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Truthmaker Semantics and the Problem of Counterpossibles

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The problem of counterpossibles concerns the truth-values of counterfactuals with impossible antecedents. This paper approaches the issue from the perspective of truthmaker semantics (TMS). I argue that, despite its hyperintensional character, TMS ultimately assigns the same truth-value to all counterpossibles. Consequently, TMS fails to satisfy the unorthodoxy postulate, according to which some counterpossibles are true while others are false.

Counterpossibles, Truthmaker Semantics, Counterfactuals, Impossibility, Verifiers, Hyperintensionality

Counterpossibles are subjunctive conditionals taking the form 'If it were the case that *A*, then it would be the case that *C*' ('*A*>*C*'), where '*A*' expresses impossibility.[1] Popular examples of these concern metaphysical, mathematical, or logical impossibilities:

(1) 'If whales were fish, then they would have gills'.

(2) 'If 10 were a prime number, then it would be green'.

(3) 'If it were raining and not raining at the same time, the Sun would be a planet'.

The debate about counterpossibles is a debate about their truth conditions. In the so-called *orthodox* approach, each counterpossible is vacuously true (Stalnaker 1968; Lewis 1973; Williamson 2016). In the opposite *unorthodox* approach, some counterpossibles are true and some are false (Yagisawa 1988; Nolan 1997; Priest 2009; Berto et al. 2017). So, while (1) is true, (2) and (3) are false. A motivation for the idea that (1) is *non-vacuously* true is the belief

[1]I am grateful to Giorgio Lenta, Mariusz Popieluch, and the anonymous reviewers of this journal for their insightful and constructive feedback on earlier versions of this paper.

that there is a false counterfactual with the same impossible antecedent but a different consequent. For example:

(1*) 'If whales were fish, then they would have wings'.

These issues are related to a more general question about the semantics of counterfactuals. Given the popularity of possible worlds semantics (PWS) in this context, some authors approach the question of counterpossibles from this very perspective. They typically address it through a straightforward extension of the domain of worlds to include impossible ones. While the notion of impossible worlds may seem controversial, once accepted, it yields a hyperintensional semantics capable of distinguishing between different kinds of impossibility. This feature is widely regarded as the key to securing unorthodoxy. There are, however, other approaches. A notable alternative is Kit Fine's (2012; 2017; 2020; 2023a; 2023b) *truthmaker semantics* (TMS). I will argue that, despite Fine's (2020) professed allegiance to unorthodoxy, his view, in fact, ascribes the same truth-value to all counterpossibles.

Sections 1 and 2 of this paper lay out the TMS framework and the relevant possible and impossible states. In Section 3, I demonstrate how TMS accommodates counterfactuals. Section 4 contains the core of my thesis, focusing on Fine's account of truth conditions for counterfactuals (Fine 2012; 2017; 2020). Section 5 then closes the paper with some remarks on Fine's more recent modification of the account, which introduces truthmakers for counterfactuals (Fine 2023a; 2023b).[2]

Before proceeding, I want to stress three key points. First, I take the central issue in the debate over counterpossibles to concern their *truth-values*. Some accounts aim to address pre-theoretical (or folk) intuitions regarding differing truth-values between (1) and (1*) by

[2] The balance between the exposition of TMS (sections 1-3) and my argument (sections 4) may not be ideal. This setup, however, aims to guarantee the clarity of the notions upon which this argument relies and highlight these aspects of TMS that may be the source of the orthodox consequences of this semantics.

appealing to pragmatics rather than semantics. On this view both counterpossibles are taken to be true, but they differ in terms of their assertion conditions (Lewis 1973; Emery and Hill 2017). This approach preserves orthodox possible worlds semantics while acknowledging the intuition that not all counterpossibles are equally acceptable. However, despite its sensitivity to pre-theoretical judgments, this approach is orthodox, since it maintains that all counterpossibles are true.[3] Thus, what is essential to unorthodoxy, as I will use the term throughout this paper, is the commitment to treating some counterpossibles as true and some as false.

