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In Between Impossible Worlds

Abstract

The common view has it that there are two families of approaches towards the logical structure of impossible worlds – Australasian and North American. According to the first, impossible worlds are closed under the relation of logical consequence of one of the non-classical logics. The North American approach is more liberal, allowing for impossible worlds where no logic holds. After pointing out the questionable consequences of each view, I propose a third one. While this new perspective allows for worlds where no logical consequence holds, it also imposes some constraints on what worlds are built upon. This renders the proposed view not as restrictive as the Australasian approach and not as liberal as the North American approach. Due to its intermediary nature, I have named this perspective 'the Pacific' approach.

Regardless of its undeniable theoretical success, possible worlds semantics (PWS) faces some important obstacles.[1] Many of them relate to the problem of hyperintensionality, i.e., the problem of the granularity of meaning or content of necessarily true (or false) expressions. While contingently co-extensional content (e.g., the propositions 'Vienna is the capital of Austria' and 'Canberra is the capital of Australia') can be correlated with different sets of possible worlds, in the case of necessarily co-extensional content (e.g., the propositions '2+2=4' and 'Every bachelor is unmarried') all of them are correlated with the same set. In the case of necessarily true propositions, all of them are correlated with the universal set of worlds *W*. All necessarily false (impossible) propositions correlate with the empty set. Due to the plentitude and importance of the roles that propositions play in our inquiries, such a coarse-grained analysis of them seems implausible (e.g., Jago 2014, ch. 2.; Merricks 2015, ch. 3.; Berto and Jago 2019, ch. 8.).

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While the problem is not a new one (e.g., Cresswell 1975; Tichý 1988; Wansing 1990), in recent years we have witnessed a 'hyperintensional revolution' (Nolan 2014). The goal of this revolution is to provide tools for a more fine-grained analysis of propositions. Accordingly, some recommend rejecting PWS altogether and explain the question of hyperintensionality in terms of structured propositions (King 1995; Soames 2008), others seek solutions in state semantics (Yablo 2014; Fine 2017). Still others argue that instead of rejecting possible worlds semantics, one ought to modify the standard PWS. The modification is grounded in an extension of the world domain, achieved by introducing *im*possible worlds—those in which some propositions that are necessarily false in the actual world are considered true.[2] Since there are worlds where '2+2=4' is not true and some where 'Every bachelor is unmarried' is false, the extension of PWS provides a tool for distinguishing necessarily co-extensional content. Thus, in a sense, there is a natural way of addressing the problem of hyperinstensionality within the framework of PWS.[3]

As many have shown, this Extended Possible Worlds Semantics (EPWS) allows one to overcome some of the limitation of the standard approach. That includes investigations concerning causality (Bernstein 2016; Nolan 2017), imagination (Berto 2017), intentionality (Priest 2005/2016), logical omniscience (Rantala 1982; Bjerring 2013), fiction (Berto and Badura 2019; Sendłak 2021), metaphysical essence (Brogaard and Salerno 2013), and propositional attitudes (Jago 2014; Berto and Jago 2019). Importantly, many of these involve the so-called unorthodox view on counterfactuals. As opposite to the standard PWS, which has it that all counterpossibles (i.e., counterfactuals with impossible antecedents) are vacuously true (Stalnaker 1968; Lewis 1973; Williamson 2018), advocates of unorthodoxy argue in favor of the non-vacuous truth of some counterpossibles (Yagisawa 1988; Nolan 1997; Priest 2009;

[2] I use 'true *at* a world' and 'true *in* a world' interchangeably. Both expressions convey the idea that the truth of a formula is evaluated within a specific world.

[3] Some, however, claim that discrepancies between the original PWS and proposed modification are crucial enough to consider them two very different approaches (Bjerring and Schwarz 2017).

Brogaard, Salerno 2013; Berto et al. 2018; Sendłak 2019; Kocurek 2021). This is grounded in the general truth-conditions for counterfactuals:

> (CF) 'If it were/had been the case that *A*, then it would be the case that *C*' ('*A*>*C*') is true at a world *w* iff there is a possible or impossible world *w*' where '*A*' and '*C*' are true and *w*' is more similar to the *w* than any world *w** where '*A*' is true but '*C*' is not true.

As in the case of any other revolution, including the hyperintensional one, there is always a risk of it failing. Thus, if EPWS resulted in implausible consequences, there would be good reason for abandoning it and either accepting the pre-revolutionary state of semantics or looking for an alternative way of changing that state. What is often considered to be such an implausible consequence is the very belief in impossible worlds, which for many are questionable entities. In this sense, the question of whether the goal of EPWS is achievable depends upon how the extension of the domain of worlds affects the fundamental concepts of PWS.

The objective of this paper is to compare two families of perspectives on the notion of logically impossible worlds and to propose a third one. Following introductory remarks in section 1 and an exploration of concerns related to the two existing approaches in section 2, I present the third approach in sections 3 and 4. This viewpoint rests on two assumptions: (i) worlds are sets of ontological correlates of expressions of the object language, and (ii) laws of logic are generalizations of what is true in a given world. Finally, in section 5, I address potential criticisms of my proposal.

1. From Possible to Impossible Worlds

One of the commonly agreed upon features of possible worlds is that they are complete and consistent. This means that for every proposition *A* and for every possible world *w*, (i) either *A* or ~*A* is true at *w*, and (ii) it is not the case that both *A* and ~*A* are true at *w*. This is partly grounded in the assumption that logical truths are necessary; hence, since $A \lor \sim A$ and $\sim(A \land \sim A)$ are logical truths, they hold at every possible world. If that is how possible worlds are meant to be understood, the most straightforward way of understanding logically impossible worlds is to consider them worlds which fail to satisfy conditions (i) and/or (ii). Accordingly, these are worlds which are, incomplete, inconsistent, or both.[4]

Since EPWS is meant to be an extension of the standard model, it inherits some of the formal framework of PWS. Thus, the modified model might also be presented as a triple $\langle W, R, v \rangle$. What differs is how each element of this triple is interpreted. In virtue of EPWS, W contains two subsets of worlds, P and I, such that P contains every possible world (including the actual world) and I includes every impossible world.[5] Since possibility and impossibility are exclusive notions, no world belongs to both P and I ($P \cap I = \emptyset$), and since these notions are exhaustive, every world is either possible or impossible ($P \cup I = W$). As in the standard model, a relation of accessibility R holds between elements of W, $R \subseteq W \times W$. The fact that W includes logically impossible worlds entails that some worlds are inaccessible from possible worlds. Importantly, this does not affect the non-modal truths of the actual world, for as long as one considers the valuation (v) of formulas in possible worlds, nothing changes. All standard propositional connectives (as well as modal operators) are defined as they are in the original model.

