

## reflections on epistemic modals

On the standard view of epistemic modals such as ‘might’ and ‘must,’ sentences in which these terms figure express different propositions in different contexts of utterance. On one such view, the sentence ‘water might be an element,’ when uttered in context  $C$ , expresses the proposition that it is compatible with everything known *in*  $C$  that water is an element. This standard view, however, has recently faced a number of objections. Appealing to a variety of data, several authors have argued for the following thesis:

***Invariantism about Epistemic Modals (IEM)***: sentences that contain epistemic modals, and that are otherwise free of context-sensitive terms, express the same proposition in every context of utterance.<sup>1</sup>

On this view, a sentence like ‘water might be an element’ expresses the same proposition whenever it is uttered assertively. In what follows, we will examine a case which appears to show that IEM is incompatible with the principle of Reflection. We will then consider two ways in which the defender of IEM might respond to this problem, and we will argue that neither of them is plausible. We will then argue that the problem we have indicated is very general, and arises not only for Invariantism about Epistemic Modals, but also for related accounts that have recently been proposed in several other domains.

### 1 the argument

The core idea of our argument is what we think should be an obvious point: when someone lacks information which would determine whether  $P$ , it is rational to think that it might be that  $P$  and it might be that  $\sim P$  – and moreover that this is true, even for an agent who knows that she will soon come to gain information which will determine whether  $P$  – after which she will either no longer think that it might be that  $P$  or no longer think that it might be that  $\sim P$ , and hence no longer think their conjunction. This is what violates the principle of Reflection in a novel way.

We now spell out this thought in more detail, by looking at the following scenario, and taking a slight detour through sentences, in order to try to be careful not to beg any questions:

*Horse Race.* The time is 11:59am. Emily and Hugo are spending a day at the races, and a horse race has just finished. They have bet their money on Hi-Hat, but they were unable to see whether Hi-Hat crossed the finish line first. Hugo assertively utters the following sentence, which we may label  $S$ : ‘Hi-Hat might be the winner, and he might not be the winner.’ Hugo knows, however, that by noon, the judges will have announced the winner,

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<sup>1</sup> Compare, for example, Egan *et al* [2005] and MacFarlane [forthcoming].

and so he will know who the winner is. He also knows that at noon, Emily, who is hard of hearing, and who will have not heard the judges' announcement, will repeat sentence S. And he knows that he will contradict this assertion, by asserting  $\sim S$ : 'it is not the case that Hi-Hat might be the winner, and that he might not be the winner.' At 11:59, Hugo is fully rational, and he is fully confident that he will remain fully rational at noon. Further, at 11:59, when Hugo utters S, he understands, and is fully confident in, what he is saying. He also understands, at 11:59, what he will be saying at noon when he utters the negation of S, and he is fully confident that, in uttering the negation of S at noon, he will understand, and be fully confident in, what he is saying.

Assuming that truth-functional compounds of context-invariant sentences are themselves context-invariant, it follows from IEM that there is a proposition, p, such that

(1) Hugo asserts p at 11:59, and Emily asserts p at noon.

And since, at 11:59, Hugo understands the meaning of what he says, and he is fully confident in what he is saying,

(2) At 11:59, Hugo is fully confident in p

Furthermore, since at noon, Hugo will contradict Emily's utterance of S, which expresses p, it follows that Hugo's utterance will express  $\sim p$ , the negation of p. And since at 11:59, Hugo understands the meaning of the utterance he will make at noon,

(3) At 11:59, Hugo is fully confident that at noon, in asserting  $\sim S$ , he will assert  $\sim p$ .

By stipulation,

(4) At 11:59, Hugo is fully confident that at noon, in asserting  $\sim S$ , he will understand, and be fully confident in, what he is asserting.

Hence, from (3) and (4),

(5) At 11:59, Hugo is fully confident that, at noon, he will be fully confident in  $\sim p$ .

And since, at 11:59, Hugo is fully confident that, at noon, he will be fully rational,

(6) At 11:59, Hugo is fully confident that, at noon, he will have no confidence in p.

And, by stipulation,

(7) At 11:59, Hugo is fully rational.

The conjunction of (2), (6), and (7), however, is incompatible with the following principle:<sup>2</sup>

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<sup>2</sup> See van Fraassen [1984].

**Reflection.** For any proposition,  $p$ , any future time,  $t$ , and any degree of belief,  $x$ , that one thinks one may have in  $p$  at  $t$ , one's degree of belief in  $p$ , conditional on the supposition that at  $t$  one's degree of belief in  $p$  will be  $x$ , is rationally required to be  $x$ .

