Truthmaker Semantics, Disjunction, and Fundamentals

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Abstract: There are two dimensions to Fine's truthmaker semantics. One involves a claim about the nature of propositions: propositions are not structural and nothing but sets of their possible truthmakers, and the other talks about the relation between truthmaking and Boolean operations. In this paper, I show that a claim by Fine in the latter dimension—that truthmaking is distributed over 'or'—faces a counterexample. I will then go on to argue that one possible way to do away with the counterexample is to restrict truthmakers to fundamentals, namely entities that are not grounded in anything else. This would, nevertheless, pose a problem for the first dimension of truthmaker semantics: certain distinct propositions would fail to be distinct.

Keywords: Truthmaker Semantics; Disjunction; Fundamentals

1. Introduction

Kit Fine has recently proposed a truthmaker semantics (2017a and 2017b). There are two dimensions to this theory, where the first makes a claim about the nature of propositions, i.e. propositions are not structural and nothing but sets of their possible truthmakers (and perhaps their possible and impossible truthmakers). As to the second dimension, he enumerates principles holding between the relation of truthmaking and Boolean operations (conjunction, disjunction, and negation). Fine believes that these principles provide advantages for truthmaker semantics over alternative theories, where these advantages are to yield explanatory reasons for the truth of truthmaker semantics. The following remarks are made before he introduces the relevant principles:

> A good test for any proposed semantical framework is its ability to deal with classical sentential logic; and so let me show how we might give such a semantics within the truthmaker framework. (2017b, 561)

Additionally, Fine repeatedly, often implicitly, refers to relation of truthmaking and disjunction thesis when he discusses applications of truthmaker semantics. For example, when he suggests his theory of subject-matter of statements in terms of truthmaker semantics. (2017b, 571)

Fine distinguishes three interpretations of a truthmaker: loose truthmakers, inexact truthmakers, and exact truthmakers (2017b, 558). For *s* to be a loose truthmaker for *P*, it suffices that necessarily in any possible world in which *s* exists, *P* is true. *s* is an exact truthmaker for *P* if and only if it is a loose truthmaker for *P* and is wholly relevant to the truth of *P*. For *s* to be an inexact truthmaker for *P*, it suffices that it involves something that is an exact truthmaker for *P*. Given that everything involves itself, whatever is an exact truthmaker is also an inexact truthmaker (In Section 3, I will discuss the definition of exact truthmakers in more detail.). Henceforth, whenever I talk about a "truthmaker" I mean an exact truthmaker, unless I specify otherwise.

In this paper, I try to show that a principle proposed by Fine in the second dimension of his semantics is wrong. In particular, I have in mind the principle of distribution of "or" over truthmaking which, as per the common usage in the truthmaking literature (e.g. see Rodriguez-Pereyra 2009), I refer to as the "disjunction thesis."

> **The disjunction thesis:** *x* is a truthmaker for $P \vee Q$ iff *x* is a truthmaker for *P* or *x* is a truthmaker for *Q*. (Fine 2017a, 632)

Fine thinks that this thesis is true when the full domain of propositions is considered. According to Fine terminology, the full domain of propositions will be obtained if these two principles are given up: closure and convexity. The first principle states that fusions of some truthmakers for a proposition are also its truthmakers, and according to the second principle, any entity that is mereologically between two truthmakers for a proposition is a truthmaker for that proposition as well. The scope of this paper is limited to the full domain of propositions. (Fine 2017a, 628) (I will discuss more about these two principles in section 3)

In what follows, I shall try to show that although some counterexamples might be handled with minor modifications of the thesis, there are counterexamples such that, on the face of it, the disjunction thesis cannot do away easily. Then I examine one possible response: we may be able to resolve this problem by accepting truthmaker fundamentalism; i.e., only fundamental entities could be truthmakers. This solution is not acceptable for advocates of truthmaker semantics, since if truthmaker fundamentalism is true, truthmaker semantics would no longer be able to distinguish certain distinct propositions.