Second, TMS was not initially developed with counterpossibles in mind (Fine 2023b: 391). However, there were already indications that the vacuous truth of every counterpossible was a significant shortcoming of PWS (Fine 2012: 221). As the framework evolved, it became clear that accounting for the non-vacuous truth of counterpossibles is a desirable feature of any semantics of counterfactuals, including truthmaker semantics. Fine himself explicitly suggested that, by allowing impossible verifiers, TMS could provide a genuinely unorthodox treatment of counterpossibles (Fine 2020: 153-4). In this way, TMS aligned itself with the broader 'hyperintensional revolution' (Berto and Nolan 2021; Lenta 2023). However, this shift required modifications to the original framework. To illustrate this, I will first outline the initial assumptions about key notions of TMS (e.g., the transition relation) and then explain why some of them had to be abandoned.

Finally, I do not claim that Fine's truthmaker semantics is inherently or essentially incapable of providing a successful analysis of counterpossibles. Rather, I argue that it requires further refinement. In this light, the paper can be read both as a diagnosis of current limitations and as a step toward future development.

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[3] For a discussion regarding the plausibility of 'pragmatic orthodoxy', see Sendłak (2019).

The key feature of TMS is a *verifier* (or a *truthmaker*), a state that makes a given statement true. Verifiers come in three forms—loose, inexact, and exact—depending on their degree of relevance to the statement they verify.

Loose verifiers. State s is a loose verifier of statement A ($s|=A$) if it is impossible for s to obtain and for A not to be true. Thus, the state of *Paris being the capital of France* is a loose verifier of the statement 'It is snowing or it is not snowing'. The statement is necessarily true so it is impossible for *any* state to obtain that renders it not true. This includes the state of *Paris being the capital of France*.

Inexact verifiers. A stricter notion of a verifier is an inexact verifier ($s||>A$). This is a verifier that is partially relevant to the verified statement. For example, the state of *Paris being the capital of France and Berlin being the capital of Germany* is an inexact verifier of the statement 'Paris is the capital of France'. This is due to the partial relevance of the state to the statement. While part of the state (*Paris being the capital of France*) is relevant to the verified statement, there is also part of the state (*Berlin being the capital of Germany*) that is irrelevant to the statement.

Exact verifiers. A state is an exact verifier ($s||\text{-}A$) of a statement if it is *wholly* relevant to the statement. For example, the state of *Paris being the capital of France* is an exact verifier of 'Paris is the capital of France'. The relation between the three types of verifiers is such that every exact verifier for a statement A is also an inexact verifier for A, and every inexact verifier for A is also a loose verifier for s. Accordingly, every exact verifier is also a loose verifier.

Besides verifiers, TMS also includes *falsifiers*, states in virtue of which a given statement is false. The relationship between the verifier of a given statement A and its falsifier ($s\text{-}||A$) is such that $s||\text{-}A$ if $s\text{-}||\neg A$. Likewise, $s||\text{-}\neg A$ if $s\text{-}||A$. Importantly, Kit Fine emphasizes that the concept of the verifier encompasses not only actual states but also extends to non-actual ones:

verification will have a counterfactual flavor; a verifying state is one that would make a given statement true were it to obtain, not necessarily one that does make the statement true (Fine 2017: 560).

The basic frame for TMS is a tuple (S, $\sqsubseteq$), where S is a non-empty set of states and $\sqsubseteq$ is a binary parthood relation. Given their mereological structure, states can also fuse. These fusions are also states. Thus, if there is a state s_1 (*Amélie lives in Paris*) and a state s_2 (*Bob lives in London*), then there is also the fusion $s_3 = s_1 \sqcup s_2$ (*Amélie lives in Paris and Bob lives in London*). s_1 and s_2 are, then, substates of s_3. In TMS, fusions can also play the role of verifiers (or falsifiers) of more complex statements:

s||-$A \wedge B$ if for some states t and u, t||-A and u||-B, and $s = t \sqcup u$;

s-||$A \wedge B$ if s-||A or s-||B;

s||-$A \vee B$ if s||-A or s||-B;

s-||$A \vee B$ if for some states t and u, t-||A and u-||B, and $s = t \sqcup u$ (Fine 2017: 563).

