($\mathbf{a_1}, \mathbf{a_2}, \ldots$) into the model. The valuation function will now map an n-place predicate together with a sequence of n individuals to its exact verifiers and falsifiers. So $|\text{is-a-star}(a_1)|^+$ will be the set of states of a_1's being a star. And from here all of the truth-functions can be treated exactly as before.

Fine proposes that we treat the existential quantification $\exists x\phi(x)$ as a (possibly infinite) disjunction of statements ascribing the relevant property to each individual of the domain: $\phi(a_1) \vee \phi(a_2) \vee \ldots$ So $s \Vdash_e$ (6) iff $s \Vdash_e \phi(a_1)$ or $s \Vdash_e \phi(a_2)$, or ...

Ultimately, we'll want a way to extend this to a all generalized quantifiers, but for now I'll just sketch one plausible way of giving an exact truthmaker semantics for "infinitely many".

$$\begin{aligned} s \Vdash_e \text{“There are infinitely many } \phi\text{'s”} \quad \text{iff} \quad & s = t \sqcup u \sqcup \ldots \\ & \wedge (t \Vdash_e \exists x\phi(x) \wedge u \Vdash_e \exists x\phi(x) \wedge \ldots) \\ & \wedge \{t, u, \ldots\} \text{ has infinitely many members.} \end{aligned}$$

That is, s is a fusion of infinitely many states that each exactly verify $\exists x\phi(x)$.

[13] See Kratzer (2002, p. 171) and Armstrong (2004, pp. 21–22), who attributes this kind of example to unpublished work from 1995 by Greg Restall. Kratzer suggests that we handle (5) by claiming the proposition expressed by it is not one that is true in any situation in which there are infinitely many stars (Kratzer thinks of situations as at least sometimes being spatiotemporally extended, so it makes sense to think of stars being parts of or contained in situations), but instead one such that it "contains all the stars in the world of [it] and there are infinitely many many of them". This seems to me ad hoc and not very plausible. Is (5) really not true in situations that contain infinitely many stars but not all of the stars in the world? Why not?

[14] We will not address falsification for it, since that gets us into tricky issues about how to deal with truthmakers for universal generalizations, and I don't think these extra complications are relevant here.

There are various issues to be worked out here (in particular, we would need a satisfactory account of state individuation), but I think this is an acceptable start of an account of sentences like (5). It says that $s \Vdash_e$ (5) iff s is the fusion of infinitely many states that exactly verify (6). So exact truthmaker semantics seems not to have trouble making sense of sentences like (6).

Fortunately, there's nothing in this account that the inexact truthmaker semanticist cannot mimic. The strategy is the same as it was for our original definition: substitute in 'exemplification' for 'exact verification' in the atomic case, but treat everything else in exactly the same way. So all we need to alter about the above story is that in the atomic case, $s \Vdash_e \phi(\alpha) =_{\mathrm{df}} s$ exemplifies $\phi(\alpha)$. And from there we define the exact truthmakers of existential quantification using disjunction and the exact truthmakers of "infinitely many" using existential quantification, as before. This means that so long as exemplification works for the atomic case, the inexact truthmaker semanticist can specify appropriate exact truthmakers for (5). But there's nothing particularly problematic about finding exemplifiers for "a_1 is a star", nor atomic formulae in general. Thus, once we revise our definition to identify exact truthmakers with exemplifiers only for atomic sentences of a quantificational language, it will not be problematic that (5) has exact truthmakers but no exemplifiers.

Thus, though the second objection is more serious than the first, ultimately I think it can be answered. And so, pending further problems, I conclude that there is a successful definition of exact verification and falsification available to the inexact truthmaker semanticist, and, on that basis, that premise (III) of the Power Argument for Exact Truthmaker Semantics is false.

