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The Open Future, Bivalence and Assertion

Anandi Hattiangadi and Corine Besson

[Forthcoming in *Philosophical Studies*]

Abstract

It is highly intuitive that the future is open and the past is closed—whereas it is unsettled whether there will be a fourth world war, it is settled that there was a first. Recently, it has become increasingly popular to claim that the intuitive openness of the future implies that contingent statements about the future, such as ‘there will be a sea battle tomorrow,’ are non-bivalent (neither true nor false). In this paper, we argue that the non-bivalence of future contingents is at odds with our pre-theoretic intuitions about the openness of the future. These are revealed by our pragmatic judgments concerning the correctness and incorrectness of assertions of future contingents. We argue that the pragmatic data together with a plausible account of assertion shows that in many cases we take future contingents to be true (or to be false), though we take the future to be open in relevant respects. It follows that appeals to intuition to support the non-bivalence of future contingents is untenable. Intuition favours bivalence.

1 Introduction

It is highly intuitive that the future is open while the past is closed; that the future is unsettled, whereas the past is settled.¹ For example, it seems to be unsettled now whether the glaciers in the Swiss Alps will melt away within a century, whereas it is now settled that dinosaurs once roamed the earth. It is intuitively unsettled whether there will be a fourth world war, while it is intuitively settled that there was a first world war. Our intuitions about openness or unsettledness are typically triggered by a subclass of future contingent statements: namely, statements about the future that are metaphysically neither necessary nor impossible. Not all contingent statements about the future trigger intuitions of unsettledness: ‘I will die someday’ is a contingent, future tensed sentence, but the proposition it expresses is intuitively settled. However, ‘there will be a fourth world war’ and ‘the glaciers in the Swiss Alps will melt

¹ This is admittedly just to exchange metaphors with metaphors. Be that as it may, we will use ‘settled’ and ‘unsettled’ as synonymous with ‘closed’ and ‘open.’

away within a century' are paradigm cases of future contingents that are now intuitively unsettled. Henceforth, we will restrict our attention to that sub-class of future contingent propositions that trigger intuitions of unsettledness.

Reflections on the open future have generated considerable debate about the semantics of future contingents.² Central to the debate about future contingents is the question whether future contingents are neither true nor false, and hence constitute exceptions to the law of bivalence:

Bivalence: Every proposition p is either true or false.

Let us say that 'Open Future-compatibilism ('OF-compatibilism') is the view that the openness of the future is compatible with the bivalence of future contingents, and that 'Open Future-incompatibilism' ('OF-incompatibilism') is the view that the openness of the future is incompatible with the bivalence of future contingents.³ The OF-incompatibilist maintains that if the future is open, then future contingents are neither true nor false. More precisely, for a future contingent proposition, p , and a time, t , the OF-incompatibilist maintains that:

OF-incompatibilism:

If it is unsettled whether p at t , then p is neither true nor false at t .

The OF-compatibilist holds, in contrast, that future contingents are bivalent, and hence that it can be unsettled whether p at t , and nevertheless true that p at t .

² The debate originates with Aristotle's discussion in *De Interpretatione*, section IX. For a good overview of the recent debate, see Torre 2011.

³ OF-compatibilists, on our definition, include: Barnes & Cameron 2009, Lewis 1987, Prawitz 2009, von Wright 1979. OF-incompatibilists include: Belnap 1992, Belnap & Green 1994, Brogaard 2008, Diekemper 2004, Kölbel 2008, MacFarlane, 2003, 2007, Markosian 1995, Prior 1957, Ryle 1953. The terms 'OF-compatibilism' and 'OF-incompatibilism' are borrowed from Torre 2011, though Torre defines OF-compatibilism as the view that the open future is compatible with the determinate truth/determinate falsity of future contingents. Thus, Barnes and Cameron 2009, who preserve bivalence, but claim that future contingents are neither determinately true nor determinately false come out as OF-compatibilists on our view, but OF-incompatibilists on Torre's view.

In this paper, we will argue that OF-incompatibilism is at odds with our pre-theoretic intuitions about the open future. Drawing on the plausible, orthodox account of assertion, we will show that OF-incompatibilism makes false predictions about our pragmatic judgments concerning the correctness and incorrectness of assertions of future contingents, while OF-compatibilism is better able to explain the data. Since our pragmatic judgments reflect our pre-theoretic semantic intuitions, our results show that only the view that future contingents are bivalent is compatible with our pre-theoretic judgment that the future is open. Thus, any account of the openness of the future which fails to preserve the bivalence of future contingents runs against intuition.

Our paper will be organized as follows. In the next section, we will argue that to adjudicate between OF-compatibilism and OF-incompatibilism, we need a theoretically neutral starting point to establish what we intuitively take the openness of the future to amount to. We claim that such a starting point is provided by our pragmatic judgments concerning the correctness and incorrectness of assertions of future contingents. In section 3, we present the data which supports OF-compatibilism over OF-incompatibilism. In section 4, we offer replies to some objections.

2 Motivations for OF-incompatibilism about Future Contingents

Why might one think that the open future intuition implies that future contingents are non-bivalent? A familiar line of reasoning seems to support this view. Suppose that Alice asserts, on Monday:

(1) It will be sunny in London tomorrow.

Now, suppose that Hugo witnesses Alice's utterance of (1), and considers whether it is true. Given his intuition that the future is open, i.e., unsettled, Hugo might reason as follows:

- (2) It is not settled today whether it will be sunny in London tomorrow.
- (3) Alice said that it will be sunny in London tomorrow.
- (4) If it is true that it will be sunny in London tomorrow, then it is true today that it will be sunny in London tomorrow.
- (5) If it is true today that it will be sunny in London tomorrow, it is already settled today that it will be sunny in London tomorrow.
-
- (6) So, what Alice said is not true.

By parity of reasoning, he can also conclude:

- (7) What Alice said is not false.

And by (6) and (7) he can further conclude that:

- (8) What Alice said is neither true nor false

The open future intuition, that it is not settled today whether it will be sunny in London tomorrow, occurs in line (2). The conclusion, in line (8), is that what Alice said is neither true nor false. Given that this is an arbitrary example, it follows that future contingents are non-bivalent.