2. Minor objections and replies

Obviously enough, the disjunction thesis would be deemed wrong if we believed that there were disjunctive states.[1] For a disjunctive state is, by definition, something that makes a disjunctive proposition true, without making either of its disjuncts true. It seems that Russell was the first to talk about disjunctive states, although he uses the term "disjunctive facts." On Russell's account, there are no such states, since in his logical atomism he is only committed to the existence of states that are required for the truthmaking of true propositions. Nevertheless, a truthmaker for the true disjunct of a true disjunctive proposition is sufficient for making it true (Russell 2010, 39 and 47)

Fine seems, however, to have blocked this way of rejecting disjunctive states. He makes a distinction between two philosophical projects that proceed with truthmaking: a metaphysical project and a semantical project. In the metaphysical project, we seek "to ascertain what it is, on the side of the world," that makes true the proposition we assume as true (Fine 2017b, 556). Here, "ultimate truthmakers" are what we look for. At a more extreme end, in the metaphysical project, only what Fine calls "ultimate truthmakers" count as genuine truthmakers. in contrast, in the semantical project, what we have in mind are "immediate truthmakers" irrespective of whether or not they are ultimate. For this reason, in the semantical project, "superficial" entities might also qualify as truthmakers. The distinction between the two projects is illustrated by Fine's own example: in the metaphysical project, we might look for the ultimate truthmaker for <there is a table>[2] and take it to be "elementary particles" with such and such arrangements. Such considerations are not taken into account in the semantical project, however, as in this project one might say that <there is a table> is made true by a table as an "ordinary" macroscopic object (ibid 557-558).

While Fine does not elaborate on the distinction between ultimate and immediate truthmakers beyond what I have mentioned, I think he has left enough room for further development. The question of whether a truthmaker is real[3], fundamental, or reducible to other things should not be asked when discussing immediate truthmakers. It is sufficient that it ordinarily exists and makes the relevant proposition true. However, what is meant by "ordinarily exists"? Reconsider Fine's own example of an ordinary object. What makes a table an ordinary object? I think the best answer

[1] Following Fine, I refer to truthmakers as "states," but I take it to include anything that can be a truthmaker: objects, events, and things such as this table's being red, etc. (2017b, 560).

[2] <S> means the proposition expressed by the sentence *S*.

[3] "Real" is used in the same sense in which Fine uses it, for example see: (Fine 2009)

is this: because it has a name in our ordinary language or we ordinarily have the relevant concept. In that sense, besides ordinary objects, we can also speak of ordinary properties, such as being expensive, blue, or being a president. Of course, we can ask whether these properties are real, fundamental, abundant, sparse, or ontologically economical to commit to. However, those questions are related to the metaphysical project. It seems that ‘superficial’ objects and properties are associated with ordinary names and predicates. Ordinary states of affairs are constituted by ordinary objects and ordinary properties, so they can be regarded as immediate truthmakers. Ordinary names and predicates are expected to have a close relationship with immediate truthmakers, since in truthmaker semantics, the immediate truthmakers are supposed to provide meaning for ordinary languages. If one can be so generous with truthmakers, what prevents one from allowing disjunctive states to be truthmakers as well? Let me give an example.

Consider the ordinary term of ‘sibling’. If the states that correspond to ordinary concepts can be truthmakers, then it should be admitted that my having a sibling is a disjunctive state that functions as the truthmaker for <I have a brother or I have a sister>, whereas it is not a truthmaker for either of its disjuncts. One might say, for instance, that not my having a sibling, but my having a sister, is the truthmaker for the proposition in question, since having a sibling is grounded in, for example, having a sister. Perhaps such a consideration indicates that having a sibling does not serve as an ultimate truthmaker. Fine would respond, however, this does not prevent it from being an immediate truthmaker. Whether I have a sibling is real, fundamental, or reducible is only relevant to the metaphysical project, and we are now working on the semantic project. In our language, such examples are common. Taking only one example, being born in the 1970s makes disjunctions such as <I born in 1970 or I born in 1971 or … I born in 1979> true but none of its disjuncts.

There is, however, a very simple qualification that could resolve this issue. This might be why Jago, another advocate of truthmaker semantics, defends the following version of the disjunction thesis: a *non-disjunctive* state, *x*, is a truthmaker for $P \vee Q$ iff *x* is a truthmaker for *P* or *x* is a truthmaker for *Q*. (Jago 2018, 179)[4] (emphasizing is mine)

If, as Barker & Jago (2012) hold, negative states exist and can be truthmakers for some truths, there may be another problem with the disjunction thesis. Consider the following negative state: this table’s weight not being equal to 100kg. It seems that state is a truthmaker for <this table is

[4] He adds another phrase to the thesis. See footnote 6.

heavier than 100kg or this table is lighter than 100kg>, but it is not a truthmaker for either disjunct of the proposition.