It would seem, therefore, that anyone who accepts IEM must reject Reflection. Admittedly, there are certain epistemic situations in which it is widely held that Reflection does not apply—specifically, epistemic situations in which one anticipates irrationality or loss of information, or in which there is actual or expected uncertainty concerning self-location. But none of these phenomena is present in Horse Race, and so even if we restrict Reflection so as to exclude all such problematic epistemic situations, it will still apply in this example. Hence it will still imply that (2), (6), and (7) cannot all be true in Horse Race, contrary to IEM. Thus, IEM is incompatible even with a highly restricted formulation of Reflection.

## 2 resisting the argument: content relativism?

We will now consider two responses to this argument, one which seeks to avoid its conclusion, and one which tries to motivate embracing it. Both responses involve a bit of technical machinery – each involves accepting a kind of relativism – but they are the two responses which we take most seriously, and each leads to an important lesson.

The first response open to the defender of IEM is to resist the move from (4) to (5) by adopting Content Relativism about Epistemic Modals. This is the view that sentences involving epistemic modals express different propositions relative to different *contexts of assessment* (that is, relative to different contexts from which these sentences may be interpreted and evaluated).<sup>3</sup> This kind of relativism is compatible with IEM. For IEM entails only that the proposition expressed by a sentence such as  $S$  cannot vary with its context of *utterance*; it does not entail that this proposition does not vary with its context of *assessment*. Thus, the proponent of IEM can adopt Content Relativism, so long as she holds that, *relative to any given context of assessment*, sentences that contain epistemic modals, and that are otherwise free of context-sensitive expressions, express the same proposition in every context of utterance, as in the following picture:

		Context of assessment	
		S	
Context of utterance	11:59	p	q
	noon	p	q

On a Content-Relativist but contextual-invariantist view like this one, ‘Hi-Hat might be the winner’ expresses the same proposition at 11:59 as at noon’ expresses a truth at both 11:59 and at noon, but ‘Hi-Hat might be the winner’ expresses  $p$ ’ expresses a truth only at 11:59 and ‘Hi-Hat might be the winner’ expresses  $q$ ’ expresses a truth only at noon.

The idea of moving to a Content-Relativist version of IEM is that it makes it possible to resist the move in our argument from (3) and (4) to (5), by motivating an interpretation of (4) on

<sup>3</sup> Weatherson [forthcoming] calls this view ‘Indexical Relativism’; we’ll stick to our more descriptive name for the view.

which (5) does not follow from (3) and (4). The idea is that given Content Relativism, at noon ' $\sim S$  expresses  $\sim p$ ' expresses a falsehood. But in order for the step from premises (3) and (4) to (5) to be valid, (4) needs to be understood as stipulating that at 11:59, Hugo is fully confident that at noon he will understand that  $\sim S$  expresses  $\sim p$ . But at noon, ' $\sim S$  expresses  $\sim p$ ' will express a falsehood, so it would be a strange thing for Hugo to think, if he understands what his words mean. So if Hugo is rational, then he should take account of that, at 11:59, and expect himself to, at noon, be fully confident in  $\sim q$ , rather than in  $\sim p$ . In this way, the proponent of IEM who adopts Content Relativism can block the inference from (3) and (4) to (5). Hence, she can resist the conclusion that Hugo violates Reflection.

The problem with this move, however, is that it undermines one of the primary motivations for IEM. For one of the principal arguments for IEM relies on the following claim:

***Disagreement:*** For any sentence,  $X$ , that contains epistemic modals but is otherwise free of context-sensitive expressions, if one agent sincerely utters  $X$  while another agent sincerely utters the negation of  $X$ , then the two agents disagree.

The best explanation for this disagreement, it has been argued, is that the two agents' utterances express contradictory propositions.<sup>4</sup> However, if the defender of IEM responds to our argument in the manner just considered, then she cannot plausibly endorse Disagreement. For according to the above response, what is required in order for Hugo to sincerely utter  $S$  at 11:59 is that he believe one proposition,  $p$ , and what is required for him to sincerely utter the negation of  $S$  at noon is that he believe the negation of some other proposition,  $q$ , where the negation of  $q$  is perfectly compatible with  $p$ .<sup>5</sup> And so Hugo could rationally and sincerely utter  $S$  at 11:59 and  $\sim S$  at noon without there being any change in his beliefs or other mental states between the two times. Hence, according to the response we are considering, sincere utterances of contradictory sentences containing epistemic modals can be made by rational agents with the very same mental states.