Let us examine the premises more closely. Line (3) seems to be undeniable: if Alice asserts the sentence ‘It will be sunny in London tomorrow’, what she says is that it will be sunny in London tomorrow. Line (4) seems to be undeniable as well. Even if one thinks that some propositions are only temporarily true, and that an utterance of ‘it is sunny’ expresses a proposition that is true at one time and false at another, the proposition expressed by (1) is that it will be sunny on a particular day in London, and if this proposition is true, it is true once and for all. Some philosophers might deny (4) on the grounds that propositions cannot be true or false at times. For instance, they might claim that the proposition that *everything is self-identical*, though true, is not true at any particular times, because it would be odd to say something like ‘the proposition that *everything is self-identical* was true yesterday’. But, by the same token, it would be odd to say ‘the proposition that *everything is self-identical* was not true yesterday’, which is true, according to the view under consideration. Hence, it makes

better sense to explain the oddity of these utterances in terms of the vacuity of the temporal modifier, which is vacuous not because *everything is self-identical* is not true at any particular time, but because it is true at all times.

Line (5) is more interesting, because a generalized version of (5) is equivalent to the OF-incompatibilist's thesis. The OF-incompatibilist says that if it is unsettled whether p at t , then it is neither true nor false that p at t . A generalized version of (5) says that if a future contingent proposition p is true (false) at t , then it is settled whether p at t . Clearly, the generalized version of (5) is logically equivalent to the OF-incompatibilist's thesis. This means that, this line of reasoning *assumes* that the unsettledness of the future implies the non-bivalence of future contingents. However, we are looking for an independent reason to think OF-incompatibilism is correct. So, let us consider a few possible ways in which one might endorse OF-incompatibilism.

2.1 'Open' Means 'Non-Bivalent'

Some philosophers have suggested that 'open' just means 'non-bivalent'.⁴ For instance, one might simply *stipulate* that to say that the future is open at some time t is to say that there are some propositions about the future relative to t that are neither true nor false at t .⁵ This, of course, would be too quick for present purposes. Merely stipulating that openness entails non-bivalence does not give us any reason to think that the stipulation captures our pre-theoretic intuitions. Let us say that the concept open* is such that if the future is open*, future contingents are non-bivalent. The question is whether open* is our intuitive concept of openness.⁶ Moreover, given that OF-compatibilists deny that future contingents are non-bivalent, to define openness in terms of non-bivalence is question-begging.

2.2 Substantive Accounts of Openness

Another strategy is to appeal to a substantive physical or metaphysical account of time, and argue that the preferred account implies that future contingents are non-bivalent. Now, this

⁴ Cf. Diekemper 2004, MacFarlane 2003, and Markosian 1995.

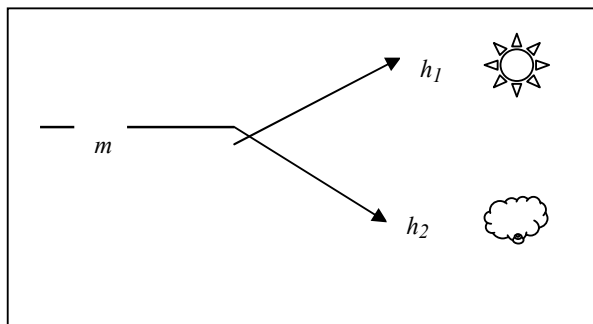
⁵ This definition is adapted from Markosian 1995. Note, however, that Markosian's purpose is not to defend non-bivalence on the basis of this stipulative definition, but to raise a difficulty for OF-incompatibilism.

⁶ Barnes and Cameron 2009 make this complaint as well.

strategy might be successful if there are independent grounds for preferring one such account of time over others. For example, if the Everett interpretation of Quantum Mechanics turns out to be true, and the best metaphysical basis for the Everett interpretation entails that future contingents are non-bivalent, we will have good, independent grounds for thinking that future contingents are non-bivalent.⁷ However, it is a further question whether any such theoretically motivated account of time captures the intuition that the future is open. If, as we will argue, only the view that future contingents are bivalent is compatible with pre-theoretic intuitions about openness, then a theoretically motivated account of time that entails non-bivalence is at odds with the intuitive view of the open future. Anyone who subscribes to OF-incompatibilism is committed to an error theory concerning our pragmatic judgments concerning assertions of future contingents.

However, some OF-incompatibilists make the further claim that their favoured substantive metaphysical theory of time also best captures our intuitive, pre-theoretic view that the future is open. For example, in some moods, MacFarlane suggests that the best way to capture our pre-theoretic intuitions about openness is given by the metaphysical picture of time according to which time is like a rootless tree with multiple branching future histories, which are ontologically on a par (see *Figure 1*).⁸

Figure 1



In *Figure 1*, m is a moment through which both h_1 and h_2 pass, and the arrowheads indicate the direction of time. Suppose that m is on Monday, and Alice utters (1) at m , and suppose

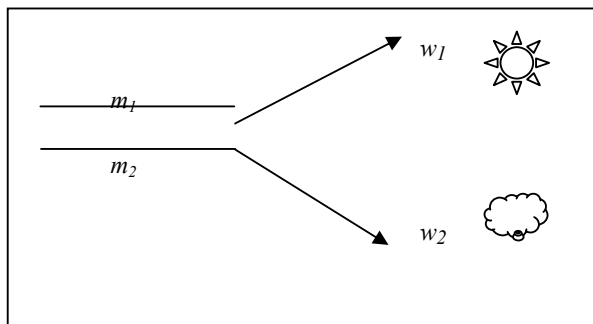
⁷ See Wallace 2010 for discussion.

⁸ In other moods, like Markosian 1995, MacFarlane suggests that the open future intuition directly entails that future contingents are non-bivalent, subsuming both the open future hypothesis and the denial of bivalence under the ‘intuition of indeterminacy’. See MacFarlane 2003: 322.

that it is sunny on h_1 but not on h_2 . According to this theory, the proposition that *it will be sunny in London tomorrow* is neither true nor false at m , because for it to be true at m that *it will be sunny in London tomorrow* is for it to be true on all histories that pass through m , and whereas it is true on h_1 , it is not true on h_2 (MacFarlane 2003, 2008).