What does change is that not every world is logically possible. This means that there are worlds where the valuation of formulas is different than in possible worlds. After all, logically impossible worlds are worlds where the logic of the actual world (presumably, classical logic) does not hold. Thus, even though A is true in a given impossible world, that does not have to

[4] Some have distinguished four notions of impossible worlds, which differ with respect to how broad the domain of worlds is meant to be (Berto and Jago 2019, pp. 31-2). Compared to other notions, the one mentioned above is a moderate one. Thus, for heuristic reasons, I will rely on this characterization.
[5] Some call elements of I non-normal, non-standard, or n-worlds (Kripke 1965; Rescher and Brandom 1980; Priest 1992; Paśniczek 1994).

entail the falseness of $\sim A$ in the same world. Furthermore, since some worlds are governed by many-valued logics, v is not restricted to only truth and falsity anymore. There are worlds and formulas such that a given formula is both true and false or neither true nor false in those worlds. Again, this does not affect the truth-values of formulas at possible worlds, where the principle of bivalence holds, and where each formula is either true or false.

Logical impossibilities are not the only ones that are realized in impossible worlds. Thus, there are also mathematically or metaphysically impossible worlds. These are worlds where some of the mathematical or metaphysical truths of the actual world fail to hold.[6] It is crucial, however, to bear in mind that when determining the modal status of a given expression in the actual world, we should not be misled by the contingency of semantical facts. This should help to clarify what we mean when we say that it is impossible for 2+2 not to equal 4:

> [There is a sense in which] '2+2=4' might be false. The phrase '2+2' and '4' might be used to refer to two different numbers. One can imagine a language, for example, in which '+,' '2,' and '=' were used in the standard way but '4' was used as the name of, say, the square root of minus 1, as we should call it, '*i*.' Then '2+2=4' would be false, for 2 plus 2 is not equal to the square root of minus 1. But this is not what we want. We do not want just to say that a certain statement which we in fact use to express something true could have expressed something false. We want to use the statement in *our* way and see if it could have been false. (Kripke 1971, p. 182)

The above shows, that there is a sense in which everything is possible. Accordingly, it may seem that there is no need for introducing impossible worlds in the first place. This sense,

[6] Here I assume that the truths of mathematics and metaphysics are necessary. For a view opposite to this see (Rosen 2006; Miller 2009).

however, is not the one that is the subject of interest here. For if one wonders what would happen if ‘2+2=4’ were false, one does not wonder about a situation where language works differently, but rather about a situation where mathematics is different. The first one is a possible situation. The latter is an impossible one. An explanation of such genuine impossibilities is the main aim of EPWS and motivation for the extension of the original PWS.

2. Australasian and North American Worlds

While there is general agreement that impossible worlds are worlds where the laws of classical logic fail to hold, this simple description allows for further specifications. What differentiates them partly depends on what one considers the logical structure of impossible worlds, or whether all of them have such a structure in the first place. In this respect, there are two approaches, which – due to the nationality of some of their advocates – have been labeled Australasian and North American (Priest 1997).[7]

The first one has it that impossible worlds are contradictory situations or sets of propositions that are closed under the logical consequences of one of the non-classical logics (Brandom and Rescher 1980; Paśniczek 1994; Beall and Restall 2006, p. 50). While this is usually a paraconsistent logic (Mares 1997; Restall 1997), one is not necessarily limited to that, which leaves room for worlds with other non-classical logics as well (Priest 1992). Hence, every world is ruled by some logic, but only some of them are governed by classical logic. Besides the set of worlds where classical logic is valid, W also includes some sets of worlds where one of the non-classical logics hold. In this sense, while not all worlds are logically possible, all of them have structures, which are determined by given logical consequences. Since the truth-values of formulas are restricted to worlds which truths are governed by a given logic, the fact that there is an impossible world where $A \wedge \sim A$ is true does not affect the truth-

[7] As a list of advocates of these approaches shows, the mentioned labels may be misleading. Nevertheless, I am going to stick to the terminology introduced by Priest.

values of formulas as applied to the actual world. Again, this is what makes them logically impossible worlds. Since they are inaccessible from the actual world, their laws do not affect the non-modal truths of our world.

The above is based on the assumption that the actual world – as well as other possible worlds – is ruled by classical logic. This, however, is a matter of debate. After all, some believe that some contradictions are actually true or that some propositions are neither true nor false. None of them would like to claim that the actual world is impossible though. Hence, one ought to generalize the Australasian view by claiming that regardless of what the correct logic *L* of the actual world is, impossible worlds are worlds where a logic different than *L* holds.

While the Australasian approach allows for a significant extension of possible worlds semantics, it might still not be rich enough. Alternatively, one may characterize impossible worlds simply as worlds where classical logic does not hold. In that case, there is no need to assume that there is some other logic that holds in them. After all, it seems that there are impossibilities that slip out of any logic whatsoever. If worlds semantics are meant to provide a model for propositional or intentional attitudes, one should find room for a world where no logic holds. After all, one can deliberately be committed to the claim that this is truly so. Thus, to do justice to the richness of the spectrum of propositional attitudes, advocates of the North American approach allow for worlds where no logical laws hold whatsoever (Vander Laan 1997; Priest 2005/2016; Jago 2014; Berto and Jago 2019).

The second argument against the Australasian approach concerns counterpossibles (Nolan 1997, p. 547-8; Priest 2005/2016, p. 190; Berto and Jago 2019, p. 176). If one wonders about the consequences of the failure of a given logical law, one usually expresses this in terms of a counterfactual. Many of them can be analyzed in terms of the Australasian approach. Thus, in this picture, there is room for worlds where the law of excluded middle or the law of non-contradiction fails. After all, that is what Australasian worlds are. None of them, however, is a world where *no* logic is true. In virtue of this, there is no world which would correspond to the following counterpossibles:

> (1) 'If there were no true logic, there would be some principles for which there is no counterexample,'
>
> (2) 'If there were no true logic, there would be no true logic.'

If there were no worlds corresponding to the above antecedents, neither of them would satisfy CF. Thus, neither of them would be true. This is questionable, especially in the case of the second counterpossible, which is an example of a counterfactual self-entailment, i.e., a counterfactual of the form *A*>*A*. Such counterfactuals are commonly considered necessarily true.