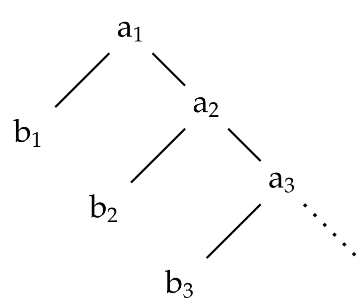
The inexact truthmaker semanticist, then, should welcome the various innovations relying on exact truthmaking, since exact truthmaking is already available to her.

3.2 Inexact Truthmakers without Exact Truthmakers, or, Why (I) is False

The other major premise in Fine's argument for exact truthmaker semantics over inexact truthmaker semantics was that everything that is needed to do inexact truthmaker semantics can be constructed from what's available to the exact truthmaker semanticist. Fine argued for this by providing a definition of inexact truthmaking. As we've seen, Fine's definition of inexact verification—a state inexactly verifies a sentence if it has an exact verifier of the sentence as a part—is plausible, and works for several cases. This does not guarantee, however, that it works for all cases.

In fact, I think there are some cases for which it fails. There are cases where there are inexact verifiers without exact verifiers as parts. The kind of case I have in mind is one where every part of an inexact verifier of a sentence has parts irrelevant to the truth of the sentence, so cannot have an exact verifier.

Imagine, for example, a certain kind of gunky mixture with the following structure.



Let's call this 'the Mixture'. Every bit of a-stuff in the Mixture has a b-part and an a-part. For concreteness, the b-parts can be taken to be atomic, though it doesn't matter, so long as they don't contain any a-parts that themselves don't contain b-parts.[15]

Supposing that the Mixture exists, and supposing we take states to be the objects (a_1, b_1, etc.) themselves,[16] what parts of the Mixture are the exact verifiers for (7)?

(7) There is some a-stuff.

[15]This means that another kind of gunky mixture that would work as a counterexample is one where there are two substances which can blend in such a way that every part of the blend is itself a blend of each of the substances. This is similar to the kind of blending discussed in Nolan (2006) which, on his reading, is an idea that goes back to Chrysippus. That said, we cannot allow, as Nolan (2006, p. 172) seems to, that the original 'pure' substances (which don't have parts that involve the other substance) are themselves parts of the blend.

[16]If you are thinking, "But that's not what states are!", hold that thought. This will come up as an objection in a moment, and we'll revise the case to accommodate it.

It seems that none of them are. The obvious candidates for truthmakers of (7) are the a-parts: a_1, a_2, ... But none of these can be *exact* truthmakers, since any a_n has a part, b_n, that is irrelevant to the truth of (7). And exact truthmakers must be wholly relevant to the statements they verify.

Nevertheless, there are plenty of inexact verifiers (e.g, a_1). The fact that they have irrelevant parts does nothing to keep them from being inexact verifiers. But then there are inexact verifiers, like a_1, that don't have any exact verifiers as parts. If this right, then Fine's definition of inexact verification fails. What it says is a necessary condition of inexact verification is not actually a necessary condition. And I see no alternative to Fine's suggested definition that does any better. Thus I tentatively conclude that the central component of inexact truthmaker semantics cannot be successfully defined using resources from exact truthmaker semantics, that (I) of the Power Argument for Exact Truthmaking is false.

There are several objections to this line of reasoning which need to be addressed. One of the objections will require us to modify the case. But before getting to those, it's worth clarifying why it is that there can be no exact verifiers for (7) in this kind of mixture.

It's not that exact verification has a closure condition requiring every part of an exact verifier to be an exact verifier. That exact verification requires whole relevance is not this strong. Rather, whole relevance only requires that each part of the state plays *some* role in making the statement true. A conjunction has fusions of states as verifiers, and it's not that the parts of these fusions must each exactly verify the conjunction, just that they each play some role in its verification. So in the case above, the problem isn't that the a-parts have b-parts that aren't themselves exact verifiers of (7). Rather, it's that they have b-parts that *play no role whatsoever* in verifying the statement. Now onto the objections.