Notice that the above reflects how *exact* exact verifiers are. It might seem that a verifier for $A \wedge B$ should also be a verifier for A and for B. After all, if s makes $A \wedge B$ true, it should make both A and B true as well. Despite being intuitive, this goes against the very idea of the exact verifier.[4] For this verifier is meant to be a state that is wholly relevant to the statement it verifies. In this sense, state s is merely an inexact verifier for A and B. Due to the above mentioned relation between types of verifiers, s is also a loose verifier for each of the mentioned conjuncts.

The original set of states is not limited to possible states. One can, however, provide the state space with a modal structure. This is done by modifying the original state space to (S, $S_\diamond$, $\sqsubseteq$), where $S_\diamond$ is a non-empty subset of S only containing possible states. When introducing possible states, one can also define a world-state (w). w is a correlate of what possible world

[4] For the metaphysical aspects of thus understood truthmakers, see Sendłak (2022).

semanticists take to be a possible world. Since possible worlds are maximal and consistent, in a similar vein, state w is a world-state if it is possible and if any state s is either a substate of w or incompatible with w. State s and state w are incompatible if and only if their fusion is not an element of $S^{\diamond}$. Importantly, in virtue of TMS every substate of a possible state is also a possible state.

Knowing the definition of exact verifiers and bearing in mind the difference between types of verifiers, we can also define inexact verifiers and loose verifiers.

Inexact verifier:

$s \,\|\!> A$ if $\exists t\, (t \sqsubseteq s \wedge t \|\!- A)$.

s is an inexact verifier for A if it contains an exact verifier for A.

Loose verifier:

$s \models A$ if $\forall t\, (t \,\text{-}\|\, A \longrightarrow s \sqcup t \notin S^{\diamond})$.

s is a loose verifier for A if it is incompatible with all falsifiers of A (Fine 2019).

The above should be uncontroversial in standard cases. Consider a state s_3 being a fusion of (s_1) *Paris is the capital of France* and (s_2) *Berlin is the capital of Germany*. This fusion is an inexact truthmaker for the statement 'Paris is the capital of France' because s_1 is an exact truthmaker for it and it is a substate of s_3.

For an example of a loose verifier, consider the statement 'Paris is the capital of France or Paris is not the capital of France' ($A \vee \neg A$) and an arbitrary state (t) *It is raining*. For this state to be a loose verifier of the statement, every falsifier u of $A \vee \neg A$ must be incompatible with t. State u is a falsifier for $A \vee \neg A$ if u is a fusion of states where one of them is a falsifier for A and the other is a falsifier for $\neg A$. Given that a falsifier for A is a verifier for $\neg A$ and that a falsifier for $\neg A$ is a verifier for A, a fusion of these states is not a possible state. It, therefore, does not belong to $S^{\diamond}$. As such, no other states (including t) can form a possible fusion with u. Thus, *It is raining* is a loose verifier of 'Paris is the capital of France or Paris is not the capital of France.'

In other words, it is impossible for t to hold and for the mentioned statement not to be true. This illustrates how any arbitrary state can act as a loose verifier for any necessarily true statement. After all, only an impossible state can function as a falsifier for a necessarily true statement.

2

On world-states' definition, none of them are considered impossible. This does not mean that there are no impossible states, but only that such states are not world-states (Fine 2020). Thus, while impossible states are not contained in $S^\diamond$, they do belong to the broader domain S. Given $s_1 \Vdash A$ and $s_2 \Vdash \neg A$, the fusion $s_3 = s_1 \sqcup s_2$ does not belong to the space of possible states. It is, nonetheless, a state. Specifically, s_3 is an exact truthmaker for the conjunction $A \wedge \neg A$. Furthermore, although $A \wedge \neg A$ and $B \wedge \neg B$ are impossible, s_3 is not an exact truthmaker for the latter. Thus, unlike standard possible worlds semantics, TMS allows us to distinguish between various contradictions. However, this does not mean that TMS allows for impossible worlds.

It is worth noting that there are two kinds of impossible states in TMS.