Due to the above, some believe that the domain of impossible worlds should be in some sense unrestricted and also contain non-structured worlds:

> (Am1) I think the most plausible principle for impossible worlds is that for every proposition which cannot be true, there is an impossible world where that proposition is true. (Nolan 1997, p. 542)

> (Am2) Every nonempty collection of propositions is the book on some state of affairs or another, even those collections which are nothing more than a haphazard assortment of propositions with no unifying principle at all. (Vander Laan 1997, p. 604)

> (Am3) Everything holds at some worlds, and everything fails at some worlds. (Priest 2005/2016, p. 187)

(Am4) If A and B are distinct formulas, there are worlds where A holds and B fails. (Priest 2005/2016, p. 192)

While this 'North American' postulate has been formulated in various ways, it seems that all of them reduce to the claim that – assuming worlds are correlates of formulas – every non-empty set of formulas corresponds to a world.[8] If the elements of the set obey the laws of classical logic, it corresponds to a possible world. Otherwise, it corresponds to one of the impossible worlds. This includes worlds that are governed by one of the non-classical logics, as well as worlds where no logic holds. The first group is a group of worlds that are closed under a given relation of consequence. The second one is a group of worlds that are not closed under any relation of consequence. Accordingly, members of the first one are often called 'closed worlds' and those of the second – 'open worlds' (Priest 2005/2016, p. 20). In virtue of this, the domain of impossible worlds extends between a world which contains a single formula which is true or false to the trivial world which includes every formula and in which all of them are true.

Once restrictions are put aside, one may raise the worry of whether such a liberated picture does not lead to problems. There are two reasons to believe that there are some. The first one is concerned with a material question and the second with a formal question. Consider an example of formula (PI): 'This world is both logically possible and impossible.' Since there are worlds, and since sets P and I have no common part, (PI) is false. Furthermore, it is necessarily false, for if one accepts the framework of worlds semantics, it is impossible for (PI) to be true. This may suggest that it is true at some of the impossible worlds. If this were the case, then there would have to be a world w_{PI} where the mentioned formula is true. World w_{PI} would have to be one which is both possible and impossible, and we know that no world satisfies that description.

[8] In order to avoid nuances between various North American approaches, and to unify the terminology, I will assume that truthbearers are formulas and that truthmakers are states. Accordingly, a formula A is true in a given world w if the corresponding state s_A obtains in w. Likewise, formula B is false in w if s_B is an element of w, and does not obtain in w.

This may seem not to be a challenge. After all, the mere fact that there is a world where 'A round square exists' is true does not entail the truth of that at the actual world. Likewise, the truth of 'According to Doyle's novel, Holmes lived in London' does not commit us to the actual truth of 'Holmes lived in London.' Nevertheless, both cases commit us to believing something. In the former case, it is the existence of an impossible world where a round square exists; in the latter one, it is the existence of a novel (Rosen 1990, p. 338). Thus, while PI being true at w_{PI} does not entail the truth of PI in the actual world, it requires us to believe in the actual truth of (PI') 'There is a world which is both possible and impossible.' Just as an actual truth of 'It is impossible for a round square to exist' commits one to the actual truth of 'There is a world where a round square exists.' The key difference between these two worlds is that, while the latter is an element of W, w_{PI} finds no room in the domain of worlds. Thus, either it is not the case that for every formula, there is a world where this formula holds, or it is actually true that some worlds are both possible and impossible. Both consequences are questionable from the North American perspective.

One way of overcoming this problem is to understand the notion of 'truth in world w' as a story prefix – 'truth according to world w.' In virtue of this, while there is no w_{PI}, there is an impossible world w_{PI*}, and *according to* w_{PI*}, this world (w_{PI*}) is both possible and impossible. The existence of w_{PI*} does not commit us to believing in the actual truth of (PI'), but merely in the truth of (PI''): 'There is an impossible world w_{PI*}, according to which that world is both possible and impossible.' Thus – an advocate of this strategy will claim – while there is a world where PI holds, that does not commit us to the truth of (PI').

The truth of PI'' does not entail the truth of PI' only if w_{PI*} is *wrong* about itself, i.e., only if w_{PI*} is *not* both possible and impossible, but merely says so about itself.[9] This raises the question of whether PI holds at w_{PI*} after all. Following counterfactual analyses of expressions

[9] This interpretation is related to the notion of 'unreliable narrators' (Nolan 2007).

containing the story prefix, the truth of 'According to w_{PI*}, w_{PI*} is both possible and impossible' is grounded in the truth of the corresponding counterfactual:

(PI*$_{CF}$) 'If w_{PI*} were the actual world, the actual world would be both possible and impossible.'

Since w_{PI*} is wrong about itself, there is no reason to accept the truth of the counterfactual. After all, it is not the case that w_{PI*} is both possible and impossible. Thus, it is not the case that w_{PI*} is a world where PI holds. Compare this to a possible novel, where a character – due to hallucinations – reports: '… and then my desk lamp started dancing.' While this hallucination is a part of the story, it is not true that according to this novel there is a dancing lamp. Otherwise, the mentioned report would be veridical and not a result of hallucination.[10]

The above shows that either (PI) is true at w_{PI} or there is no world where (PI) is true. In the first case, one commits to a false claim, which has it that some worlds are both possible and impossible. In the second case, one ought to justify the exclusion of (PI) from the set of formulas that hold at some world and fail at others. Such an exclusion also affects the unorthodox analysis of counterpossibles, for instance:

(3) 'If there were a world which is both possible and impossible, then the set of both logically possible and logically impossible worlds would not be empty.'

Since the antecedent of (3) is true at none of the possible or impossible worlds, (3) does not satisfy CF, which makes it not true. Intuition, however, tells us that (3) should be true.

The second problem concerns the formal counterpart of the above question. One of the formulations of the North American approach has it that 'If A and B are distinct formulas, there are worlds where A holds and B fails.' Thus, since A and $\sim\sim A$ have different structures, these

[10] The above relies on the popular assumption that the story prefix should be understood in terms of counterfactuals. Thus, it should be notice that this argument may be less convincing for those, who favor an alternative analysis of this prefix (Bonomi 2008; Predelli 2008).

are different formulas, and there is a world where one of them holds and the other fails to hold. While this allows us to provide a very fine-grained picture of worlds, one may raise the question of whether this is not too fine-grained. Consider, for instance, $A \wedge B$ and $B \wedge A$. Since these are of a different structure, there should be a world where the first one holds and the second fails to hold. If that were the case, then conjunction would not be generally commutative, and each of these formulas would require different truth conditions. Likewise, since the formulas $\forall xFx$, $\forall yFy$, and $\forall zFz$ differ in their syntactic structure, there should be a world where one of them holds but the others do not. It is not clear, however, that the mere *syntactic* structure of the formulas mentioned above is sufficient to consider only one of them true and the rest false.[11]

Furthermore, even though A and A are of the same syntactic structure, on the assumption of (Am3), one may doubt whether they are indeed identical. Assuming that 'Everything holds at some worlds, and everything fails at some worlds,' there should be a world where the law of identity ($A \vdash A$) holds and a world where it fails to hold. Since the law of identity has it that if A holds, A holds, a world where this law fails is a world, where A holds and where A fails to hold at the same time.[12] Belief in such a world is questionable, for if A holds at a given world, then it is not the case that A fails to hold. The mentioned world where the law of identity fails to hold seems to violate this assumption.