The first objection is that gunk, or at least this kind of gunky mixture, is metaphysically impossible, so we need not worry about cases involving things like the Mixture ever arising.

This objection does not warrant an extensive reply, but let us note first, that it's by no means obvious that the Mixture is impossible, and second, that even if it is impossible, it seems like the kind of impossibility that we can intelligibly talk about, and so presumably semanticists should not ignore it on account of its putative impossibility.

A second objection is that the case of the Mixture, like many others borne of philosophers' imaginations, is so artificial and marginal that they can be ignored by the semanticist as having no linguistic relevance.

I reply that perhaps for most practical purposes of semantic theorizing, this is so (though I have my doubts), but that's not what's currently at issue. The project we're concerned with is a foundational one: which theory is better able to play the role in semantics akin to set theory in mathematics? In a project like this it is much less plausible to disregard strange cases as irrelevant. So long as inexact verification is something we might want to use,[17] we we want it to be something that our foundational theory can express. If we can't get a good definition of it in other terms, this counts in favor of treating it as a primitive. So if examples like the Mixture show that exact truthmaker semantics cannot successfully define inexact truthmaking, this counts against treating exact truthmaker semantics as foundational.[18]

A third possible objection is that I too quickly concluded that the b-parts are irrelevant to the truth of (7), or that I ignored other possible exact truthmakers of (7). We can state this objection as a dilemma. If the b-parts can't be separated out from the a-stuff, at least in principle, then perhaps the b-parts really are playing some active role in the truthmaking of (7), and so the a-parts could be exact truthmakers. On the other hand, if the b-parts can be separated out from the a-stuff, then the pure a-things can be the exact truthmakers of (7).

This objection misses the point of the case. It's not meant to show that there is no possible exact truthmaker for (7). Rather, it's that given some instance of the Mixture, there will be inexact truthmakers of (7) that don't have any exact truthmakers of it as parts.

A fourth objection is that inexact truthmaker semantics has a problem here as well, since this kind of case seems to be one where there is no exemplifier, but I (and other situation semanticists) have suggested that they make use of the notion of exemplification. And if inexact truthmaker semantics can't account for this case, it's no objection to Fine's defense of (I) to show that exact truthmaker semantics can't either.

But again, this is just meant to be a case of inexact without exact truth-

[17] And it is, as Fine happily admits. See Fine's account of counterfactuals: Fine (2012, pp. 236–237) and Fine (forthcoming, pp. 16–17).

[18] We could, perhaps, bite the bullet and use inexact* verification, which we just stipulatively define as Fine defines inexact verification. It's not that the failure to define inexact verification out-and-out disqualifies exact truthmaker semantics, but I take it that this is a real cost.

making. It's not presented as a case where we have some account of the semantics of (7) in inexact truthmaker semantics. Moreover, the fact that there is no exemplifier of (7) is not merely a non-problem, but is also an advantage for the inexact truthmaker semanticist making use of exemplification to define exact truthmaking. That an existential sentence which doesn't have exact truthmakers also doesn't have exemplifiers is something we'd predict on this account. Were it otherwise, something would have been amiss with the definition of exact truthmaking.[19]

The strongest objection to the argument against Fine's definition goes as follows. We should not take states for our semantics of sentences like (7) to be concrete objects. Rather, we should continue to think of them as fact-like entities. And there's no reason to think that the parthood relation between things must be mirrored by the states pertaining to their existence. Once we realize this, we can say that there is the state that a_1 exists, which doesn't itself include all the parts of a_1, or any states corresponding to those parts, and that this is an exact truthmaker of (7). Similarly for the state that a_2 exists, and so on. This makes available all the exact truthmakers we would need to be parts of the inexact truthmakers of (7). So Fine's definition survives unscathed.