To put an alternative view on the table, consider David Lewis' account of openness, according to which the asymmetry in openness between the future and the past is understood in terms of the asymmetry in counterfactual dependence.⁹ Lewis' picture can be represented by *Figure 2*:

Figure 2



On this picture, w_1 and w_2 are metaphysically possible worlds, which are duplicates of one another from the past to the point at which the arrows diverge; w_1 contains moment m_1 and w_2 contains a counterpart moment, m_2 ; at w_1 it is sunny in London on the day after Alice's utterance, and at w_2 , it is not. According to Lewis, the multiple futures are alternative ways the world would have been had the present been different from the way it actually is. The future is open in the sense that the future counterfactually depends on the present, and the present on the past, but the past is closed in the sense that the past does not counterfactually depend on the present. Our intuitions about openness are thus explained in terms of our readiness to accept the truth of counterfactuals describing how the future would be had the present been different. For instance, if Hugo says at m_1 , 'if the wet weather headed for Scotland were diverted south, it would not be sunny in London tomorrow', we would take him to have said something true. On the standard interpretation, what Hugo says is true because there is a world, w_2 , which is just like w_1 with respect to the time prior to m_1 , but at

⁹ See Lewis 1987.

which it is not sunny. In assessing the truth of this counterfactual, we standardly hold fixed as many particular facts about the past as is compatible with the counterfactual supposition that the present is other than it actually is.¹⁰ The crucial point is that on Lewis' view, statements about the future, such as (1) are bivalent: if Alice occupies w_1 , then what she says is true, and if Alice occupies w_2 , then what she says is false.

How can we decide which of these substantive accounts is better at capturing our pre-theoretic intuitions? MacFarlane argues that Lewis' account of openness is unsuccessful because his view does not capture what he calls the 'indeterminacy intuition': that future contingents are non-bivalent.¹¹ However, this objection to Lewis is question-begging—we do not yet have an independent reason to think that openness intuitively entails non-bivalence.

MacFarlane also suggests that Lewis' account does not capture 'genuine openness' because Lewis does not accept that we inhabit multiple actualities.¹² Similarly, Barnes and Cameron claim that it is a desideratum for any account of genuine openness to imply that there are actually now multiple possible ways our future could turn out to be.¹³ However, such desiderata are already theoretically loaded; since Lewis does not accept that there are multiple actualities, and nevertheless purports to capture openness, it is question-begging to simply *characterize* the intuitive notion of openness using the metaphysical theory that we occupy multiple actualities. Moreover, it is difficult to believe that the intuitive concept of openness, shared by those who are unschooled in philosophy, commits us to a sophisticated metaphysical doctrine such as the multiple actualities view. Once again, we could stipulatively introduce the concept open* and insist that the future is open* only if we inhabit multiple actualities. However, this would give us no reason to think that open* is our intuitive concept of openness, and it is unclear why OF-compatibilists should be interested in open* unless it is the intuitive concept of openness.

¹⁰ This standard method of interpretation falls apart when we consider backtracking counterfactuals such as 'had it not been sunny today, it would have been rainy yesterday', which we do not know how to process unless given further information. Lewis argues that although we are willing to accept backtracking counterfactuals if we are given sufficient information to evaluate them, we are not willing to accept such counterfactuals when we employ our standard analysis. Thus, the asymmetry of openness is preserved on Lewis' view within ordinary contexts.

¹¹ MacFarlane 2003: 326.

¹² MacFarlane 2003: 326.

¹³ Barnes & Cameron, forthcoming.

What we need, therefore, is a theoretically neutral starting point, which does not presuppose a sophisticated metaphysical theory, yet gives us some grip on the pre-theoretic intuition that the future is open, but the past is closed.

3 Pragmatic Data

Our starting point will be pragmatic data: in particular, our intuitive judgments concerning the correctness and incorrectness of assertions of the relevant sub-class of future contingent propositions. This data is theoretically neutral in the sense that it does not presuppose either OF-incompatibilism or OF-compatibilism. However, in conjunction with the orthodox account of assertion, the data reveals that we are intuitively committed to OF-compatibilism. The upshot is that the OF-incompatibilist will need to opt for a non-standard account of assertion or find some other way to explain our intuitions away. We present the orthodox account in this section, and discuss potential rejoinders on behalf of the OF-incompatibilist in the next section.

According to orthodox accounts of assertion, correct assertion requires at least truth. Thus a norm of assertion is a truth norm (or a stronger norm which entails a truth norm), such as the following:

Truth Norm:

You ought to: assert that p only if p is true.¹⁴

This norm of assertion plays an explanatory role in communication: speakers of a language make the conventional assumption that an assertion of a proposition is correct just in case the

¹⁴ With respect to all of the assertion norms referred to here, we assume that ‘ought’ takes wide scope over the conditional. The reason for this is that it is the orthodox formulation (see e.g. Williamson, 2000). It is also often claimed that the knowledge norm entails the truth norm. However, note that the wide scope formulation of the norms does not uncontroversially permit entailment from the knowledge norm to the truth norm. If the assertion norms are wide scope, in order to derive the truth norm from the knowledge norm, it would be necessary to accept the principle that $O(p \rightarrow q) \& q \rightarrow r$, then $O(p \rightarrow r)$, which is controversial in deontic logic. This minor difficulty can be overcome. The knowledge norm and the truth norm are related in the following way: necessarily, if one satisfies the knowledge norm, it follows that one satisfies the truth norm. Though we will continue to adopt the standard practice of talking as if the knowledge norm entails the truth norm, what we mean is that satisfaction of the knowledge norm entails satisfaction of the truth norm.

proposition asserted is true. So, if we hear an assertion of a proposition we know to be not true, we will judge the assertion to be incorrect.¹⁵ The truth norm is also frequently appealed to in accounts of what is communicated by utterances. Sometimes, when we judge that an assertion would be incorrect if interpreted literally, we instead assign a true proposition to the sentence asserted in order to preserve the correctness of the assertion. For example, suppose that Becca says:

(9) The glass is full.

Suppose also that there is a tiny little bit of space between the top of the liquid in Becca's glass and the top of the glass. It follows that what (9) literally says is false. Nevertheless, most people will take Becca to have said something true. The reason is that we know that Becca is a cooperative speaker, aiming to convey information in accordance with the conventional norms of correct assertion, and that she too knows that it is obviously false that the glass is literally full. Thus, we work back from the assumption that her assertion is correct, to the conclusion that she could not have meant that the glass is literally full; she must have meant that the glass is full enough.

This link between pragmatic and semantic judgments can be exploited to give us information about our semantic judgments: given the truth norm of assertion, we judge assertions to be correct only if we take them to be true.