Some characterize the North American approach along with a qualification which excludes the law of identity from the set of formulas or logical principles that hold at some world and fail to hold at others (Berto and Jago 2019, ch. 8.4.). Thus, it is claimed that this law fails to hold at no world. This stipulation – while being plausible – lacks justification and goes against the initial motivation for the North American approach. For if an acceptance of this

[11] See also (Bjerring and Schwarz 2017).
[12] Notice that this is different than the case of an impossible world where both A and $\sim A$ holds. These kinds of worlds find their place in both Australasian and North American approaches.

approach aims to overcome the limitations of Australasian view, one may still query the truth-value of the counterfactual:

(4) 'If the law of identity failed to hold, *A* would hold and fail to hold at the same time.'

Since no world corresponds to the above counterpossible, (4) does not satisfy CF and thus it is not true.

In virtue of the above, what initially seemed to be an essential advantage over the Australasian approach may lead to questionable consequences. This leaves an advocate of EPWS with a choice between a limited, Australasian approach and an unlimited, yet controversial, North American approach. One way of addressing this problem may be to bite the bullet and commit to worlds where $A \vdash A$ fails to hold or where it is the case that a world is both possible and impossible. For if *every* formula is meant to hold in some worlds and fail in others, there have to be such worlds after all (Priest 2005/2016, p. 245; Sylvan 1995, p. 55).

This, however, would require ascribing different meanings to at least one of the key terms of EPWS, such as 'being true at a world,' 'being possible,' 'being impossible,' 'holding at a world,' etc. Given that the notion of an impossible world stipulates that no world is both possible and impossible, allowing for some worlds to embody both attributes would either create tension with the mentioned assumption or necessitate a different understanding of impossibility. In this sense, even if there were a world that satisfies the characterization 'a world which is both possible and impossible,' it would not truly be a world simultaneously possible and impossible; rather, it would be a world where the mentioned expressions have different meanings. Similarly, a world where $A \vdash A$ fails to hold would be a world where *A* both holds and does not hold. To allow for such a world, one would have to understand 'holding' in a way that, despite it being true that *A* holds, it would also be true that *A* fails to hold. If this were the case, then the mentioned characterizations could be equally well satisfied by possible worlds. Just as it is possible for ‘2+2=4’ to be false, provided that we ascribe a different meaning to that expression than the one that it has in the actual world. This, however, is not what we have in mind when trying to provide a model for impossibility. Otherwise, one would not have to believe in impossible worlds in the first place.

Those who share the worries mentioned above may seek a third way – one which is not as restricted as the Australasian approach and not as liberal as the North American approach. Since it is supposed to be between the two, let’s call it the Pacific approach. This ought to put some restrictions on what counts as an impossible world yet allow for the inclusion of more than what the Australasian approach does. As in any other case where limits are to be introduced into a theoretical framework, they should satisfy two conditions – (i) being well-motivated and (ii) justifying the exclusion of the questionable cases without limiting the explanatory power of the initial account. The following section aims to show that the Pacific approach satisfies both. To do so, I will turn to the methodological aspect of PWS.

3. Pacific Approach

One of the aims of possible (and impossible) worlds semantics is to provide a model or a formal interpretation of a part of natural language, namely modal expressions. The question of whether it is an adequate model depends on its ability to explain data. The data, in this case, is reflected – among others – in semantic puzzles concerning examples of counterfactuals with merely possible and impossible antecedents. To succeed in this goal and to address these puzzles, theoreticians developed a complex yet powerful theoretical framework, which is built upon some technical notions, such as ‘possible world,’ ‘impossible world,’ ‘truth in a world,’ ‘being accessible,’ ‘being similar,’ ‘holding in a world,’ etc. Furthermore, these notions have been characterized in detail, which aims to guarantee the precision, accuracy, and coherence of this framework. Depending on the given account, these detailed characterizations are statements such as ‘no world is both possible and impossible,’ ‘no entity exists in more than one world,’ ‘every world is a possible world,’ ‘some worlds are impossible,’ ‘some worlds are incomplete,’ etc. In virtue of this, one may explain in detail how we should understand CF and why it is meant to be an adequate model for analyzing counterfactuals. This is done by interpreting or paraphrasing statements containing the modal terms of a natural language into the framework of the semantics of possible and impossible worlds. The following is an example of such a paraphrase:

(P) It is possible that *p* iff there exists a world *w*, and *p* is true at *w*.

The left side consists of a natural language expression containing the modal term ‘possible,’ which is then paraphrased on the right side into a more refined notion of being true at a world. Similarly, the analysis of counterfactuals is presented in terms of being true at a world and the relationship of similarity between worlds. In this sense, the theoretical language of PWS (and EPWS) provides tools for interpreting natural, everyday language. This makes the former the metalanguage of the latter.

While the above observation is not novel it will help situate and justify some of the restrictions to be introduced in this section. Consider four formulas, which – in virtue of the North American approach – are true in one world or another:

(1) ‘Donald Trump lost the election in 2016.’

(2) ‘Donald Trump is a prime number.’

(3) ‘Nothing is true.’

(4) ‘Every formula is neither true nor false.’

The first one is true at a possible world (w_1) where corresponding state s_1 (Donald Trump lost the election) obtains; the second is true at an impossible world (w_2) where corresponding state s_2 (Donald Trump is a prime number) obtains. Accordingly, one should conclude that the third one holds in what David Vander Laan called a ‘null state of affairs,’ i.e., a world w_3 where

‘Nothing is true’ is true (Vander Laan 1997, p. 604). This naturally raises a problem, for if this is right, a world where nothing is true would be a world where something is true, namely ‘Nothing is true.’ Furthermore, since every world where (3) is true is a world where *something* is true, this results in the truth of the counterpossible ‘If nothing were true, something would be true,’ which seems false. Likewise, (4) should hold in w_4, i.e., in one of the extreme worlds, where ‘Every formula is neither true nor false’ is true. This leads to a similar worry as the one concerning w_3, for w_4 would be a world where every formula is neither true nor false, and where at least one formula – namely (4) – is true. Hence, what seems to be a false counterfactual, ‘If every formula were neither true nor false, at least one formula would be true’ is actually true.