A proponent of truthmaker semantics would not be affected by this counterexample to disjunctive thesis, since truthmaker semantics does not imply that negative states can function as truthmakers for some truths. As it seems, Fine himself does not believe that negative states are truthmakers, or that they even exist. As an example, in a hypothetical condition in which only the three colors of blue, green, and red exist, Fine takes one of the following two states as the truthmaker for <this table is not red>: this table's being green and this table's being blue, without making any reference to this table's not being red (2017a, 633-634). Perhaps Fine thinks that negative propositions such as <this table is not red> have positive truthmakers. I take two issues with this possible claim by Fine. In the first place, this is not consonant with the distinction he makes between metaphysical and semantical projects. One might well admit that this table's not being red is not the ultimate truthmaker for <this table is not red> or that negative states have no place among fundamental existences, but these considerations were supposed to be out of keeping in the semantical project. In the second place, as has been pointed out by Armstrong, it seems that not all negative truths have positive truthmakers, such as <this sphere is colorless> or <that particle has no mass> (2004, 62-3).

Let me set aside these two problems for now and assume that it is reasonable to reject the existence of negative states or reject their roles as truthmakers or, in line with Jago's proposal and just like disjunctive states, exclude negatives states from the disjunction thesis. If matters were to be settled by adding such epicycles, we might just say that no major problem is involved in this case. But things do not end here.

3. The major problem

I begin by mentioning Read's counterexample to the disjunction thesis and Rodriguez-Pereyra's successful response to it. I will argue later that this debate could provide evidence that my counterexample is not equally vulnerable.

Read (2000) takes the following scenario as a counterexample to the disjunction thesis: consider M as the proposition that a horserace with such and such features is held, P as the proposition that Valentine wins the race, and Q as the proposition that Epitaph wins the race. Suppose that the local circumstances, t_1, "be such as to favor Valentine and Epitaph over others" (*ibid* p. 74). Read thinks that t_1 is a truthmaker for $(M \rightarrow (P \vee Q)$. Suppose that circumstances t_2 is a truthmaker for M. In this case, $t_1 \cup t_2$ (i.e. the fusion of t_1 and t_2) is a truthmaker for $P \vee Q$, but is neither a truthmaker for P, nor that of Q (Read, 2000, p. 74).

In reply, Rodriguez-Pereyra says that $t_1 \cup t_2$ is not a truthmaker for $P \vee Q$ at all. It only guarantees there being a truthmaker for $P \vee Q$ only *in a causal way*:

> [I]n general to causally ensure that there is a truthmaker for a proposition is not the same as being the truthmaker in question. (2006, 967)

$M \rightarrow (P \vee Q)$ indicates a causal necessity, whereas truthmaking requires metaphysical necessity. His example is illustrative: the existence of oxygen and the occurrence of a short circuit (and some other things that I do not mention for the sake of simplification) causally necessitate that a fire will occur, but they are not truthmakers for the proposition that a fire will occur, since there is a possible world in which oxygen and a short circuit occur, but no fire will happen, since that world is governed by different laws of nature. (*ibid*) Similarly, it is possible for Valentine or Epitaph to benefit from favorable circumstances, but neither will win. In the very beginning of the match, both horses may have broken their legs.

Rodriguez-Pereyra points out that Read's example has another flaw. If t_1 and t_2 were truthmakers for, respectively, M and $M \rightarrow (P \vee Q)$, $t_1 \cup t_2$ would be a truthmaker for $(M \& M \rightarrow (P \vee Q))$. Nevertheless, this would not guarantee that $t_1 \cup t_2$ would be a truthmaker for $P \vee Q$, unless this principle were true: if s is a truthmaker for P and $P \rightarrow Q$, s also is a truthmaker for Q. However, this principle could not be true. Hence, if that were the case, any truthmaker for any truth would also be a truthmaker for any necessary truth, since any proposition entails any necessary truth. (*ibid*) [5]
Now I propose my counterexample. Consider the following states:

s_1: in match *m* only $horse_1$, $horse_2$, and $horse_3$ have crossed the finish line.

s_2: in match *m* only $horse_1$ has ranked first.