First kind

The first kind involves fusions of incompatible states, where each is a possible state on its own. The impossible state *it is raining and it is not raining* is a fusion of states s_1 and s_2. The first state verifies 'It is raining' and the second verifies 'It is not raining'. This impossible state is represented by a set of states $\{s_1, s_2\}$, such that $s_1 \sqcup s_2 \notin S^\diamond$. Given that a fusion state is an exact truthmaker for a conjunctive statement, all impossibilities in this category are expressed as conjunctions of incompatible statements. A limitation of this kind of impossible states is its failure to capture those impossibilities that do not take the form of contradictions. Consider the metaphysical impossibility ‘Hesperus is not Phosphorus’ or the mathematical impossibility ‘2 is an odd number,’ which cannot be reduced to pairs of contradictory statements.[5]

Second kind

There is, however, a natural way to include verifiers of the above statements in TMS. ‘Hesperus is Phosphorus’ and ‘2 is an even number’ are atomic, true statements. As such, they have their atomic verifiers, i.e., verifiers that are not fusions. There is, likewise, no reason to exclude atomic verifiers for atomic *im*possibilities. Thus, if a statement is a contradiction, then it is correlated with a fusion of incompatible states. But if a statement is necessarily false and does not contain logical connectives, it is correlated with an atomic impossible state. A distinctive feature of these states is that (unlike possible states) they are incompatible with any possible state. Fine calls them modal monsters (2020: 155). Crucially, neither kind of impossible states (fusions of incompatible states or modal monsters) can function as constituents of a world-state. Furthermore, by allowing such impossible states, TMS secures its hyperintensional character, since it can distinguish between different kinds of impossibility.

3

TMS’s account of counterfactuals accommodates the following:

1. All three categories of verifiers.
2. A relation of transition ($t \rightarrow_w u$).
3. Two additional assumptions: (i) the antecedent’s universal realizability and (ii) the consequent’s universal verifiability (Fine 2012: 236).

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[5] It might be appealing to reduce *all* impossibilities to collections of possibilities (e.g., sets, pairs, or fusions). However, such a reduction requires specifying certain background assumptions or ‘bridge principles.’ In the cases discussed, these would include assumptions such as ‘Hesperus is Phosphorus,’ ‘2 is an even number,’ and ‘No even number is odd.’ The fact that such assumptions are not required in the case of contradictions provides a natural basis for distinguishing two kinds of impossibilities. Importantly, this issue is not unique to Fine’s account but also arises in other approaches that attempt to construct impossibilities out of possibilities. For further discussion, see Berto (2009), Jago (2012), Sendłak (2015), and Fouché (2024).

Since the reader should by now be familiar with the different types of verifiers, let us begin with the aforementioned relation of transition. This is a relation between an exact verifier of the antecedent (t) and an inexact verifier of the consequent (u). It is sometimes described in terms of the possible outcome of the exact verifier of the antecedent. This is how Fine explains it:

> An outcome is naturally taken to be a future causal outcome. But such a narrow interpretation is not required. In the case of backtracking counterfactuals, for example, the relation → could be taken to be a backwards arrow, relating the given state to the states that would have had to obtain for it to obtain; and in other cases (such as 'if this peg had been round then it would not have fit the hole'), the relation could be taken to be more logical or conceptual in character (2012: 237).

Intuitively, a transition occurs between the verifier of the antecedent of a counterfactual and the state that results from imposing this verifier onto the world of evaluation. Importantly, this resulting state is a world-state. This is because a world-state of evaluation w, changed by the hypothetical state t, remains a world-state. It is, however, distinct from w. The outcome of t from the perspective of w is a world-state that w would have been, had t been a part of w.[6] This is akin to the outcome of a player change within a football team during a game—a team with a varied collection of players emerges.

Fine's (2012) account of counterfactuals relies on three additional assumptions regarding transition. These assumptions are intuitively plausible in the case of standard counterfactuals. However, as we will see, they also introduce potential complications when extended to counterpossibles:

[6] Notice that this characteristic of transition makes it a counterfactual notion. While this may raise the problem of the circularity of the TMS account of counterfactuals, similar to the one that Goodman (1947: 121) raised against his own account, I do not intend to explore this in detail here.