The above shows that either there is no world where nothing is true or it is a mistake to consider (3) and (4) on equal terms with (1) and (2). Since the first option would lead to a limited picture of impossible worlds, I am inclined to lean towards the second horn of this dilemma. This naturally calls for a justification for the discrepancy between the analysis of (1) and (2), on the one hand, and the analysis of (3) and (4) on the other. What might be a good starting point is the observation that while the first two are expressed in an everyday, object language, examples (3) and (4) contain a metalinguistic notion of ‘being true.’ As paraphrase (P) shows, this notion is an element of the theoretical framework in which a natural, object language is meant to be analyzed or interpreted. Thus, to consider (3) and (4) the same type of data as (1) and (2) is to change the subject of the framework from a natural, object language to the language of the framework itself. In virtue of this, the expectation of finding room for worlds where (3) or (4) is true is not merely unjustified but – as Alfred Tarski (1936) showed – may lead straightforwardly to the paradox of self-reference. Because of this, expressions that contain terms taken from the metalanguage should not be considered data for the framework of worlds semantics. At least not on an equal footing with those that are built exclusively out of the terms of the object language.

If the above is plausible, then the Pacific characterization of the domain of worlds might be formulated in a way that restricts it to formulas expressed in an object language:

> (Pac.) For every formula of an object language and for every truth-value, there is a world where this formula has this truth value and a world where it does not have it.

The question of whether there is a substantial difference between the Pacific and the North American approach partly depends on what we consider a formula that holds or fails to hold at a world. While advocates of the North American approach will consider (3) and (4) to be such formulas,[13] an advocate of the Pacific approach will exclude them for containing metalinguistic terms.

4. Truths and Worlds

As usually happens when a restriction is introduced, there is a theoretical price to pay. What may seem to be a grave cost of accepting the Pacific approach is that it radically narrows the domain of worlds and thus limits the explanatory power of world semantics. If, due to containing metalinguistic terms, there were no worlds in which (3) or (4) is true, there should be no worlds where 'paraconsistent logic is valid' is true or 'conjunction elimination fails to hold' is true. This – assuming the primary motivation for EPWS – would put into question the very idea of introducing impossible worlds. After all, many examples of counterpossibles seem to include terms taken from the metalanguage, e.g., 'If paraconsistent logic were valid, some contradictions would be true.'

There is, however, a way for the Pacific approach to include a world where nothing is true as well as a world where paraconsistent logic is true or a world where conjunction elimination fails to hold. To do so, one should notice that it is one thing for a world to be such

[13] E.g., some approaches allow for formulas such as '*w* is the actual world' or 'nothing is true' to be evaluated as true or false within a given world (Vander Laan 1997).

that no formula is true at it, and it is another thing for a world to be one where the formula 'Nothing is true' is true. This requires further discussion on the distinction between truth-at-world and truth-about-world.

4.1. Truth-at-world

The notion of truth-at-world should be familiar to readers of classical works in the semantics of modalities and can be elaborated upon in several ways.[14] Here, I propose that worlds are sets of states (truthmakers), which are ontological correlates of formulas (truthbearers) of the object language. Additionally, influenced by some Meinongian motivations, I assume that each state has either a positive ontological status of existing/obtaining/subsisting or a negative ontological status of non-existing/non-obtaining/non-subsisting. Accordingly:

> A formula A is true at a world w iff a corresponding state s_A is an element of w and has a positive status.
>
> A formula A is false at a world w iff a corresponding state s_A is an element of w and has a negative status.

It should be noted that the mere fact that A is true at w does not entail the falsity of $\sim A$. Since A and $\sim A$ are distinct formulas, they have different correlates (truthmakers). Similarly, $A \land B$ is distinct from A, implying the existence of a world where the former is true but the latter is not. This truthmaking framework rejects the Thesis of Entailment, asserting that, just as atomic formulas are correlated with atomic states, complex formulas are made truth by complex states.[15] Accordingly every truthmaker becomes what Kit Fine terms the 'exact truthmaker' (Fine 2017, p. 558).

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[14] See Plantinga (1976).

[15] While this may raise some worries, it also has some justification. For debates over properties of truthmaking see Restall (1996), Read (2000), Rodriguez-Pereyra (2006); Jago (2009), Tałasiewicz et al. (2013), Fine (2017).

One consequence of this perspective is a fine-grained depiction of worlds, including both possible and impossible worlds. Assuming that possible worlds are ontological correlates of sentences closed under the classical consequence relation, impossible worlds are correlates of sentences not satisfying this condition. Accordingly, impossible worlds are either correlates of sentences governed by non-classical logics or arbitrary sets of correlates of sentences. [16]

In virtue of this what makes (1) true at w_1 is that it is a world where the state of Donald Trump losing the election in 2016 has a positive ontological status, i.e., it obtains (or exists). Likewise, A not being true is determined by the fact that an adequate state s_A does not obtain (or does not exist). Notice that as soon as one introduces incomplete and inconsistent worlds, the mere fact that s_A does not obtain does not entail that $s_{\sim A}$ obtains. After all, some worlds are incomplete; hence there is a world w, and there are states of affairs s_A and $s_{\sim A}$, such that neither of them obtains in world w. Thus, neither A nor $\sim A$ is true at w. Accordingly, the world where nothing is true is not a world where a state that makes 'Nothing is true' true obtains, but rather a world where none of the states of affairs that are elements of this world obtain. This is what truly makes it the empty world, i.e., such that no formula is true within it (Nolan 1997, p. 555).

Quite a similar strategy applies to other questionable cases. Consider the following examples:

(5) 'Conjunction elimination is invalid.'

(6) 'Paraconsistent logic is true.'

Since arguments for believing in impossible worlds also support believing in worlds where conjunction elimination is invalid (w_5) or where paraconsistent logic is true (w_6), the Pacific approach should find room for such worlds as well. Again, this leaves open two options. The first one is treating them as cases similar to (1) or (2). Accordingly, w_5 and w_6 would be worlds such that 'Conjunction elimination is invalid' is true at w_5, and 'Paraconsistent logic is true' is

[16] For a detailed exposition of the truthmaking theory rejecting the Thesis of Entailment, see Sendłak (2022).

true at w_6. The second option is to consider w_5 a world where for some A and B, even though $A \wedge B$ holds, either A or B fails to hold. Likewise, w_6 is a world where for some formulas A and B, $A \wedge \sim A$ holds, but B does not. Upon comparing these two approaches, the second one appears to be more plausible. After all, when one considers what would happen if a given law $A \vdash B$ were not valid, one is interested in the situation where A holds but B fails to hold rather than the situation where the expression '$A \vdash B$ fails to hold' is true. For, as Kripke's example of '2+2=4' being false shows, these are two different scenarios. Furthermore, the second one can be realized even in a possible world.