But if two agents have the exact same mental states, then it would seem that these two agents cannot genuinely disagree. And so it seems that anyone who adopts the response we are considering must conclude that sincere utterances of contradictory sentences containing epistemic modals, such as  $S$  and  $\sim S$ , can be made by agents who do not genuinely disagree.

Indeed, this conclusion follows directly from a criterion for disagreement defended by Allan Gibbard. According to Gibbard, in cases of genuine disagreement, those who disagree must have mental states such that it would be irrational for a single agent to have these mental states at a single time.<sup>6</sup> Hence, if rational agents with the very same mental states can sincerely utter contradictory sentences that involve epistemic modals, and that are otherwise free of context-sensitive expressions, then such contradictory utterances needn't involve genuine disagreement, and so Disagreement is false. Hence, if the defender of IEM adopts Content Relativism, she must reject Disagreement, thereby abandoning one of the principal attractions of her position.

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<sup>4</sup> Compare the discussions of disagreement in Egan, *et al* [2005] and in MacFarlane [2007].

<sup>5</sup> Note that if the negation of  $q$  were incompatible with  $p$ , then in believing that he will be fully confident in the negation of  $q$  at noon, Hugo would have to believe that he will have no confidence in  $p$  at noon, since he expects to be fully rational at noon. Thus, the violation of Reflection can be avoided only if the negation of  $q$  is compatible with  $p$ .

<sup>6</sup> See Gibbard [2003], especially pp 65-75.

### 3 embracing the conclusion: truth relativism

An alternative response available to the defender of IEM is to try to explain why denying Reflection is not problematic, by endorsing another kind of relativism in its place, namely *Truth Relativism* about Epistemic Modals. Truth Relativism is the view advocated by John MacFarlane (though as we'll see shortly, we do not anticipate that he would respond to our argument in this way). According to Truth Relativism, the truth value of a sentence such as S can vary with its context of assessment, not because it expresses different propositions relative to different contexts of assessment, but rather because it expresses a single proposition whose *truth value* varies with its context of assessment. Or, in MacFarlane's terminology, it expresses an *assessment relative* proposition.<sup>7</sup>

The Truth Relativist response does not enable the defender of IEM to deny that there is any violation of Reflection in Horse Race. For insofar as the defender of IEM denies *Content Relativism*, she must grant that the proposition in which Hugo is fully confident when he utters S at 11:59 is the very same as the proposition in whose negation he expects she will be fully confident when he utters the negation of S at noon. But the Truth Relativist response may enable the defender of IEM to deny that the violation of Reflection in Horse Race is problematic. For it seems that the Truth Relativist may be able to plausibly argue that one should not expect a rational agent to satisfy Reflection in relation to assessment-sensitive propositions, since the standard explanation for why we should satisfy Reflection does not apply to such propositions. Such reasoning would go like this:

The reason we should normally satisfy Reflection in relation to assessment-*insensitive* propositions is that normally, our having a given credence in a proposition at some future time indicates that, by this future time, we will have acquired evidence warranting this level of credence. And, where p is an assessment insensitive proposition, the fact that we will acquire evidence in the future that warrants a given credence in p *itself* warrants this degree of credence in p now. But the same would not hold if p is assessment-sensitive. For in this case, the fact that we will have evidence warranting a credence of x in p at a given future time would seem to indicate, at most, that we should currently have a credence of x in the proposition that p is true *relative to* the context of assessment we will occupy at this future time. It will not indicate that we should currently have a credence of x in the proposition that p is true relative the context of assessment we now occupy, since the truth value of p may differ between these contexts. And presumably, our credence in p at t should be equal to our credence in the proposition that p is true relative to the context of assessment we occupy at t. Consequently, if p is assessment-sensitive, then the fact that we will have evidence warranting a credence of x in p at a given future time will not indicate that we should have a credence of x in p now. Hence, if p is assessment-sensitive, then we needn't satisfy Reflection in relation to p.

A theorist who endorses this reasoning would accept our conclusion, but suggest that it is not surprising or problematic. Unfortunately, however, we cannot recommend this line of reasoning to the Truth Relativist. For we believe that it undermines the philosophical underpinnings of Truth Relativism. The core idea of Truth Relativism, after all, is that propositions are not absolutely

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<sup>7</sup> MacFarlane [2005], p. 327. Contexts of assessment are features of MacFarlane's semantics; other relativist theories work by adding evidential sets or some other kind of parameter to the circumstances of evaluation for propositions. For MacFarlane's explanation of why he thinks this is inadequate, see his [2005] and [2007]. The difference won't be important for the points we wish to make, here.

true, but true only relative to contexts of assessment.<sup>8</sup> But theoretically, propositions play the role not only of being the bearers of truth and falsity, but also of being the objects of the attitudes. They are the things which Emily thinks, and Hugo denies, and is true, when Emily thinks and Hugo denies and it is true that Hi-Hat might be the winner. So Truth Relativism must make sense of how merely relatively-true propositions could be the objects of belief, desire, and assertion, to say nothing of the other propositional attitudes.