Unlike the previous objections, I think this one is pretty compelling. Though there may be room to argue about what sorts of things truthmakers of indicative sentences are, I'm inclined to grant that this objection succeeds as a response to this version of the objection. It does not, however, get to the root of the problem. There is not yet any reason to think that the relevant problematic structure cannot arise within the state space, whatever states end up being. And in such a case, I suspect we will want to say there is inexact verification but no exact verification. Rather than trying to find such a case for indicative statements and their fact-like states, I will argue that we can use the Mixture to cause trouble in the realm of imperatives in a way which, as we will see, avoids this objection. This will require a few words about Fine's truthmaker semantics for imperatives.

In the exact truthmaker semantics of indicatives, we have a state space

[19] That said, there may be a real worry stemming from this kind of case for certain of the other applications of exemplification and minimal situations made by situation semanticists. It would be worth thinking about what happens with, e.g., donkey anaphora or adverbs of quantification in utterances about structures like these. Perhaps revision of standard inexact truthmaker accounts of certain phenomena are in order. This does not, however, pose a problem for inexact truthmaker semantics as a general framework.

$\langle S, \sqsubseteq \rangle$, where we've been thinking of states as fact-like. With imperatives, Fine proposes that instead of a state space, we have an action space $\langle A, \sqsubseteq \rangle$ of the set of (possible and impossible) actions (and parts and fusions of parts of actions), structured by a part-whole relation. Formally, this is just the same structure. And since we don't normally think of imperatives as being true or false, we take $\Vdash_e$ to be to be the relation of exact compliance between a member of A and an imperative sentence, and $\dashV_e$ to be the relation of exact contravention. From here, the accounts of indicative and imperatives look very similar. For example, the exact compliers of the conjunctive imperative $C \wedge D$ will be the fusions of the exact compliers of C and D. This is an advantage of the exact truthmaker semantics framework, that it carries over so directly to imperatives.

For our purposes, one important thing that carries over from the indicative case is the definition of $\Vdash_i$ and $\dashV_i$, which in the imperative case will be inexact compliance and contravention, and could be given in terms of $\Vdash_e$ and $\dashV_e$ in the same way. An inexact complier of a command is an action from A that has an exact complier of that command as a part.

With this in mind, consider the imperative:

(8) Ingest some a-stuff.

Now take an action of the addressee's eating the Mixture. It seems that we have the same kind of structure as above. In this case, there seem to be actions that inexactly comply with (8), but none that exactly comply with it, since every act of ingesting a-stuff by the addressee has as parts ingestion of b-stuff. This would serve to refute the definition of inexact compliance in terms of exact compliance.

The point isn't that there couldn't be ingestion of a-stuff without ingestion of b-stuff; I'm happy to allow that there are *some* possible or impossible exact compliers with the command. Nor is the point that inexact compliance is what is important in the case of imperatives and permissives; I'm happy to allow that there are contexts in which someone's eating the Mixture in response to an authority's utterance of (8) is a failure to permissibly comply.

Rather, the point is simply that the notion of inexact compliance is clearly satisfied in this case, yet there are no exact compliers for the inexact compliers to have as parts. So Fine's definition of the inexact in terms of the exact fails. And this time, the objection that I conceded to be successful in our first example does not apply, at least not without giving up one of the central features of Fine's exact truthmaker semantics for imperatives. This is because the kinds of things that should play the role of states in the semantics of imperatives are actions, and here it seems we can't say that the there might be an act of ingesting a_1 which doesn't have, as a part, ingestion of a_2 and b_1.[20]

I conclude, then, that Fine's proposed definition of the inexact in terms of the exact is unsuccessful and so, if there is no better definition available, (I) is false.