4.2. Truth-about-world

Like truth-at-world, the notion of the truth *about* the world also finds various interpretations.[17] I intend to approach this by considering Humean supervenience. Let us remind that this view (often called 'the Best System Account,' or 'BSA') concerns the nature of the laws of nature. Its core can be expressed as the conjunction of three claims:

> i) All there is to the world is a vast mosaic of local matters of particular fact, just one little thing and then another (see Lewis 1986: ix).
>
> ii) Laws are the general axioms of whichever summary best balances simplicity and strength [in describing the mosaic] (see Lewis 1973, p. 73).
>
> iii) The balance is determined by how things are in the world (see Lewis 1994, p. 478).

BSA is meant to be the alternative for those accounts that analyse the notion of laws in modal terms. Importantly, even if we do not define laws of nature in modal terms, we can easily explain what nomic necessity is by indicating that just as there is a set of logically possible

[17] See e.g., Adams (1981), Fine (1985), Williamson (2013).

worlds, there is also a set of nomologically possible worlds. The first set contains worlds, where the logic of the actual world is valid, and the second contains worlds where the laws of nature of the actual world hold. Or to put this differently, the second set contains worlds such that the best generalization of their mosaics is the same as the best generalization of the actual mosaic. At the same time, there is no need to assume that all logically possible worlds are also nomologically possible, i.e., there is (in a logical space) room for a world, where water freezes at 10° C. This, however, is a world where the mosaic importantly differs from the one of the actual world. Thus, even though in virtue of BSA, laws are meant to be merely the best summaries of the mosaic, it is quite clear that the same laws can hold in different worlds. After all, there is no reason to assume that a world where Paris is the capital of Spain is a world where the laws of nature of our world are violated.

Accordingly, a law concerning the mosaic built out of perfectly natural properties is a generalization that (i) takes into consideration the distribution of natural properties within a world and (ii) satisfies the standards of goodness (i.e., it balances simplicity and strength in a better way than alternative descriptions do). As some argue, this can be expressed as a function f_L, where 'P' stands for natural properties, 'd(w)' stands for the distribution of these properties in the world w, and 'b' for the standards of goodness. The image of this function is a law concerning the distribution of natural properties within a world, L(P, w):

$$f_L\text{:(P, d(}w\text{), b)=L(P, }w\text{)}$$ (Schrenk 2023).

Importantly, since laws of nature are not limited to merely the fundamental laws of physics, one ought to introduce a change within what counts as the mosaic. Thus, to explain the laws of biology or chemistry, a change within P in f_L is required. Such extended analysis of laws is often called the Better Best System Account (BBSA). This – as advocates argue – allows one to avoid the debate over the naturalness of properties and turns the original account into one that is not limited to merely fundamental laws, for it allows P to be e.g., biological, or chemical properties (Schrenk 2007; Cohen and Callender 2009). Whereas BSA assumed that the mosaic is built out of fundamental properties, BBSA also allows for mosaics to build out of non-fundamental yet still natural (i.e., chemical, biological, etc.) properties. While both BSA and BBSA focus on natural laws, I believe that this Humean picture can be extended to further kinds of dependence. The only change that is required is to allow for different types of 'mosaics.'

Consider, for example, logical entailment. Paraphrasing the above Humean assumptions, we can say that

> i*) All there is (in the logical sense) to the world is a vast mosaic of truthbearers and truth-values, just one little thing and then another.
>
> ii*) Laws of logic are the general axioms of whichever summary best balances simplicity and strength in describing the mosaic.
>
> iii*) The balance is determined by how things are in the world.

In this sense, the core of the Humean approach toward laws of nature can be generalized in the cases of other examples of dependence, including logical consequence. The proposed extension ought to allow for the mosaic to be built out of other kinds of entities. In the case of entailment, these are truthbearers, in the case of mereological supervenience these are parts and wholes, in the case of causation these are events, etc. Thus, the f_L function can be generalized into:

$$f_D\text{:(M, d(}w\text{), b)=D(M, }w\text{).}$$

In virtue of the above, the dependence (D) holds between elements of the mosaic (M) if D is the best description of the distribution of elements of M within a world *w*.

Accordingly, it is true of (or, about) a world *w* that a logic *L* holds in it if the relation between formulas that are true within *w* is best summarized by the laws of *L*. This results in a Humean picture, where the truth about a world supervenes on the mosaic of the world (truths at a world). Thus, we can say that a world *w* has the property of being a world of classical logic if its elements are best described by classical logic. Accordingly, if a world w is such that A and B are true at w but $A \wedge B$ is not, the best description of the mosaic of this world is that conjunction introduction is invalid in this world. [18]

The way in which the Pacific approach addresses the question of impossibilities that explicitly contain metalinguistic terms is to consider them not being true (or holding) *within* a world but being true *about* a world. While – by definition – no formula is true within the empty world, many formulas are true about the empty world, e.g., that nothing is true at it, that it is not the actual world, that it is not a possible world, etc. Likewise, it is true about w_5 that conjunction elimination is invalid in that world, but (5) is not true within w_5. The reason for this is that it contains the metalanguage notion of 'being valid,' and thus it is not among the formulas that are elements of a world.

This distinction allows one to justify the exclusion of a world where the law of identity of formulas fails to hold or a world which is both possible and impossible. Since (PI) contains metalinguistic terms, it is a something which may be true or false about a world but not within it. Since being a possible world is being accessible from the actual world, and being impossible is being inaccessible, no world in the domain satisfies this condition; thus, there is no world about which it is true that it is both possible and impossible. Likewise, if by the failure of the law of identity we mean that both A holds and A does not hold, then there is no world about which it is true that the law of identity fails to hold in it. After all, if A holds in w, then it is not the case that it fails to hold.