$s_1 \cup s_2$ is a truthmaker for the following proposition about the horses involved in match *m*:

H: In match *m*, $horse_2$ has ranked last or $horse_3$ has ranked last.

[5] This principle has been the subject of a long debate in the literature. A number of qualifications have been suggested in order to provide a plausible version of this statement, but none of them appear to be successful. The following are only a few of them: (Jackson 1994), (Restall 1996) and (Rodriguez-Pereyra 2006)

(I have the following definitions of "first" and "last" in mind: a horse ranks first in a race if no horse has crossed the finish line before it did, and a horse ranks last in a race if, first, a horse has crossed the finish line before it did, and second, no other horse has crossed the finish line after it did. Therefore, if s_1 and s_2 occur and $horse_2$ and $horse_3$ simultaneously cross the finish line, then both rank last, and H remains true. On the other hand, if all the three horses cross the finish line at exactly the same time, then H will be false. In this case, all the three rank first, and none ranks last. Whenever s_2 occurs, a case such as this will not happen. If you think this is not what "first" and "last" mean in English, then you may articulate H in terms of "first*" and "last*" which are defined as I have defined "first" and "last.")

However, $s_1 \cup s_2$ is a truthmaker neither for $horse_2$ ranking last, nor for $horse_3$ ranking last.

This counterexample involves only metaphysical necessity, not causal necessity. Firstly, H is true for every possible combination of s_1 and s_2. This kind of metaphysical necessity grounds our intuition that $s_1 \cup s_2$ is a loose truthmaker for H. Secondly, unlike Read's counterexample, $s_1 \cup s_2$ do not contain any nomological law. Consequently, Rodriguez-Pereyra's objection— which addresses the causal necessity present in Read's example—does not apply to my counterexample. Further, unlike Read's example, the controversial entailment thesis does not appear anywhere in my example. Therefore, the Rodriguez-Pereyra objections to Read's example do not apply to my counterexample.

Before delving into possible objections to my counterexample, it is worth noting the following point. Fine has pointed out that if we believe that truthmakers are governed by a closure or a convexity condition, then the disjunction thesis will be rendered implausible. Here is how he defines the two conditions:

> Closure: If *s* and *u* are truthmakers fort a proposition, then $s \cup u$ is also a truthmaker for the proposition.
>
> Convexity: If *s* and *u* are truthmakers fort a proposition, then for any *t* that $t \subseteq s$ and $u \subseteq t$, *t* is a truthmaker for *P*. ("$x \subseteq y$" means that *x* is part of *y*, where everything is part of itself.)

Let us begin with closure. Suppose *a* and *b* are two distinct objects. *a* is a truthmaker of <*a* exists> (A), and *b* is a truthmaker of <*b* exists> (B). Thus, according to the disjunction thesis and closure, $a \cup b$ is a truthmaker of $A \vee B$. In this way, on the disjunction thesis, $a \cup b$ is an exact truthmaker of A, or a truthmaker of B. But this is not the case, since a∪b obviously includes things that are, say, irrelevant to A's truth.[6]

Let us now turn to convexity. Suppose *c* is distinct from *a* and *b*, and C is the proposition that <*c* exists> (A and B are as I have defined them in the preceding paragraph). On the disjunction thesis, both *a* and a∪b∪c are truthmakers of A∨(A∧B∧C). Hence a∪b⊆a∪b∪c, and a⊆a∪b is, according to convexity, a∪b is a truthmaker of A∨(A∧B∧C). However, a∪b is neither an exact truthmaker of A since it involves something irrelevant to A, nor a truthmaker of A∧B∧C in that there is something it lacks without which it cannot be a truthmaker (Fine 2017a, 632; note that Fine shows how closure and convexity contradict the disjunction thesis, but the examples are mine).

Having said that, Fine makes it explicit that if we do not assume closure and convexity, which in his terminology means "working within a full domain of proposition," then there will be nothing wrong with the disjunction thesis (2017a, 632). It is the latter claim that is targeted by the above counterexample, in which these two principles are not assumed.