1. *Inclusion*. If $t \rightarrow_w u$, then $t \sqsubseteq u$ (Fine 2012: 239). This allows us to justify one of the axioms of the logic of counterfactuals, viz., *Identity* $A > A$. If $t \| \text{-} A$ and $t \rightarrow_w u$, then, given *Inclusion* (and *Inexact verifier*), $u \| > A$.
2. *Completeness*. The outcome state u, which is meant to be a verifier for a counterfactual's consequence, is a world-state (Fine 2012: 240). The outcome results from a hypothetical assumption of the truth of A within a world w. u is a world state because the outcome of the assumption is also a world.[7] Put differently, the outcome is the world of evaluation that has been changed by the hypothetical truth of A.
3. *Consistency*. Fine does not explicitly state this assumption, but it is a straightforward consequence of assumptions 1 and 2 and the definition of a world-state outlined above. I will call this assumption *Consistency*.

   Consistency: if $t \rightarrow_w u$, then $t \sqcup u \in S^{\diamond}$.

   The essence of counterfactuals is reflected in the requirement of consistency of the outcome and the verifier of the antecedent. Regardless of the actual truth of 'Paris is the capital of France', this ensures that the outcome of a merely possible state *Paris is not the capital of France* is not an inexact verifier for 'Paris is the capital of France *and* Paris is not the capital of France'. Whatever is meant to be the outcome of A, it must be consistent with the assumption of the truth of this antecedent. In essence, *Consistency* ensures that even if $\neg A$ is actually true, reasoning based on the hypothetical truth of A will not result in an inconsistent consequent.

The final element of the TMS account lies in two core assumptions. The universal realizability of the antecedent holds that a counterfactual $A > C$ is true only if it is true for every way in which the antecedent A might be verified. The universal verifiability of the consequent requires that

[7] While *Completeness* is important because it allows us to address cases of nested counterfactuals that have a counterfactual as an antecedent, Fine himself has raised questions about the plausibility of this assumption (Fine 2012: 240).

the counterfactual is true only if it is true under any outcome of the way in which the antecedent is true.

Before delving further, it is worth noting that the idea of the antecedent's universal realization raises certain concerns. Consider Nelson Goodman's famous example of a presumptively true counterfactual: 'If that match had been scratched, it would have lighted' (1947: 116). Since the match might be struck in number of ways, the antecedent can be made true by variety of states. Some of them are states where the match is not well made, it is wet, or there is not enough oxygen in the room. These are cases, where the match would not light up, which would make the above conditional false. Thus, if a counterfactual is true only if it is true for *every* way in which the antecedent is true, this may put into the question the plausibility of the mentioned assumption. After all, counterintuitively, this would result in Goodman's example being false.

The crux of this problem may lie in the notion of exact verifier, specifically concerning the extent to which an exact verifier must precisely match a given statement, or what criteria define the full range of possible ways in which a statement can be true. While this issue may pose fewer challenges in formal language contexts (Fine 2017), it becomes significantly more complex when applied to natural language counterfactuals. Like many other semantic problems in natural language, it is challenging to disregard the pragmatic aspects involved. Conditionals are no exceptions, because their truth values are context-dependent (Moss 2010; Lewis, 2016; Popieluch, 2022; Puczyłowski, 2024). This realization was aptly acknowledged by the authors of PWS's analysis of counterfactuals, who underscored the importance of context-sensitivity in determining the similarity between worlds.

One way of addressing the pragmatic dimensions of counterfactuals within TMS is to incorporate context-sensitivity in defining the set of exact verifiers of antecedents (Fine 2019). Hence, if we define every exact verifier of 'I strike the match' as encompassing *absolutely* every possible way in which this statement can be true, then there are compelling reasons to consider this counterfactual as false. However, counterfactual statements are typically asserted within specific contexts, enabling us to narrow down the set of relevant states accordingly. In a standard context, where one holds a dry, well-made match in a room with sufficient oxygen, states contradicting these conditions would not qualify as possible exact verifiers. This helps to justify the truth of Goodman's example.[8]

Drawing on the discussion in this and the previous sections, the truth condition for counterfactual (TCC) $A{>}C$ can be formulated as follows:

$$\text{(TCC) } w|{=}A{>}C \text{ iff } \forall_t[(t||{-}A \wedge t{\rightarrow_w}u) \longrightarrow u||{>}C].$$

Given (TCC), $A{>}C$ is true in a world of evaluation w if any exact verifier of the antecedent transits to an inexact verifier of the consequent (Fine 2012: 236; 2019).