The fundamental philosophical problem confronting Truth Relativism is that it is not obvious how merely relatively true propositions could be the objects of belief or assertion.<sup>9</sup> How can I believe something that is true relative to some ways of filling in an open parameter, but false relative to other ways of filling it in? Surely I should only believe that it is true *relative to* the former ways of filling in its open parameter. Similarly, how can I assert something that is true relative only to some ways of filling in an open parameter, but false relative to other ways of filling it in? Am I committed to its truth relative to every way of filling in the open parameter? Or just to its truth relative to the way provided by my own context of assessment? Either way, it would seem that what I am really asserting is not the unrelativized proposition, but that it is true relative to some or all contexts.

The foregoing reasoning is exactly the same reasoning as the Truth-Relativist explanation of the acceptability of denying Reflection endorsed. According to that reasoning, Hugo's credences need to be restricted to the truth of *p relative to his own context of assessment* and the truth of *p relative to the future context of assessment*. This is precisely what motivates the denial of reflection, in that argument. But to endorse this reasoning is precisely to admit that relatively-true propositions are *not*, in fact, the proper objects of belief or of credence, and that the *real* objects of belief or credence are propositions-relative-to-contexts-of-assessment. But if propositions aren't really the objects of belief or credence or of the other propositional attitudes, then we think that Truth Relativists have failed to make good on the idea that propositions are only relatively true.

This is precisely why MacFarlane [2005] rejects the principles relied on in the kind of reasoning involved in our proposed Truth-Relativist attempt to explain why denying Reflection is not problematic. MacFarlane concedes that anyone proposing a Truth-Relativist account of epistemic modals, or of any other kind of expression, owes an explanation of what it means to say that a proposition is true relative to one context of assessment but not relative to another. MacFarlane holds that the concept of assessment-relative truth, like any other concept of truth, is indefinable, and so it can be explicated only by indicating the role that it plays. Hence, he proposes to explicate this concept 'by giving assessment-relative truth a role to play in a normative account of assertion.' In effect, what MacFarlane then goes on to do, is to explain how merely relatively-true propositions could be the objects of assertion – just as we have just argued Truth-Relativists need to do.

In making an assertion, MacFarlane argues, we commit ourselves to the truth of what we assert, and this involves a commitment to providing justification. On MacFarlane's view, when truth is understood as assessment-relative, this commitment to providing justification can be expressed by the following principle:

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<sup>8</sup> Or alternatively, only relative to some other further parameter which supplies an evidential background.

<sup>9</sup> Very similar points go for other propositional attitudes, but we will focus on belief and assertion here.

**Justification Commitment.** In asserting that *p* at *C1*, one commits oneself to justifying the assertion when the assertion is appropriately challenged. To justify the assertion in a context *C2* is to provide grounds for the truth of *p* relative to context of use *C1* and context of assessment *C2*.<sup>10</sup>

What Horse Race shows, however, is precisely that Justification Commitment is not a tenable principle, either for MacFarlane or for any other defender of IEM who does not accept Content Relativism. For, as we have seen, any such defender of IEM must concede that in Horse Race, there is a proposition, *p*, such that Hugo asserts *p* at 11:59 while being fully confident that at noon he will rationally be fully confident that *p* is false. But in this case, in asserting *p*, it is hardly plausible that he is committed to justifying *p* at noon. Nor is it plausible that he is committed to providing grounds, at noon, for the truth of *p* relative to the context of assessment he will occupy at noon.

If it were part of the practice of asserting sentences involving epistemic modals that one was committing oneself to such a thing, then we would all be committing ourselves to having to defend something that we *know in advance* will be indefensible, by asserting sentences involving epistemic modals in situations like Hugo's. But a *large proportion* of our uses of epistemic modals are in situations like Hugo's – situations in which we know or have good reason to suspect that our ignorance will later be eliminated. So Justification Commitment, on top of Truth Relativism about epistemic modals, would make our willingness to assert sentences involving epistemic modals in all of these sorts of situations quite mysterious.