Now, let us return to the OF-incompatibilist's view. According to the OF-incompatibilist, at least in those cases in which we intuitively take the future to be open, we take future contingents to be neither true nor false. If we take future contingents to be neither true nor false, then we take them to be not true. Assuming the truth norm of assertion (or a stronger norm which entails it), this view predicts that we will judge assertions of future contingents to be incorrect, at least in those cases in which we take the future to be unsettled in relevant respects. This inference is supported by other cases in which we regard assertions to be incorrect because they express propositions that are neither true nor false, or because they fail to express propositions at all. For example, consider a case where a demonstrative

¹⁵ This kind of explanation originates with Grice 1989, though it is now widespread in both linguistics and philosophy of language.

fails to pick out anything at all. Suppose Maya says ‘that elephant is pink’ but there is nothing picked out by ‘that elephant’. Most people would regard this as an incorrect assertion, presumably because it fails to express a proposition.

So, OF-incompatibilism, together with orthodox accounts of assertion, predicts that we will judge assertions of future contingents to be incorrect. However, most of the time, we are willing to accept sincere, flat-out assertions of future contingents as correct.¹⁶ Consider the following cases.

First, suppose that Addy is ready to go out for a run, but she is waiting for the babysitter, who is due to arrive in 10 minutes. Her babysitter has never before been late. Although, as all mothers know, any number of factors could interfere to cause delay, she has no positive reason to think that any such interference will occur. Addy says:

(10) I will go running in 10 minutes.¹⁷

Second, suppose that Barbara is a Fellow of the Royal Meteorological Society, with a degree in Environmental Science, who works as a weather presenter for the BBC. Her record for predicting the weather one day in advance is very good, though of course, she is aware that it is possible that the weather will change in an unpredictable way. After checking her data carefully, she goes on the air and asserts:

¹⁶ The Of-incompatibilist might point out that we very often hedge our statements about the open future, and prefer not to make flat-out assertions. For instance, we more often say ‘I think that it will be sunny tomorrow’, or ‘it is likely to be sunny tomorrow’ than ‘it will be sunny tomorrow’. Perhaps we hedge because we judge future contingents to be non-bivalent. Though it is true that we often hedge, the fact that we sometimes make flat-out assertions about the open future, and that we sometimes judge these assertions to be correct is sufficient for our purposes. The prevalence of hedging would only support OF-incompatibilism if we were never willing to make flat-out assertions of future contingents, or if we were only willing to make flat-out assertions of future contingents in those cases where we regard the future to be settled (as in ‘I will die someday’). However, the cases that follow are examples of flat-out assertions that we would judge to be correct and yet where we judge the future to be open in relevant respects.

¹⁷ We are assuming that this is not an expression of intention, but a straight assertion. If that is difficult to imagine, suppose instead that Jonathan says, of Addy, ‘she will go for a run in 10 minutes’.

(11) It will be sunny in Madrid tomorrow.

Under the circumstances just described, it seems natural to regard the assertions of (10) and (11) as correct. Yet, we do not think that it is closed or settled that Addy will go running in 10 minutes. Despite judging (10) to be correct, we think that the future is open rather than closed with respect to Addy's running. That is, we think that there are alternative ways the future might be with respect to Addy's running; even if it is now true that she will go for a run, it is possible that she won't. Similarly, though we judge (11) to be correct, we do not think that the future is closed with respect to the weather in Madrid—everyone knows how sensitive weather systems are to change. Even if it is now true that it will be sunny in Madrid tomorrow, it is certainly possible that it will not be sunny, and however much evidence Barbara may have for the truth of what she says, it is neither fixed nor certain that it will be sunny in Madrid on the day after the day of her utterance. Yet, we regard Barbara's assertion as correct.

If we do judge assertions of these future contingents to be correct, and if we assume that assertion is constituted by a truth norm, it follows that we take the propositions stated in assertions of (10) and (11) to be true. But if we also regard the future as unsettled in the relevant respects, then it follows that we do not in general take the openness of the future to imply that future contingents are not true. Thus, the OF-incompatibilist makes false predictions about our intuitive pragmatic judgments.

Of course, there are situations in which we regard assertions of future contingents to be incorrect. For example, if Alice asserts (1) with no evidence, we are inclined to regard her assertion as incorrect. Similarly, the following assertions look incorrect, if they are made (say) on 31st of December 2011:

(12) It will be sunny in London on March 3rd 3014.

(13) There will be a fourth world war.

Do these cases support OF-incompatibilism, or show that the pragmatic data is inconclusive? After all, in these cases too, we regard the future to be open in relevant respects. So, one

might think that the pragmatic data just does not decide either way. However, given the orthodox view of assertion, OF-incompatibilism also suggests an explanation of why we regard such assertions as incorrect—because they are neither true nor false.¹⁸ But this explanation of why we regard these assertions as incorrect is not borne out. If this were the reason why we regard these assertions to be incorrect, then it would be natural to give that reason when challenging the assertion. Yet, the most natural way to challenge (13) would be to say one of the following:

- (14) Are you sure? There might not be a fourth world war.
- (15) You don't know that there will be a fourth world war.

In contrast, it would be distinctly odd to challenge (13) by saying the following:

- (16) It is neither true nor false that there will be a fourth world war.

(16) is just an odd thing to say in English. Only a philosopher would say (16)—indeed, only an OF-incompatibilist. But if it followed from our judgment that the future is open or unsettled that future contingents are non-bivalent, or even if non-bivalence was merely offered as an explanation for those judgments, we would expect (16) to sound more natural. Moreover, the oddity of (16) cannot be explained by the hypothesis that we do not typically find it natural to use the ‘neither true nor false’ locution in English, since we would find it natural to use similar locutions in cases of vagueness, for instance. Indeed, as Ripley has shown, in the case of vagueness, speakers are often willing to accept outright contradictions, of the form ‘ x is both F and not- F ’ as well as disjunctions such as ‘ x is neither F nor not- F ’.¹⁹ However, these would not sound right in the case of future contingents, either.

Perhaps, one might think, the ‘neither true nor false’ locution sounds odd here, but that we would find it natural to say that a future contingent is not true, and to say that it is not

¹⁸ We discuss alternative accounts of assertion in section 4.

¹⁹ See Ripley, forthcoming.

false. Similarly, *pace* Ripley, one might think that it is natural to say ‘‘Jones is bald’’ is not true’, and to say ‘‘Jones is bald’’ is not false’, but think that it is odd to say ‘‘Jones is bald’’ is neither true nor false’.²⁰ However, in the present context, this cannot be the correct explanation of the oddity, because it makes no sense to challenge an assertion of (13) by saying the following:

(17) It is not false that there will be a fourth world war.