4

The above should provide us with the tools to tackle the problem of truth values of counterpossibles. We know what a verifier is, what truth conditions for counterfactuals are, and what impossible states are.[9] However, it is not clear that this allows for an unorthodox approach to counterpossibles. The unorthodox approach commits to non-vacuously true counterpossibles. Some counterpossibles must, therefore, be true, and some must be false. In this section, I argue that Fine's proposal does not satisfy this condition. Consider two examples:

(W) 'If whales were fish, then they would have gills'.

[8] For a discussion over the plausibility of the antecedent's universal realizability and the consequent's universal verifiability, see (Embry 2014).

[9] As Fine wrote: 'On [my account], the counterfactual from *A* to *C* is taken to be true if any outcome of a verifier for *A* will contain a verifier for *C*. If verifiers are required to be possible states, then a counterfactual with a counter-possible antecedent will be vacuously true, just as with the possible worlds account. But if we allow the verifiers of the antecedent to be impossible states, then there is the possibility of distinguishing between counterfactual statements with different counter-possible antecedents.' (Fine 2020: 154)

(P) ‘If 10 were a prime number, then it would be green’.

Given (TCC), for (W) to be true, every state a_W (such that a_W||-‘Whales are fish’) transits into state c_W (such that c_W||>‘Whales have gills’).[10] Likewise, for (P) to be false, some states a_P should not transit into c_P||>‘10 is green’.

Drawing on the discussion above, we can scrutinize the unorthodox declarations of TMS through a two-step analysis. In the first step, we identify the fundamental challenge of applying (TCC) to counterpossibles and propose a modification. This adjustment aims to align with the core tenets of TMS while providing a pathway to surmount the identified obstacle. Moving to the second step, we explore why, even with this modification, TMS ultimately aligns with orthodoxy. This elucidates that the orthodox consequences of TMS stem from either constraints on world-states or the notion of loose verification. Alterations to either of these components may facilitate the acceptance of non-vacuously true counterpossibles, but they would necessitate significant revisions to the framework of TMS.

First step

The first step centres around the notion of transition. To apply (TCC) to counterpossible A>C we must assume that (i) A expresses some impossibility, (ii) t||-A, and (iii) $t \rightarrow_w u$ for some state u. We can derive several contradictions from this, but we should not reject supposition (i) because we want to see what it implies. After all, the antecedent of a counterpossible does express an impossibility. The following demonstrates how (ii) and (iii) are inconsistent given (i).

1. Firstly, we derive $t \notin S_\diamond$ from (ii) because a possible state cannot be an exact verifier for an impossible A.

[10] For the sake of simplicity, I use ‘a_X’ and ‘c_X’ for the verifier of an antecedent and of a consequent of a counterfactual (X), respectively.

2. Next, we derive $t \sqsubseteq u$ from (iii) and *Inclusion*. And, we derive $u \notin S^{\diamond}$ from the properties of possible states. If u has an impossible state as its part, u is not a possible state. Since every world-state is a possible state, u is not a world-state.
3. Finally, we derive that $t \rightarrow_w u$ is not the case from the contrapositive of the *Completeness* condition. Since u is not a world-state, it is not an outcome of t. This contradicts (iii).

The conjunction of (ii) and (iii) is false because (ii) and (iii) are inconsistent. This means that the antecedent of the conditional $\forall_t[(t \Vdash A \land t \rightarrow_w u) \longrightarrow u \| {>} C]$ is false. This, in turn, renders the conditional true for any $t \notin S^{\diamond}$. Accordingly, all counterpossibles come out true because $t \notin S^{\diamond}$ is a necessary condition for $A{>}C$ not being true. It follows that examples (W) and (P) are both true counterfactuals.