As the above shows, truths about w depend upon what is true at w. A consequence of this is that if A is true at w, then it is true about w, that A is true within this world (or, w has a

[18] The proposed perspective requires acceptance of Humean supervenience in the first place. Like many other philosophical positions, the latter is by no means uncontroversial (Bhogal 2020a). Thus, debates surround the notion of natural properties (Dorr 2019), the explanatory power of such an account of the laws of nature (Lange 2018; Emery 2019; Hicks 2020), and the risk of falling into idealism due to the standards of balance established by human beings (Lewis 1994; Hicks et al. 2023). However, my intention is not to defend this view here but rather to explore its potential application to the question of the laws of logic.

property of being a world, where A holds). Let us use '{A}-w' as expression of 'w has a property of being a world, where A is the case.' Accordingly '{A}-w' is true iff either formula A is true at w or A expresses a dependence relation that holds within w (A(M, w)). This helps to formulate the following truth criteria for counterfactuals:

> (CF*): $A>C$ is true at a given world w iff a {A, C}-w' is more similar to the w than any world {A}-w* which is not a {C}-w*.

5. Costs and Consequences

What makes the Pacific approach a middle way between the Australasian and North American approaches is that formulas such as (5) and (6) are reduced to a relation between formulas that are true at a given world. The North American component has it that the domain of worlds goes without any restriction beyond structured worlds and also includes arbitrary sets of formulas of the object language.

5.1. Mosaic and Laws

This simple picture may be questioned because of what the nature of the laws of logic within the Pacific approach is. Since laws are merely the best descriptions of the mosaic, why couldn't we say that every world is structured? After all, regardless of how arbitrary the set of formulas is, it is plausible to assume that it can be described in one way or another. And some of those descriptions will be better than others. Accordingly, each world would be a world of some structure. And this would turn the Pacific approach into the Australasian one.

The reason this does not hold is that not every accurate description of the mosaic counts as a law. To qualify as a law, a description must be a *summary* (or a generalization) that satisfies the conditions of a balance between simplicity and strength. Accordingly, while a complete description of the mosaic might accurately depict a given world, since it is not a summary, it should not be considered a law. Here, I assume that 'summary' means presenting the main points, ideas, and key information of the mosaic in a concise form. Thus, while each mosaic can have a corresponding description, not all of them should count as a law, as some are not summaries but rather full descriptions. Consequently, some mosaics are free of laws.

It should be stressed, however, that there is also a sense in which every world is closed under some consequence relation, and thus *every* world is structured. After all, every world is a world where the law of identity holds. Hence, to be more precise, I should say that it is possible for there to be a mosaic without any *non-trivial* law. It seems that a similar assumption is necessary for the North American approach. Since there is no world where the law of identity fails to hold, every world is a world where it holds; thus, no world is *absolutely* 'open.' This puts both the Pacific and the North American approaches susceptible to similar objections. Yet, a notable difference arises between these approaches concerning the law of identity. Advocates of the latter consider it an exception to the claim that everything holds or fails in some world. This may rise the question about the lack of clarity regarding why the identity law is treated within the North American approach differently from other logical laws. Meanwhile, the Pacific view justifies this by grounding laws in the mosaic, where no mosaic (world) can simultaneously encompass something as a part of it and fail to do so. Thus, while both views maintain that the law of identity holds in every world, the North American approach introduces this as an *ad hoc* provision, whereas the Pacific approach offers a justification for this exception.

Since the Pacific approach relies on BSA, it naturally incurs some criticism that has been leveled against it. One such criticism questions whether it is possible for the same mosaic to 'produce' different laws (Tooley 1977; Carroll 1994). Advocates of Humeanism answer this in one of two ways. The first is to assert that this is impossible due to the nature of the relation between the mosaic and laws (Loewer 1996). The second is to argue that this is – for various reasons – indeed possible (e.g., Roberts 2008; Carroll 2018; Bhogal 2020b). I lean towards the second option and believe that this possibility is supported by the context-sensitivity of explanation (van Fraassen 1973; de Regt and Dieks 2005). Given that what counts as the best generalization may vary depending on the context, it is reasonable to hold that, along with the change in the context of explanation, the criteria of balance may also change. Once f_D is considered a general picture of BSA, this possibility is justified by allowing for the same mosaic (i.e., the domain and distribution of its elements) to have different best summaries.[19] Thus, it is not only possible for there to be a mosaic without laws, but it is also possible for a single mosaic to be a source of different laws.

While BSA is a respected position within the debates on the laws of nature, the applicability of the mosaic metaphor to the laws of logic may come into question. Setting aside broader issues concerning the nature of the mosaic (i.e., what is the subject of logic) or our knowledge of it,[20] I want to focus on a problem that is distinctive for the Pacific approach. This concern revolves around the idea that the Pacific approach inverts the relationship between logical laws and the world (mosaic). One might expect that the way the world is, should be a consequence of the logical laws, which are somehow universal and span all possibilities, rather than the logical laws being a consequence of how the world is.

This problem of the direction of dependence dates back to an old debate over the question of the source of logic, i.e., whether logic transcends the world or is rooted within it. The former is often linked with Bertrand Russell's viewpoint, while the latter with Ludwig Wittgenstein's perspective (Almog 1989; Raven 2020). In this context, the Pacific approach aligns itself essentially with Wittgensteinian philosophy. This doesn't inherently make it superior or inferior to the alternative; each stance comes with its own set of advantages and disadvantages. I take that what could support the Russellian view is that it seems to fit better with the necessity of

[19] This opens a new perspective on the debate over logical pluralism and revives an old problem of nomic idealism. Both deserve substantial discussion, yet both go beyond the scope of this paper.
[20] See e.g., Hack (1977), Resnik (1999), Boghossian (2010), Shapiro (2010), Rush (2014), McSweeney (2019), Peregrin (2024).

the laws of logic. Since the shape of the mosaic is contingent, it may seem that the Pacific approach entails contingency of the laws of logic are such as well. This surely would be a good reason to reject it and lean towards the opposite, Russellian view.

Yet, Pacific approach allows saving the necessity of logic. All we need to assume here, is that there is a set of worlds, where the same logic holds. Thus, what makes logic *L* holding at the actual world, is that this provides the best generalization of the logical mosaic of the actual world. What makes this necessary, is that the actual world is an element of set of other worlds where the same *L* holds. These worlds differ in terms of the details of the mosaic, but all of them share the same generalization of their mosaics. That is what makes them logically possible. The fact that *w* is logically impossible means merely that *w* does not belong to the same set of worlds as the actual world does.