It hardly seems like a challenge to say that an assertion is not false – indeed (17) is compatible with (13). In contrast, (18) sounds like a more natural challenge:

(18) It is not true that there will be a fourth world war.

However, if one were to challenge an assertion of (13) by asserting (18), one would lay oneself open to the following challenges:

(19) Are you sure? It might be true that there will be a fourth world war.

(20) You don’t know that it is not true that there will be a fourth world war.

The reason for this seems to be that in asserting (18), the speaker commits herself to knowing, or at least justifiably believing, that there will not be a fourth world war. Assuming that our current epistemic situation is insufficient to justify a belief one way or the other, then the challenge in (18) would be on as shaky epistemic ground as the assertion of (13).

It seems that, assuming an orthodox account of assertion, the OF-incompatibilist cannot explain the data concerning the correctness and incorrectness of assertions of future

²⁰ This view seems to follow from Barnes and Cameron’s account 2009. We discuss their view briefly in note 23.

contingents, and challenges to them.²¹ Our view is that the best explanation of this data is that not only must the norm of assertion entail the truth norm, it must contain an epistemic component as well.²² This is strongly suggested by the challenge data. In (14), the challenger claims that the speaker is not in a position to rule out the alternative epistemic possibility in which there is no fourth world war, and again in (15) the challenger points to lack of knowledge or justification on the part of the speaker. Furthermore, the incorrectness of the challenge in (18) can be explained by the assumption that the speaker of (18) is, by hypothesis, in the same poor epistemic situation as the speaker of the assertion she is challenging. This suggests that the correct norm of assertion must be either the knowledge norm or the justified true belief norm:

Knowledge Norm:

You ought to: assert that p only if you know that p .

Justified True Belief Norm:

You ought to: assert that p only if p is true and you justifiably believe that p .

Both these norms entail the truth norm,²³ and both of them can explain the relevant data. In the case of the correct assertions of (10) and (11), the explanation of our judgment is that we regard them to be true, and regard the speaker to be in a position to know or at least have a justified true belief in the proposition asserted. In contrast, in the cases of incorrect assertion,

²¹ Notice that these objections from challenges just leveled against the truth norm would not work against the factual norm (you ought to (assert ‘ p ’) only if p). In principle, an OF-incompatibilist could endorse the factual norm (or a stronger norm that entails the factual norm but does not entail the truth norm) and accept excluded middle while rejecting both bivalence and standard disquotation schemas. On this view (1) would be neither true nor false but would still state a determinate fact, and an assertion of (1) would be governed by a factual norm and so would be assertible. This view would avoid the objections concerning the correctness of assertions raised above against OF-incompatibilism. However, if this were the correct view, one would expect it to be natural to challenge assertions of future contingents in the material mode—which it is not. So, for instance, one would expect it to be natural to challenge the assertion of (13) with ‘there will not be a fourth world war’ or ‘there neither will be nor won’t be a fourth world war.’ However, these challenges in the material mode sound just as odd as those in the semantic mode. Thanks to Oystein Linnebø for discussion.

²² Cf. Pérez Otero 2010.

²³ More precisely, the conditions that constitute satisfaction of the knowledge norm constitute satisfaction of the truth norm. See note 16.

such as (12) and (13), we regard the speaker to be in a poor epistemic situation, whether or not the proposition asserted is true.²⁴

Which of these two norms offers the best account of assertion? On our view, it is the knowledge norm. Now, one might not feel at ease with a knowledge norm of assertion for future contingents: one might want to say that although some future contingents are assertible, because one's justification for them is strong enough, no future contingent is really knowable. So, one might think it more fitting to adopt a weaker norm of assertion in terms of justified true belief. However, the knowledge norm need not be so demanding. For instance, according to the contextualist (e.g. Cohen 1986, DeRose 1991, Lewis 1996), whether it is true that *S* knows that *p* depends on features of the salient context. In ordinary contexts such as those described above, a relatively low level of evidence is required for knowledge, or a small subset of alternative possibilities needs to be ruled out. Hence, the contextualist would say that Addy and Barbara both know what they assert. In conjunction with the knowledge norm, it follows that both assertions are correct—which coheres with our pragmatic judgments. Similarly, according to the subject sensitive invariantist (e.g. Hawthorne 2004, Stanley 2005), the evidence required for knowledge depends on how high the stakes are: in low stakes situations, the evidence required for knowledge is relatively low. In conjunction with such a view of knowledge, the knowledge norm is not too demanding, so it implies that both Addy and Barbara know what they assert, and hence, it correctly predicts that their assertions are judged to be correct.

Though both the knowledge norm and the justified true belief norm can deal with the above cases, there are further examples of assertions of future contingents that the knowledge norm is better able to explain. For instance, the knowledge norm better explains our intuitions in lottery cases. Suppose that Paula owns a lottery ticket in a lottery with one million tickets, and suppose that the winning ticket will be chosen in the future. Given the large number of tickets in the lottery, there is a high probability that Paula holds a losing ticket. Nevertheless, we would find the following assertion incorrect:

(21) Paula will not win the lottery.

²⁴ For a defence of the knowledge norm and a discussion of both the knowledge norm and the justified true belief norm, see Williamson 2000.

Our pragmatic intuition about this case is better explained by the knowledge norm than the justified true belief norm. If we assume that justification for (21) is merely probabilistic, and that (21) is true, the assertion of (21) comes out as correct according to the justified true belief norm. The knowledge norm, in contrast, deems the assertion of (21) as incorrect, because the future contingent proposition asserted is not known at the time of assertion, which conforms better to our judgments.²⁵ Though a full defense of the knowledge norm over the justified true belief norm is beyond the scope of this paper, future contingent lottery propositions speak are better explained by the knowledge norm. Hence, we favour the knowledge norm in this context, since it provides the best overall account of the data.²⁶

Though appeal to an epistemic norm of assertion helps to explain the data, it does not follow that what it is for the future to be open is for it to be epistemically uncertain or unknown. After all, we sometimes judge assertions about the past to be incorrect, and thereby open to challenge, even though we regard the past as settled. For example, in our current epistemic context, it would be incorrect to assert:

- (22) Caesar ate grapes on the day he crossed the Rubicon.
- (23) Dinosaurs experienced unusual qualia.