A natural way to address the above worry is to place some conditions on the transition relation. This would require rejecting at least one of the above assumptions related to this relation. A natural candidate is *Consistency* given that we are interested in impossible states. Once this condition is removed, the outcome need not be possible if the verifier of the antecedent is impossible (Fine 2020: 154; Morales Carbonell 2022). The *Completeness* assumption must also be rejected because we are permitting impossible outcomes, and these are not world-states. This raises the question of how such alterations impact the original (TCC). Remarkably, a complete overhaul is not required. We can overcome the tension between *Completeness* and the need for non-vacuously true counterpossibles by paraphrasing '$u \| {>} C$' as '$u \models C$'. While the outcome need not be a world-state anymore, the nature of loose verification allows us to do justice to some intuitions underpinning *Completeness*. This is how (TCC)'s third component can be replaced with $u \models C$ and a rejection of *Completeness* (Fine 2012: 240). We can, consequently, state modified truth conditions as follows:

$$\text{(TCC*) } w \models A{>}C \text{ iff } \forall_t[(t \Vdash A \land t \rightarrow_w u) \longrightarrow u \models C].$$

This adjustment does not only give a hope for the unorthodox analysis of counterpossibles but also does not disrupt an analysis of 'regular' counterfactuals. However, below I show why this hope is rather difficult to fulfil.

Second step

The second issue with TMS's approach to counterpossibles does not revolve around the notion of transition. Instead, it focuses on the loose verification of the consequent, which is crucial for (TCC*). Once again, I will argue that TMS justifies the truth of every counterpossible. To illustrate, consider this example of what appears to be a false counterpossible:

(P) 'If 10 were a prime number, then it would be green'.

If the outcome of a_P (i.e. c_P) fails to loosely verify '10 is green', then (P) will be false. It is difficult to achieve this result because of the very notion of a loose verifier. As previously stated, state s is a loose verifier for A if it is incompatible with every falsifier for A:

$s|{=}A$ if $\forall t\ (t\text{-}||A \longrightarrow s\sqcup t\notin S\diamond)$.

Thus, a state s fails to loosely verify statement A ($s|{\neq}A$) if there is a state t such that t is an exact falsifier of A and the fusion of s and t is a possible state:

$s|{\neq}A$ if $\exists t\ (t\text{-}||A \wedge s\sqcup t\in S\diamond)$.

But, this failure is impossible in the case of a counterpossible. By *Inclusion*, the outcome state s contains the (impossible) state verifying the antecedent, and so s is also impossible. This means that the fusion of s with any other state t will never be a possible state. One of a consequences of this is that the outcome of a_P does not fail to verify '10 is green', which makes (P) true. For the same reason, state c_P (as any outcome of an impossible state) becomes a loose verifier for *any* statement, including statements like 'Whales have wings', '10 is yellow', 'Maria Skłodowska-Curie is a married bachelor', and 'Paris is the capital of Argentina'. After all, the impossibility of c_P renders any fusion involving this state an impossible state. It follows that the fusion of c_P with any falsifiers for the above statements does not belong to $S_\diamond$. This makes each of the below true:

(P1) 'If 10 were a prime number, then whales would have wings'.

(P2) 'If 10 were a prime number, then it would be yellow'.

(P3) 'If 10 were a prime number, then Maria Skłodowska-Curie would be a married bachelor'.

(P4) 'If 10 were a prime number, then Paris would be the capital of Argentina'.

Thus, (W) is true (as it should be), but so is (P) and any other counterfactual with an impossible antecedent. This aligns TMS with the orthodox approach to counterpossibles.

5

It should be noted that in his recent works, Kit Fine proposed a modification to his initial account of counterfactuals (2023a, 2023b). Let me close this paper with a few remarks concerning this modification. For reasons I will shortly make explicit, this is by no means an exhaustive analysis of the problem of counterpossibles from the point of view of Fine's later works. The core of the modification lies in extending the previously discussed truth conditions by introducing truth*makers* for counterfactuals. Setting aside some technical nuances that are not pertinent to this paper, Fine claims that a state s is an exact verifier (or truthmaker) of a counterfactual $A>C$ if, by virtue of s, every exact truthmaker of the antecedent transitions into the set of exact verifiers for the consequent. In other words, s is 'a fusion of paths that connect each exact truthmaker for [the antecedent] into an exact truthmaker for [the consequent]' (Fine 2023a: 227). This notion of a verifier resembles that of the transition relation discussed in the previous section. The key difference between the two is that the verifier no longer has to be a world-state w (Fine 2023a: 226). Accordingly, we can say that the presence of state s, such that $t \rightarrow_s u$, indicates that u will be present under the presence or addition of t.