4. Objections and replies

In this section, I grapple with two possible objections against my counterexample.

The first possible objection: this example also draws on negative states. s_1 (in match *m* only $horse_1$, $horse_2$, and $horse_3$ have crossed the finish line) is indicative of a restriction; namely, what has not happened: there was no other horse involved in the match. For this reason, it might be said that this adds nothing over and above the earlier counterexample involving negative states. If we already acknowledge that the problem can be solved by exclusion of negative states from the disjunction thesis, then why not take up the same strategy here?

To begin with, Fine himself endorses the truthmaking capacity of states that are indicative of restrictions. That is, he seems to hold that things in the case of such states are different from those in the case of states such as this table's not being red. In the extension of his theory to quantified sentences, he believes that truthmakers for sentences such as (∀x) Fx or (∀x) (Fx→Gx), respectively, include the state of the totality of realized objects or the state of the totality of realized objects that are F (2017b, 568). These states are also indicative of limitations: there is no realized

[6] In his inclusive semantics, Fine endorses closure and adds the following to the right-hand side of the disjunction thesis: or *x* is a truthmaker for *P*∧*Q*. (2017b, 563)

object beyond these; there are no realized Fs except these. s_1 can also be articulated as follows: $horse_1$, $horse_2$, and $horse_3$ are the totality of horses attending match *m*.

The negative profile of s_1 does not therefore dissuade Fine from acknowledging it as a truthmaker. (There is a restriction and totality in the case of s_2 as well: no other horse has crossed the finish line simultaneously with $horse_1$.)

Even if Fine excludes totality states from the disjunction thesis, then given the major role played by such states in the truthmaking of quantified sentences, he can no longer draw the conclusions he did in his truthmaker semantics by using the thesis, and so he cannot extend its applications to quantified sentences. This is also bad news for his theory.

The second possible objection: one might say that $s_1 \cup s_2$ is not an exact truthmaker for H.

There is no doubt that $s_1 \cup s_2$ is a loose truthmaker for H. Obviously, H is true in every possible world in which $s_1 \cup s_2$ obtains. Now we should examine whether or not $s_1 \cup s_2$ is an exact truthmaker for H.

As far as I am aware, there is no clear definition of the exact truthmaker. In an apparent reasonable definition, state s is an exact truthmaker for proposition P if and only if s is a minimal truthmaker for P. The definition of a minimal truthmaker is as follows: s is a minimal truthmaker for P if and only if s is a truthmaker for P and no proper part of it is a truthmaker for P. (e.g. see: (O'Conail and Tahko 2016, 3). This suggestion is, however, inadequate. In some cases, there is no minimal truthmaker, as shown by Read. Assume that <there are infinite electrons> is true. This proposition could not have a minimal truthmaker. To see this, imagine an infinite number of electrons. This could not be a minimal truthmaker for the relevant truth, since this bunch of electrons minus one also makes that proposition true. As a result, there is no exact truthmaker for some propositions if exact truthmakers are nothing but minimal truthmakers. Thus, Fine's truthmaker semantics fails in its very first step. After mentioning a similar example to Read's, Fine himself acknowledges this and points out:

> "The relevant sense in which an exact verifier is wholly relevant to the statement it makes true is not one which requires that no part of the verifier be redundant but is one in which each part of the verifier can be seen to play an active role in verifying the statement." (2017b, 564)

Thus, when defining exact truthmakers, we must work with the notion of 'wholly relevant', which is imprecise: The definition that I suggest in section 1:

> *s* is an exact truthmaker for *P* if and only if it is a loose truthmaker for *P* and is wholly relevant to the truth of *P*.

Let us to return to the second objection. I think this objection does not work. In the case where a state s is not an exact truthmaker for a truth T, s is wholly irrelevant or contains something not relevant to T. In such a case, the following explanation seems inapplicable: T is true because s is the case. This explanation might be dismissed as not being a good explanation, since it involves unrelated things. On the other hand, it would seem intuitively plausible that H could be explained by $s_1 \cup s_2$. At least *prime facie*, it is not acceptable to say: There is no way that $s_1 \cup s_2$ can explain H, since it has no connection with H or includes some irrelevant to H. Below, I try to show that it is justified to rely on this intuition.