In both of these cases, the intuitive incorrectness can be explained by our poor epistemic situation, together with an epistemic norm of assertion. Since both (22) and (23) are intuitively settled, we cannot simply understand the intuition that the past is closed as the intuition that we are in a better position to know about the past.

These remarks do not amount to an analysis of our intuitive concept of openness. However, they do shed some light on that concept. They suggest that our intuitive view that the future is open does not commit us to the view that future contingents are non-bivalent.

²⁵ See Hawthorne 2004 on the knowledge norm and the lottery paradox. See Perez Otero 2010 for further discussion on the knowledge norm in relation to future contingents.

²⁶ Future contingent Gettier cases also speak in favour of the knowledge norm over the justified true belief norm. We are grateful to an anonymous referee for pointing this out.

Indeed, our pragmatic judgments reveal that we frequently regard contingent statements concerning the open future to true.²⁷

Moreover, when we do not regard assertions of future contingents to be correct, this is because, in these cases, we take the speaker to be in a poor epistemic situation with respect to the assertion in question, not because we take the proposition asserted to be not true. Thus, assuming a standard style of account of assertion, any substantive account of openness that preserves bivalence seems to better capture our intuitive concept of openness than any account that entails non-bivalence. Indeed, any account of openness that entails non-bivalence seems to be forced to adopt an error theory about a wide range of pragmatic and semantic intuitions.

4 Objections and Replies

There are various ways in which the OF-incompatibilist might respond to the foregoing arguments. In what follows, we consider and reject a number of potential responses.

²⁷ This is why merely preserving bivalence without declaring some propositions as true (and some as false) will not suffice to meet our objection. For instance, Barnes and Cameron (2009 and forthcoming) claim that every proposition is either true or false, but with respect to some propositions, it is indeterminate which truth-value they have. According to them, for every point in time at the actual world, there is a set of possible worlds that represents the way the future of the world might be, consistent with its past up to that point in time. They call this set {Futures} and they treat the worlds in {Futures} as precisifications of the present state of the actual world. They claim that though it is determinate that one of the worlds in {Futures} will be actualized, it is indeterminate *which* of them will. So, on their view, if Alice asserts (1) today, and if it is sunny in London tomorrow at some worlds in {Futures} but not at others, then what Alice says is not determinately true and not determinately false. However, they maintain that all of the worlds in {Futures} are maximal and classical, so that at each world, every proposition is either true or false. Hence, today, it is determinately true that what Alice says is either true or false, because it is determinately true that one of the worlds in {Futures} will be actualized.

This view cannot avoid the foregoing objections. Our pragmatic judgments reveal that we do not just take future contingents to be bivalent, but that in some cases at least, we take them to be true. If we did think that future contingent propositions were bivalent, but that it was indeterminate which truth value they had, then we would take assertions of future contingent propositions to be either correct or incorrect depending on which truth value they turned out to have. But we do not; we take them to be true, at least in some cases, even though we take the future to be open in relevant respects.

4.1 Alternative Accounts of Assertion

One response might be to reject the orthodox view that assertion is governed by a truth norm, or a norm that entails the truth norm. For instance, one might think that assertion is governed by a weaker norm, such as the following:

Belief Norm:

You ought to (assert that p) only if you believe that p is true.

If the sincere belief norm governs assertion, then we can explain the correctness of assertions (10) and (11) in the relevant contexts: If the speaker believes the proposition asserted to be true, then the assertions will be correct. And the speaker can believe them to be true, even if they are neither true nor false.

One difficulty with this response is that a speaker might also believe (12) and (13), yet these do not seem to be correctly assertible.²⁸ Another is that this response is of no use to OF-incompatibilists who accept that some assertions of future contingents are correct. Suppose that Barbara asserts (1) and her assertion is correct. Assuming that in the context, (1) expresses the proposition that *it will be sunny in London on the day after the day of the utterance*, then Barbara must believe that it will be sunny in London on the day following her utterance. But if Barbara were an OF-incompatibilist, it would be irrational for her to believe that it will be sunny in London the day following her utterance; for then she would believe a proposition that she also believed to be not true. But it does not seem to be irrational for Barbara to believe (1), just because she believes that the future is open.²⁹ This point raises a general issue for OF-incompatibilism that goes beyond the rejection of the view that assertion is governed by the sincere belief norm. If we are all intuitive OF-incompatibilists, then it would be irrational for any of us to believe any future contingents that trigger intuitions of openness. However, we not only believe some such future contingents, we also believe that it

²⁸ The belief norm is also unacceptable for a variety of independent reasons. For further discussion, see Williamson 2000.

²⁹ A parallel point can be made with regard to a belief norm that says that you ought to (assert that p) only if you have a high credence in p . However, if we generally have a high credence that future contingents are neither true nor false, the only rational credence in a future contingent proposition would be 0.5. So, it wouldn't be rational to have a credence greater than 0.5 in any future contingent, and we would regard assertions of future contingents as incorrect.

is rational to do so. This provides further evidence that our intuitive understanding of the openness of the future does not commit us to non-bivalence.³⁰

A similar move that the OF-incompatibilist could make would be to adopt an account of assertion according to which to make an assertion is to make a certain kind of commitment.³¹ MacFarlane puts forward a Brandomian account of assertion along these lines in his discussion of the assertion of future contingents.³² He says that in making an assertion:

One is committed to producing a justification, that is, giving adequate reasons for thinking that the sentence is true (relative to its context of utterance and the asserter's current context of assessment), whenever the assertion is challenged.³³

Applied to our case of Alice's uttering (1), MacFarlane's view goes like this. If Alice is challenged in her assertion of (1), and she is shown conclusively that the future is unsettled with respect to the weather in London on the day after the day of her utterance, then she ought to withdraw the assertion. If the challenge is weaker, and she can meet it, then her assertion can stand.

On the face of it, this might seem like an account of the correctness and incorrectness of assertions of future contingents that severs the link between pragmatic and semantic intuitions, and is therefore hospitable to OF-incompatibilism. On this account of assertion, whether or not an assertion is correct depends on whether it is challenged, the nature of the challenge, and whether it can be met under the circumstances; crucially, it does not depend on whether it is true. However, this appearance is misleading: this account of assertion is actually of no use to an OF-incompatibilist who wishes to explain why we accept some assertions of future contingents to be correct. The reason is that even on the Brandomian view, our pragmatic judgements reveal our commitment to a disquotation principle: if we judge an assertion of sentence *S* to be correct in a given context, then we also judge that it is

³⁰ The point is put here in terms of outright belief, though Williams raises a similar objection against non-bivalent accounts of future contingents with respect to partial beliefs (see Williams, forthcoming).