In this and the last section, we have surveyed the kinds of responses to our argument that are permitted by two kinds of relativist view. Content Relativism seems to provide a motivation for rejecting one of the steps of our argument, but we showed that in order to accept this move, Content Relativists must give up on Disagreement, which plays a central role in motivating IEM in the first place. Truth Relativism seems to provide an explanation of why the conclusion of our argument is not problematic, but we showed that in order to accept this move, Truth Relativists must lose out on what we take to be the most promising attempt to provide philosophical underpinnings for Truth Relativism in the first place, MacFarlane's articulation of the principle we have called Justification Commitment. Indeed, as we also observed, our argument could have been framed directly as a problem for Justification Commitment.

#### **4 other applications**

While our focus, in this paper, has been Invariantism about Epistemic Modals, very similar problems arise for other invariantist views that have recently been proposed. In particular, they arise for invariantist accounts of predicates of personal taste, and of the normative 'ought.' In the case of both these kinds of expression, it has been argued that contextualist accounts are unworkable, and that we should instead adopt a view according to which the meanings of these expressions do not vary with the context of utterance. The problem for the invariantist views, however, is that these expressions can figure in sentences that one can sincerely utter while rationally anticipating that at some future time one will sincerely utter their negation. Hence, these invariantist views imply that one can rationally violate Reflection.

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<sup>10</sup> See MacFarlane [2005], p. 337. MacFarlane calls this principle 'J\*.'

To see how this problem arises for invariantist views of predicates of personal taste, consider the following case.

*Seasonal Wine.* Emily observes that every winter she loves red wine, while every summer she dislikes red wine.

In this case, it would seem that in the winter, Emily could sincerely utter 'Red wine is tasty' while believing that in the summer she will sincerely utter 'Red Wine is not tasty.' On the invariantist view, the proposition she sincerely asserts in the winter is the same as the proposition she believes she will sincerely deny in the summer. Thus, given some further stipulations about this case analogous to the ones we made in Horse Race, it will follow from the invariantist view of predicates of personal taste that there is some proposition, *p*, such that in the winter, Emily is fully confident in *p* while rationally believing that in the summer she will have no confidence in *p*. Hence, she will rationally violate reflection.

To illustrate the problem for invariantist views of the normative 'ought', consider this case.

*Three Envelopes.* At 11:59, Emily knows that at 12:01, Hugo will have to choose between three envelopes. She knows that the first envelope contains \$900, and that one of the other two envelopes contains \$1,000, while the other contains \$0. And also knows that which of these two envelopes contains the \$1,000 was determined by a fair coin toss, and that it will be revealed to her, but not to Hugo, at noon. Emily is isolated from Hugo, and so he cannot hear anything she says

Relative to what Emily knows at 11:59, the best option available to Hugo is to take the first envelope. And so it seems that at 11:59, Emily could sincerely utter 'Hugo ought to choose the first envelope.' But at noon, Emily will either know that the \$1000 is in the second envelope or she will know that the \$1000 is in the third envelope. Either way, she will be in a position to sincerely utter 'Hugo ought not to choose the first envelope.' And at 11:59, Emily might well anticipate that she will make this utterance at noon. Now on many views of the normative 'ought', this would not entail any violation of reflection, since on many such views, the proposition Emily asserts at 11:59 will differ from the proposition she anticipates denying at noon. But on the invariantist view of the normative 'ought', these are one and the same proposition. Hence, given some further stipulations about the case, it will follow from the invariantist view that there will be a proposition in which Emily is fully confident at 11:59, while rationally believing that at noon she will have no confidence in this proposition. And so she will rationally violate Reflection.

Thus, the invariantist views of predicates of personal taste and of the normative 'ought' run into the same problems with Reflection as the invariantist view of epistemic modals. The same dialectic goes as before, for the two responses we have already considered.

This means, as a corollary, that of his proposed applications of Truth Relativism to future contingents, epistemic modals, predicates of personal taste, and the deontic 'ought', MacFarlane's Justification Commitment principle seems to work only for the case of Future Contingents (for which it appears tailor-made).<sup>11</sup> Since on his own terms (and ours) Justification Commitment is

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<sup>11</sup> See MacFarlane [2003] and [2008].

the most promising way proposed to date of 'making sense of relative truth', this is a deeper problem for MacFarlane, and perhaps for the intelligibility of relative truth.

In closing, it seems that we must either reject these invariantist views, or else we must reject, or find some other way of motivating novel constraints upon, the principle of Reflection. We leave the reader to draw her own morals.

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