I think it is unlikely for $s_1 \cup s_2$ not to be an exact truthmaker for H. For the purpose of making this claim plausible, I will explore potential sources of irrelevancy where entities are loose truthmakers, but not exact truthmakers, for a given truth; I will then demonstrate that none of these sources can be found in my counterexample."

Oftentimes, a state that is a loose truthmaker for a proposition is not an exact truthmaker for the proposition when the proposition in question is necessary, just as this table is a loose truthmaker for <2 is even>, without being its exact truthmaker. Call it ‘the necessity source of irrelevancy’. Since H is contingent, in my example, this source of irrelevancy is not relevant.

Another source of irrelevancy is the necessity of origin. For instance, Abel is a loose truthmaker for <Adam exists>, but it is not its exact, and maybe even an inexact, truthmaker, because Abel and Adam are two totally distinct objects. The truth of <Adam exists> is not appropriately related to Abel. However, the relation between $s_1 \cup s_2$ and H is not of this sort either.

Furthermore, non-minimalism may lead to irrelevancy. In many cases, an entity is not an exact truthmaker for a truth, since it is not a minimal truthmaker for that truth. For example, the fusion of this table and that chair is not an exact truthmaker for <this table exists>, because that fusion is not minimal truthmaker for that truth: if some part of the fusion is removed, that chair, what is remains is also makes this table exists> true. However, it seems that $s_1 \cup s_2$ is a minimal truthmaker for H. For instance, if we remove s_1 from the fusion, then there is still room for the possibility that another horse, in addition to the three horses, could have been in the race, and would have ranked last. If we remove s_2 from the fusion, there is still room for the possibility that neither $horse_1$, nor $horse_2$, might have ranked last, $horse_1$ alone having ranked last, instead.

The interlocutor might resist, nevertheless. She might acknowledge that although minimality of a truthmaking might often be enough to make it exact, it does not hold across the board. She might make her case by presenting the following compelling example.[7]

s_3: in match *m'* only $horses_1$, $horse_2$, $horse_3$, and $horse_4$ have crossed the finish line.

s_4: in match *m'* only $horse_1$ has ranked first.

s_5: in match *m'* $horse_4$ has ranked last.

Obviously, $s_3 \cup s_4 \cup s_5$ is a loose truthmaker for the following proposition:

H': $horse_2$ has ranked second or $horse_3$ has ranked second.

$s_3 \cup s_4 \cup s_5$ cannot be dismissed as totally irrelevant. Even so, $s_3 \cup s_4 \cup s_5$ seems to include cases that are irrelevant to H'. Which horse has ranked last seems irrelevant to which horse has ranked second. A person standing near the finish line already knows which horse has ranked second before she knows which horse has ranked last. Be that as it may, no part of the fusion $s_3 \cup s_4 \cup s_5$ is a truthmaker for H'. If we remove s_3 from the fusion, there is still room for the possibility that, in addition to those four horses, there is another horse in the match, which has uniquely ranked second. If we remove s_4, then there is still room for the possibility that $horse_2$ and $horse_3$ might have crossed the finish line simultaneously with $horse_1$, and thus all the three would have ranked first. If we remove s_5, there is still room for the possibility that $horse_4$ would have uniquely ranked second. In this way, $s_3 \cup s_4 \cup s_5$ satisfies of the minimality condition for H', although it is not an exact truthmaker for H'.

However, such an objection does not go through in the case of $s_1 \cup s_2$ and H. Which horse ranks first is quite relevant, first, to which horses have crossed the finish line, and second, to whether that horse has not ranked first.

I have not claimed that there are no other sources of irrelevancy. But I think I have shown that it is plausible to say that it is not the case that $s_1 \cup s_2$ has nothing to do with H or it includes something irrelevant to H. One who disagrees must first show that there is another source of

[7] For a similar discussion about whether the so-called minimality condition is not enough for the relevance required for truthmaking, see (Zamani 2017, 480-482).

irrelevancy and second, that the source of such irrelevancy prevents $s_1 \cup s_2$ from being an exact truthmaker for H. Until then, I think it is reasonable to say that $s_1 \cup s_2$ is an exact truthmaker for H.