³¹ Brandom 1994.

³² MacFarlane 2003.

³³ MacFarlane 2003: 334.

correct in that context to assert ‘*S* is true’.³⁴ However, if it is correct to assert ‘*S* is true’ in a given context, it cannot also be correct to assert ‘*S* is not true’ in that context.³⁵

So, given that we do frequently judge assertions of future contingents to be correct, a commitment based account predicts that we will similarly regard affirmations of truth to future contingents to be correct, and denials of bivalence to be incorrect. This means that an assertion of OF-incompatibilism will be intuitively regarded as incorrect. Moreover, if the disquotation principle is accepted, then our pragmatic judgments can still be exploited to give evidence of our semantic judgments: assuming a disquotation principle, we judge assertions to be correct only when we judge them to be true.

Furthermore, on MacFarlane’s account of assertion, what it is to make an assertion is to make a commitment to provide adequate reasons for believing that the assertion is true. It follows that an OF-incompatibilist must be insincere when asserting a future contingent proposition. To see why, suppose that Julia is an OF-incompatibilist, and that *p* is a future contingent proposition that is unsettled at *t*. As an OF-incompatibilist, Julia believes that it is not true that *p* at *t*. If Julia were to assert that *p* at *t*, she would thereby be making a commitment to provide adequate reasons for believing that *p* is true. Since she does not believe that *p* is true, she puts herself in a position similar to a lawyer engaged to defend the innocence of a client she believes not to be innocent. This is counterintuitive. First, it is counterintuitive to suppose that we are intuitive OF-incompatibilists such as Julia, who never believe that future contingent propositions are true. Second, it is counterintuitive to suppose that in those cases in which we do assert future contingents, we are either being irrational or insincere. We often make flat out assertions of future contingents, and are prepared to support our assertions with reasons, and do not, in so doing, exhibit either irrationality or insincerity.

4.2 Weakenings

Another line of response from the OF-incompatibilist might be to say that though a norm that entails the truth norm governs assertion, when we hear future contingent sentences uttered,

³⁴ See Brandom 1994. Since Brandom works with sentences, he would express the disquotation principle in terms of sentences rather than propositions. Nothing hangs on this here.

³⁵ MacFarlane accepts a similar disquotation principle, though it is stated in terms of propositions, as we have done elsewhere in this paper. See MacFarlane 2009.

we tend to reinterpret them to mean something weaker.³⁶ For instance, we hear the assertion of (10) as expressing (24):

(24) It is *likely* that I will go running in 10 minutes.

If this is the explanation for why we find assertions of future contingents correct, by parity, we should naturally interpret Alice's assertion of (1) as expressing the proposition that:

(25) It is *likely* that it will be sunny in London tomorrow.

This line of response is promising. If we hear (1) as (25) and (10) as (24), respectively, this could be because we initially regarded those assertions as literally incorrect, which enables the OF-incompatibilist to accept the truth norm. This line of reasoning mimics that involved in the explanation of our intuitive understanding of Becca's utterance of (9) to mean something slightly weaker, such as that the glass is full enough. This is because the assumption that (9) as well as (1) and (10) are obviously literally false generates the reinterpretation.

This suggestion is not compelling, however. We can see this if we consider indirect reports. It is standard to test intuitions about what is said by an assertion against judgments of what would constitute a correct indirect report of what was said. For example, suppose that Cathy phones from San Diego and says:

(26) It is raining.

Suppose that her call is received in England. In this case, it would be natural to report Cathy's assertion indirectly by saying:

³⁶ Thanks to Ant Eagle for suggesting this.

(27) Cathy said that it is raining in San Diego.

The reason why (27) seems like an accurate report of (26) is that (27) seems to capture what is said by (26). Now, it is worth noting that this sort of indirect report test has been criticized, because whereas there is only one literal semantic content of any sentence, there are many different ways in which to report what is said.³⁷ Be that as it may, a weaker inference can be made on the basis of indirect speech reports: it seems obvious that if an indirect speech report seems clearly incorrect, then we can infer that it does not accurately capture what was said by the initial assertion.

It is only this weaker assumption that we need in order to show that the hypothesis under consideration is false. If the hypothesis were true, then (10) and (11) would be correctly reported by (28) and (29):

(28) Addy said that it is *likely* that she will go running in 10 minutes.

(29) Alice said that it is *likely* that it will be sunny in London tomorrow.

However, these do not seem to be accurate reports of what was said. In general, to say that it is likely that p seems to be to say something about the chance or the likelihood that p , whereas to flat-out assert that p seems to say nothing about likelihoods or chances. Hence, to report a flat-out assertion that p as saying that it is likely that p would be misleading. This holds equally in the case of assertions of future contingents. The hypothesis that future contingents are interpreted as expressing propositions concerning the likelihood of future events thus fails the weaker indirect report test, because we do not hear flat-out assertions of future contingents as expressing propositions about likelihood.³⁸

³⁷ Cappelen and LePore 1997.

³⁸ These remarks hold even if we consider other expressions for chances than ‘likely’, which might be thought to be too weak, such as ‘very likely’. The reported speech data suggests that any such strengthening would be inadequate.

Another good reason to reject this view is that it will not give the correct results in lottery cases. On the view under consideration, we interpret the flat-out assertion of (21)—that Paula will not win the lottery—to say that:

(30) It is *likely* that Paula will not win the lottery.

However, assuming the orthodox account of assertion, an assertion of (30), and therefore (21) will come out as correct. Yet, we would generally judge an assertion of (21) to be incorrect, so the view under consideration makes a false prediction in this case.

A further suggestion in the same spirit is that utterances of future contingents are not assertions of a weaker content, but that they are speech acts other than assertion, and governed by weaker norms.³⁹ Perhaps there is a *sui generis* speech act of prediction, which falls short of assertion. The upshot would be that utterances of future contingents would never be assertions. Perhaps predictions are governed by a weaker norm, such as the following:

Prediction Norm:

You ought to (predict that *p*) only if it is highly likely that *p*.

This theory can apparently deal with the cases that we discussed. If utterances of future contingents are governed by the prediction norm rather than the assertion norm, then they will come out as correct even if they are not true, for likelihood does not imply truth.