This modification allows for a more detailed analysis, as it enables us to determine not only when a counterfactual is true at *w* but also what part of *w* makes it true. It has significant implications for the analysis of so-called infinity paradoxes, embedded counterfactuals, and certain questions of hyperintensionality (Majer et al. 2023; Bacon 2023; Fine 2023a; Fine 2023b). There are, however, two reasons why I will not explore here the application of this modified account to the question of counterpossibles.

First, Fine developed an account of truthmakers while leaving aside the notion of *falsitymakers*. In this sense, while there might be tools to explain the truth of a given counterfactual, there is not (yet) an account of what makes a counterfactual false. If (i) unorthodoxy requires some counterpossibles to be false, and if (ii) we assume that the lack of a truthmaker for *A* is insufficient for the falsity of *A*, then this modified account would require further development. The second assumption reflects the distinction between unilateral and bilateral semantics: on the former view, the absence of a truthmaker suffices for falsity, while on the latter, falsity must be grounded in the presence of a falsitymaker. Given its theoretical advantages (Fine 2017: 564; 2023b: 395), there are good methodological reasons to prefer the bilateral option, and thus to expect a falsifier for counterfactuals.

Second, and perhaps more importantly, an attempt to apply this account to counterpossibles would be unjustified in the first place. While Fine suggests that, in principle, the modified approach should be extendable to counterpossibles, he describes them as counterfactuals whose consequents arise not from a particular transition state but from the mere impossibility of the antecedent, which he refers to as 'dead-end' antecedents (Fine 2023a: 225). Similarly, the suggestion that the truth of $A>C$ entails the falsity of $A>\neg C$ is made with the reservation that *A* should be *possible* in such cases (Fine 2023b: 395). Both are key assumptions of the orthodoxy. The former shows that what determines the truth-value of a counterpossible is not the relation between antecedent and consequent (as it is the case with 'regular' counterfactuals) but merely the *modal status* of the antecedent. Likewise, the latter—known as axiom A4 of Stalnaker's semantics (1968: 106)—shows that the relation between a counterfactual and its negation depends on the modal status of the antecedent.[11]

The above considerations show that—at least in its current state—Fine's later account does not aim to provide an unorthodox semantics. The question of whether it is possible to extend it so as to distinguish true from false counterpossibles remains open, but I do not intend to address it here. After all, in his later works, Fine seems less enthusiastic about unorthodoxy compared to his earlier discussions of TMS accounts of counterfactuals. For that reason, it would be unjustified to examine this account in light of data it was not designed to address in the first place.

I have demonstrated that the original formulation of (TCC) fails to justify the non-vacuous truth of some counterpossibles. This issue stems from important assumptions concerning the notion of transition, which require outcomes to be world-states. Modifying (TCC) to (TCC*) does not resolve the issue, as all counterpossibles remain true. This is because any impossible state serves as a loose verifier for any statement. The upshot is that, despite its hyperintensional character, TMS remains orthodox in its treatment of counterpossibles. This not only calls into question the unorthodoxy of TMS but also points toward possible ways of revising the framework. While certain modifications—such as incorporating impossible world-states or redefining loose verification—might address the issue, they would require significant departures from the foundational principles of truthmaker semantics. Exploring such modifications lies beyond the scope of this paper, which primarily aims to show that, in its

[11] I assume here that $A{>}\neg C$ is a negation of $A{>}C$. Yet, it should be noted that the question of what constitutes the proper form of the negation for a counterfactual remains a subject of debate (e.g., Stalnaker 1968; Lewis 1973; Williams 2010; Nickerson 2015). The formulation proposed above appears to be the least controversial and is also supported by empirical studies (Espino et al. 2022).

current form, there is no compelling reason to regard TMS as a genuinely unorthodox semantics for counterfactuals with impossible antecedents.

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