5.2. Object Language and Metalanguage

Given that the Pacific approach is partly based on the distinction between the object language and the metalanguage, one may argue that this may lead to a confusion. After all expressions such as 'being satisfied,' 'being possible,' 'being valid,' 'world,' or 'similarity' belong both to the object and metalanguage. This being said, it should be noticed that the distinction is of a semantic and not of a syntactic nature. In virtue of this, the actual world is a world where 'Mick Jagger is not satisfied' is true, but there is no world where 'This formula is not satisfied' is true. What makes these cases different is the meaning one ascribes to the key term. In the first case, 'satisfaction' stands for the fulfillment of one's wishes, expectations, or needs. In the second, it has a more refined, technical meaning, which applies to formulas and not to individuals.[21] Or to put this differently, there are two oophonic lemmas 'being satisfied.' One of them belong to

[21] Likewise, it is justified to say within the object language that 'The team of Apollo 11 achieved the impossible – they landed on the Moon,' but it is not true that there is no possible world where this happened. This is because the meaning of 'possible' within folk language is often taken as having the same meaning as 'being probable.' In contrast, within possible world semantics, there is no such correlation.

the object language and may apply to humans. The second belong to the metalanguage and apply to formulas. Similar discrepancies take place in the case of other key philosophical terms, where the technical meaning that is ascribed to them often differs from their ordinary, everyday meaning.[22]

In this context, the object language is our everyday, folk language, whereas the metalanguage is a language of our theory that is meant to explain the former. The former is often vague and imprecise, making it an insufficient tool to address philosophical puzzles formulated within it. The latter performs this task significantly better. Thanks to a precise meaning of key terms and clear theses, assumptions, or axioms, a given framework delivers a solution to (or at least a clarification of) puzzles formulated in everyday language. Usually, this is done by paraphrasing expressions of the folk language into expressions of the language of philosophical theories. Therefore, we can say that any framework (i.e., theoretical language) containing precisely defined, technical terms such as 'worlds,' 'transworld identity,' 'state of affairs,' 'proposition,' and so on, is a language that describes or gives an interpretation of everyday language, which is itself insufficient in explaining certain puzzling phenomena. This includes questions concerning modal terms.

5.3. Counterfactuals

Once theoretical restrictions are imposed, there is a risk of losing the explanatory power of the framework. While this might very well apply to the Pacific approach, at least a large part of what is considered data for counterfactuals is addressed. That applies to both the standard examples such as 'If whales were fish, they would have gills' as well as to those that explicitly use metalinguistic terms: 'If conjunction elimination were not valid, it would be the case that,

[22] For the debate over the plausibility and the role of a distinction between theoretical and common meanings of philosophical terms such as 'being,' 'object,' 'existences,' etc., see Hirsch (2008), van Inwagen (2008), Sider (2011, pp. 171-3), Sendłak (2020).

for some *A* and *B*, $A \wedge B$ but it would not be the case that *A* or would not be the case that *B*.' The key difference between those cases is that since the latter contains metalinguistic terms, it should not be analyzed as straightforwardly as the first one.[23]

Since the Pacific approach puts some constraints on impossible worlds, this raises a question concerning the truth-value of those counterfactuals whose antecedents do not find room in the domain of impossible worlds, e.g.,

> (7) 'If the law of identity failed to hold, there would be a world where for some *A*, *A* holds, and *A* fails to hold.'
>
> (8) 'If the law of identity failed to hold, the law of identity would fail to hold.'
>
> (9) 'If there were a world that was both possible and impossible, there would be a counterexample to excluded middle.'
>
> (10) 'If the laws of logic were not axioms of the best summary of the distribution of truth values, round squares would be green.'
>
> (11) 'If classical logic were valid and an instance of the law of excluded middle had failed, logic would be useless.'

Since none of the above satisfies (CF*), none of them is true. This leaves three options. The first one is to consider them false. This might be controversial in the case of (8), which is an example of an $A>A$ counterfactual. The second one is to consider them neither true nor false. For the same reason as in the previous case, this option does not seem satisfactory either. What is left is to lean towards a third, quasi-orthodox solution, that is, consider them true and to modify (CF*) into

[23] This duality allows also for the analysis of a mixed examples such as: 'If conjunction elimination were invalid and grass were purple, things would be very different.' The antecedent of this counterfactual is represented by such a world *w* that (i) 'Grass is purple' is true *at w*, and (ii) 'Conjunction elimination is invalid' is true *about w*.

(CF**): A>C is true at a given world *w* iff there is a {A, C}-*w*', which is more similar to the *w* than any world {A}-*w** which is not a {C}-*w** *or* there is no {A}-world.

I believe there is some methodological support for this. Notice that if any of the above antecedents were true at any world, it would render the Pacific approach implausible. For assuming a world with the antecedent of any of (7)-(11) is to reject any view inconsistent with it, including the Pacific approach.

This is especially clear in the cases of (10) and (11). The truth of (10)'s antecedent would require us to assume the falsity of the core assumption of the Pacific approach, i.e., BSA interpretation of laws of logic. Likewise, the truth of the antecedent of (11) indirectly entails the falsity of the same BSA assumption. After all, the truth of this antecedent would require us to assume a case where a given world both is and is not a world where a given logic holds. In other words, it would be a situation where a given description both is and is not the best summary of the mosaic. Since no inconsistent description can be considered good, there is no world that satisfies this. Thus, either a world *w* is ruled by a given logic *L*, or not. If it is ruled by *L*, then it is not a world where laws of this logic are violated. If laws of logic *L* are violated at *w*, then this is not a world ruled by *L*.

Furthermore, what makes (10) and (11) somewhat different from (7)-(9) is that their subject is the framework of the Pacific approach itself. Thus, to expect a non-vacuous truth or falsity of such examples is to (i) turn the framework towards itself, and (ii) expect that this very framework will indicate any interesting (i.e., non-trivial) consequences of its own implausibility. However, if we counterfactually assume that the theory, which we believe to be true, is false, then there is no need to believe that reasoning based on it should lead us to anything other than triviality. While (10) and (11) are different from (7)-(9) since their subject is the framework itself, all the above-mentioned examples share the same feature. This is the feature of having antecedents that (either directly or indirectly) require assuming the falsity of the framework within which they are meant to be analyzed.[24]

While (CF**) makes some counterfactuals vacuously true, it doesn't have to be thought of as spelling failure for unorthodoxy. This may instead be understood as showing that relative to the limitations of orthodoxy and the Australasian view on the one hand, and the questionable consequences of the North American approach on the other, CF** provides a balanced proposal. The price to pay for this is to agree to the vacuous truth of counterpossibles such as (7)-(11). And that – I believe – is still a reasonable price.

[24] It seems that the same methodological observation applies to other accounts of counterfactuals, including the orthodox approaches (Sendłak 2016). Thus, since neither the Australasian nor the North American approaches allow for a world where the law of identity fails to hold, examples such as (7) and (8) should turn vacuously true. For arguments stressing the need for a non-vacuous analysis of examples such as (11), see Sandgren and Tanaka (2020).

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