Another, similar thought might be that utterances of future contingent sentences are a kind of pretend or fictional assertion, analogous to fictional belief.⁴⁰ For example, suppose that Vikram asserts:

³⁹ Thanks to Dorothy Edgington for suggesting this.

⁴⁰ See Williams (forthcoming) for a discussion of fictional belief in relation to non-bivalent accounts of future contingents.

(31) Harry Potter goes to Hogwarts School of Witchcraft and Wizardry.

Intuitively, Vikram's utterance of (31) is correct. However, though we judge his utterance of (31) to be correct, we do not take (31) to be true, because we do not think that Harry Potter exists. One way to explain our intuitions here, without abandoning a truth norm of assertion, is to say that we do not treat (31) as a genuine assertion, but as a quasi-assertion, subject to different norms. That is, suppose that a proposition is true* just in case it is true at a salient fictional possible world. Then, one might think that quasi-assertions are governed by something like the following quasi-assertion norm:

Quasi-Assertion Norm:

You ought to (quasi-assert that p) only if p is true*.

On this view, a quasi-assertion of (31) is correct and true*. In contrast, a quasi-assertion of (32) is false*:

(32) Harry Potter goes to Eton.

This view seems to capture our intuitions about fictional utterances—though both (31) and (32) would be either false or truth-valueless if asserted, because Harry Potter does not exist, a quasi-assertion of (31) could be true*, whereas a quasi-assertion of (32) could be false*, because (31) is true in the world of Harry Potter, whereas (32) is false in that world. Perhaps one might think that the same is true of future contingents. That is, perhaps the fact that we judge utterances of future contingents to be correct is not evidence that we judge them to be true, because we judge them to be quasi-assertions that are correct only if they are true*. On this view, when we assess the correctness of quasi-assertions of future contingents we treat them as a kind of make-believe. Of course, the fictional world in this case could not be made salient by the writings of a particular author, as in the case of Harry Potter. However, one might instead think that the fictional future worlds are those that we regard to be highly

likely, and that we assess the truth* of quasi-assertions of future contingents in terms of truth at the highly likely worlds.

Both the suggestion that utterances of future contingents are predictions and that they are quasi-assertions attempt to avoid the above problems by treating utterances of future contingents as a different kind of speech act, governed by a distinct norm from the norm governing assertion. If utterances of future contingents are not assertions, then perhaps they are not the sorts of speech act whose correctness depends on whether they are true or false *simpliciter*. This allows for judgments of correctness to come apart from judgments of truth. However, no such account can be correct, because future contingent sentences can be embedded with present tense constructions, as in the following:

(33) Ana just arrived and she will fix the pipe.

Is (33) an assertion or some other type of speech act? If it is an assertion, then the invention of an alternative speech act type for future contingents does not help avoid the foregoing objections. For, there are clearly contexts in which we would judge (33) to be a correct assertion, yet regard the future to be open with respect to whether Ana fixes the pipe (for instance, if she forgot her tools, or gets called away for more urgent business, or she chats for too long and runs out of time).

On the other hand, if we decide that (33) is not an assertion, but a quasi-assertion, or a prediction, then other difficulties arise. If utterances of future contingents were not assertions but some other kind of speech act, arguments containing both future contingents and present tense statements, or containing embedded constructions, would not come out as straightforwardly valid. For instance, the following argument would not be straightforwardly valid if utterances of future contingents are not assertions, and therefore, neither true nor false:

(34) If Ana will fix the pipe, then she is here now.

(35) Ana will fix the pipe.

(36) So, Ana is here now.

The above argument is intuitively valid, but it would not be valid if (35) were not an assertion. The problem here is similar to the well-known Frege-Geach problem for meta-ethical expressivists.⁴¹ According to the expressivist, an utterance of a normative sentence, such as ‘murder is wrong’ is not an assertion, but an expression of a non-cognitive attitude, such as an emotion, an attitude of acceptance, or endorsement. The Frege-Geach problem is that ‘murder is wrong’ can be embedded, as in ‘if murder is wrong, then getting little brother to murder is wrong,’ and these sentences can in turn function as premises in intuitively valid arguments.⁴² Various solutions have been attempted to the Frege-Geach problem, typically in terms of consistency within an assumed system of norms or a moral framework.⁴³ Similarly, one might suggest that arguments containing future contingents are deductively valid if the truth* of the premises guarantees the truth* of the conclusion. However, this has the unhappy consequence that the above argument does not permit us to conclude that (36), which is a present tense statement, is true *simpliciter*, only that it is true*. Since future contingents can straightforwardly be embedded, it is implausible to assume that when we utter future tensed contingent sentences we are not making assertions, but performing some other type of speech act that is not subject to a truth norm, and is thus not properly assessed as either true or false.

There does not seem to be any satisfactory move which the OF-incompatibilist can make to explain our pre-theoretic judgments concerning the correctness and incorrectness of assertions of future contingents: neither weakening the relevant norms of assertion, nor weakening the contents of those assertions, nor appealing to speech acts different from assertion nor appealing to multiple concepts of truth helps the OF-incompatibilist to explain the pragmatic facts. OF-incompatibilism cannot be rescued.

5 Concluding Remarks

The pragmatic data suggests that we sometimes judge assertions of future contingents to be correct, even though we judge the future to be open in relevant respects. Given the close connection between our pragmatic judgments and intuitive semantic judgments, the

⁴¹ See Geach 1957-8.

⁴² E.g. If murder is wrong, then getting little brother to murder is wrong; murder is wrong; so, getting little brother to murder is wrong.

⁴³ See Gibbard 2003 and Blackburn 1993.

pragmatic data provides us with strong evidence that we do not intuitively judge future contingents to be non-bivalent. Hence, the intuitive thought that the future is open but the past is closed is compatible with the bivalence of future contingents. This places constraints on accounts of the openness of the future which favours OF-compatibilism over OF-incompatibilism.

OF-incompatibilists are at a dialectical disadvantage relative to OF-compatibilists. To take a concrete example, with regard to capturing our semantic intuitions, MacFarlane's non-bivalent account of openness is at a dialectical disadvantage relative to Lewis' bivalent account. MacFarlane's account of openness implies an error theory: it implies that our ordinary pragmatic judgments about the correctness of assertions of future contingents are systematically mistaken. Of-incompatibilists like MacFarlane typically defend their view on the grounds that it captures our pre-theoretic semantic intuitions. This line of defense of OF-incompatibilism is untenable.

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