5. A solution that does not work for Fine

In this section, I begin by showing that if only fundamental states could play truthmaking roles, that is, what Schipper calls "truthmaker fundamentalism," then a reply would be available to my counterexample against the disjunction thesis (Schipper 2021).[8]

Before I proceed, a formal change is necessary in how we symbolize the relation of truthmaking. Given that a fusion of a number of states is definitely not fundamental in that it is grounded in those states, if we restrict truthmakers to fundamentals, then a fusion of some states cannot qualify as a truthmaker. Instead, truthmaking should be treated as a single-plural relation, rather than a single-single relation as we have been doing throughout. Thus, instead of saying that $u \cup t$ is a truthmaker for P, assuming that *u* and *t* are fundamental, we should say that *u* and *t*, taken together, serve as a truthmaker for P.

In any case, given truthmaker fundamentalism, s_1 and s_2 are not truthmakers for H, even if horses and matches were fundamental, which they are not. In each possible world in which s_2 obtains, it is grounded in the states associated with the exact time when the horses cross the finish line. For instance, one might suppose that s_2 in the actual world is grounded in the following four states:

u_1: $horse_1$ has crossed the finish line at 10:00:00.

u_2: $horse_2$ has crossed the finish line at 10:00:05.

u_3: $horse_3$ has crossed the finish line at 10:00:10.

And of course, s_1 itself.

s_1, u_1, u_2, and u_3 are H's truthmakers, and they are truthmakers for a disjunct of H as well. (In another possible world in which s_2 is grounded in other fundamental states these grounds of s_2, together with s_1, are truthmakers of H, as they are truthmakers of a disjunct of H.)

As it seems, non-fundamental states are not always precise enough to determine the truth of a disjunctive proposition as well as that of its disjunct. The same is true of a state such as this particle's not being *m* kilograms. This state is not exact enough to make true a disjunct of <this particle is heavier than *m* kilograms or this particle is lighter than *m* kilograms>. However, a

[8] Schipper himself rejects this. See his paper for some advocates and grounds of the thesis.

fundamental state in which it is grounded, such as this particle's being *n* kilograms, assuming that the particle is fundamental, can be a truthmaker for the disjunctive proposition in question and one of its disjuncts.

The idea might be that, by fixing the fundamental entities of the world, all atomic propositions would be settled, and truth-values of non-atomic propositions would be determined by truth-values of those atomic propositions, and of course, by the state that is indicative of the totality of fundamental entities. However, non-fundamental states cannot always determine the truth-values of atomic propositions.

Such a solution is not fine for Fine's truthmaker semantics, however. For one thing, this would strike him as a conflation of metaphysical and semantical projects. What is fundamental is a metaphysical issue, while in the semantical project, nothing precludes the superficial—or the non-fundamental, so to speak. I think if we restricted truthmakers to fundamental states, while endorsing the conception of propositions proposed by truthmaker semantics, then the distinction between certain propositions would be lost. The crux of the matter is that certain distinct propositions only differ in their non-fundamental truthmakers. Let me make a case for this claim by presenting an example.

Before doing so, however, let me point out what Fine suggests as to how the metaphysical and semantical projects are related. In his view, the metaphysical project is carried out through grounding, rather than truthmaking, and as to the relation between truthmaking and grounding, he makes the following claim, which I call the "principle of connection": If P grounds Q, then the fact that P is a truthmaker for Q (2017b, 559).

Consider the following two propositions: <Socrates exists> and <the singleton of Socrates exists>. It goes without saying that Socrates is a truthmaker, or even the only possible truthmaker, of the former. In view of the principle of connection, and given that<Socrates exists> grounds <the singleton of Socrates exists>, the fact that Socrates exists, which is nothing but Socrates, is a truthmaker for <the singleton of Socrates exists> as well. The singleton of Socrates is a truthmaker for <the singleton of Socrates exists>. However, the singleton of Socrates is not a truthmaker for <Socrates exists>. As relevant as Socrates is to the truth of <Socrates exists>, it is irrelevant to its truth that Socrates is the only member of a set. On the truthmaker semantics, therefore, the propositions <Socrates exists> and <the singleton of Socrates exists> are nothing but, respectively, the following two sets: {Socrates} and {Socrates, the singleton of Socrates}.