Before moving on, it is worth raising the question: why did the definition of inexact verification fail? If my objection works, we can see *that* the definition fails, but we don't yet have a good explanation of *why* it did. After all, inexact truthmaking was introduced as a kind of truthmaking that requires the state to be partly relevant to the truth of the statement it verifies. How could it be wrong, then, that an inexact truthmaker is one that contains an exact truthmaker as a part that makes it *part*ially relevant? The answer is that the partial relevance should be spelled out in terms of inexact, rather than exact, truthmaking. A state can be an inexact verifier of a sentence by having a part that is itself an *inexact* verifier of the sentence. This allows for inexact truthmakers with structures like the Mixture, since there's no need to ever get to parts that are wholly relevant to the truth of the statement, or to the compliance with the command.

4 The Argument for Inexact Truthmaking

I've argued that Fine has things backwards, that exact truthmaking can be defined from inexact truthmaking, but not vice versa. If this is right, notice that not only does the power argument for exact truthmaking fail to go through, but the very same argument, *mutatis mutandis*, can be used to argue for the opposite conclusion: that inexact truthmaker semantics,

[20] We can make the same move for indicatives if we follow Moltmann (forthcoming, pp. 13 ff.) in taking events to be the truthmakers of 'action' sentences like

(i) Sandy ate some a-stuff.

If Sandy ate the mixture, and the truthmakers for that are supposed to be events, there would be inexact without exact truthmakers.

rather than exact truthmaker semantics, should be considered fundamental. Fine's argument can be turned on its head.

The Power Argument for Inexact Truthmaker Semantics

(I′) The components of exact truthmaker semantics can be successfully defined using resources from inexact truthmaker semantics.

∴ (II′) Anything that can be done in the former can be done in the latter.

(III′) There are some interesting things that can be done in inexact truthmaker semantics that can't be done in exact truthmaker semantics.

∴ (IV′) Inexact truthmaker semantics is interestingly more powerful than exact truthmaker semantics.

∴ (V′) For foundational purposes, we should use inexact truthmaker semantics instead of exact truthmaker semantics.

We discussed the form of the argument and meaning of its conclusion in the beginning of Section 2; the same observations apply here. (I′) was defended in Section 3.1, (III′) in Section 3.2.

It is possible, of course, that the reader is unpersuaded by my case for one or the other of the premises; this would leave (V′) unestablished. I'd like to observe what other conclusions she could draw.

Suppose we accept (I′), but not (III′). This would mean we take inexact truthmaker semantics to be at least as powerful as exact truthmaker semantics, but not more powerful. In such a scenario, it seems to me, we could treat either inexact or exact truthmaking (or both) as primitive. If the reason inexact truthmaker semantics is not more powerful is because there *is* some way of defining its components from those of exact truthmaker semantics, then we are in a familiar situation where there are multiple sets of interdefinable primitives (cf. the interdefinability, with $\neg$, of $\Box$ and $\Diamond$). Which we decide to use will depend on convenience or personal preference, and the question of which is *really* fundamental will be idle, if not meaningless, though we may hope for some deeper, unifying theory which makes neither inexact nor exact truthmaking primitive.

Suppose we accept (III′), but not (I′). This would mean that neither of the theories can do the work of the other. At least for foundational purposes, it seems that the best response would be to treat both exact and inexact verification (and falsification) as primitives, combining exact and inexact truthmaker semantics. I do not see any real theoretical problem with doing this, though it is less elegant than starting with one kind of truthmaking and constructing the other. Again, we might accept this for the moment and hope for some deeper theory which could be used to define both notions.

5 Conclusion

As I said at the outset, I'm no counterrevolutionary. I suspect the notion of exact truthmaking will indeed be central to making important advances in semantics. On the matter of applying it in the practice of semantic theory building, I encourage semanticists: full steam ahead!

Nevertheless, I think the relation of exact truthmaking may be constructed from its more familiar inexact counterpart, and I doubt that inexact truthmaking can be successfully constructed from the exact truthmaking and the surrounding apparatus. Thus on the matter of what the fundamental components underlying our semantic theories are, I counsel partial restraint.[21] Deep down, I maintain, it's all inexact.

[21] Partial because the move to replace possible worlds with states or situations is, as far as I am concerned, not to be impeded.

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