However, the singleton of Socrates is grounded in Socrates, and thus, it is not fundamental. So if fundamentals could be truthmakers, the two propositions above would collapse into a single proposition, and truthmaker semantics would fail to make a distinction between them.

Two more, perhaps more controversial, examples. Consider the following pairs of propositions, along with sets of states which seem to be their possible truthmakers:

- <*a* is water> = {*a*'s being water, *a*'s being H_2O}
- <*a* is H_2O> = {*a*'s being H_2O}[9]

- <The fusion of *c* and *b* exists> = {fusion of *b* and *c*, *b* and *c*}
- <*b* exists and *c* exists> = {*b* and *c*}

The first member of each of the two-member sets above is grounded in the second member of the same set. Thus, by the definition of fundamentality, these first members do not qualify as fundamental. Without undermining the argument, one might assume that the second members of each of those two-member sets are fundamental or inventories of fundamentals. If truthmaker fundamentalism were true, then the first members of the two-member sets above would no longer be truthmakers of the relevant propositions. That being so, each of those intuitively distinct pairs of propositions would have the same possible truthmakers, and in light of truthmaker semantics, they would not be distinct.

To make a long story short, Fine's truthmaker semantics faces a problem: either it allows non-fundamental truthmakers or it does not. If it does, then In order to avoid my counterexample to disjunctive thesis, he could not appeal to truthmaker fundamentalism, and if it does not, then it will fail to distinguish many distinct propositions.

Statements and Declarations:

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[9] There can be an objection that propositions are not so fine-grained that <a is water> and <a is H2O> are not identical. This does not refute my claim. First of all, Fine takes propositions so finely grained that <a is water> and <a is H2O> are not identical. (2012, 47)). Second, this identity seems to be derived from some metaphysical thesis: being water is reducible to being H2O, and such considerations belong to the metaphysical rather than semantic project. Third, even if <a is water> and <a is H2O> are identical, the propositions of the next example clearly are not and support my claim.

Bibliography

Armstrong, D. 2004. *Truth and Truthmakers.* Cambridge: Cambridge University Press.

Barker, S, and M Jago. 2012. "Being Positive about Negative Facts." *Philosophy and Phenomenological Research* 85 (1): 117-138.

Fine, K. 2017a. "A Theory of Truthmaker Oontent I: Conjunction, Disjunction and Negation." *Journal of Philosophical Logic* 46 (6): 625-674.

Fine, K. 2012. "Guide to Ground." In *Metaphysical Grounding: Understanding the Structure of Reality*, edited by F Correia and B Schnieder, 37-80. Cambridge: Cambridge University Press.

Fine, K. 2009. "The Question of Ontology." In *Metametaphysics: New Essays on the Foundations of Ontology*, edited by D Chalmers, D Manley and R Wasserman, 157–77. Oxford, Chalmers, Manley, and Wasserman: Oxford University Press.

Fine, K. 2017b. *Truthmaker Semantics.* Vol. 1, in *A Companion to the Philosophy of Language*, edited by B Hale, C Wright and A Miller, 556-577. Oxford: Wiley Blackwell.

Jackson, F. 1994. "Armchair Metaphysics." By Philosophy in Mind: The Place of Philosophy in the Study of Mind, edited by Michaelis, O'Leary-Hawthorne, John Michael, 23-42. Dordrecht: Kluwer.

Jago, M. 2018. *What Truth Is.* Oxford: Oxford University Press.

O'Conail, D, and T. E Tahko. 2016. "Minimal Truthmakers." *Pacific Philosophical Quarterly* 97 (2): 1-17.

Read, Stephen. 2000. "Truthmakers and the Disjunction Thesis." *Mind* 109: 67-79.

Restall, G. 1996. "Truthmakers, Entailment and Necessity." *Australasian Journal of Philosophy* (74): 331–340.

Rodriguez-Pereyra, G. 2006. "Truthmaking, Entailment, and the Conjunction Thesis." *Mind* 115 (460): 957-982.

Russell, B. 2010. *The Philosophy of Logical Atomism.* Londin and New York: Rouledge.

Schipper, A. 2021. "Fundamental Truthmakers and Non-Fundamental Truths." *Synthese* 198: 3073-3098.

Zamani, M. 2017. "The Totality of States of Affairs and the Minimal Truthmaker." *Theoria* 83 (4): 471-483.