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Epistemic Modal Disagreement
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ABSTRACT: At the center of the debate between contextualist versus relativist
semantics for epistemic modal claims is an empirical question about when
competent subjects judge the presence of epistemic modal disagreement.
John MacFarlane's relativist claims that we judge there to be epistemic modal
disagreement across the widest range of cases. We wish to dispute the
robustness of his data with the results of two studies. Our primary
conclusion is that the actual disagreement data is not consistent with
relativist predictions, and so, that the primary motivation for relativism
disappears. Our study differs from a related study by Knobe and Yalcin
(2014) in that we focus directly on the question of genuine disagreement, as
opposed to a question about truth or the appropriateness of retraction.
Some of our findings agree with theirs about relativism. We uncover new
lessons along the way, including that there are widespread situation effects
of epistemic modal discourse; idiosyncratic features of the vignettes
significantly influencing judgments about epistemic modal disagreement.
We reflect with mixed feelings on the prospects for contextualism to
accommodate our findings.

The contextualist and relativist agree that the truth value of an epistemic possibility claim of the form

“It might/may be that p”

is sensitive to the epistemic states of members of the relevant group. For the contextualist the relevant group is a function of the speaker's context of utterance, and for the relativist it is a function of the assessor's point of evaluation of the speaker's utterance. The following are familiar tokens of the contrary frameworks:

(Contextualism)
“It might/may be the case that p”, as uttered by x in the epistemic sense, is true at the relevant point of assessment iff p is compatible with the set of propositions known by x (and perhaps her conversational partners) at the world and time of utterance.

(Relativism)
“It might/may be the case that p”, as uttered by x in the epistemic sense and assessed by y, is true at the relevant point of assessment iff p is compatible with the set of propositions known by y at the world and time of y's assessment of x's utterance.

The contextualist framework (not necessarily the above instance) is the dialectical default, not only because (unlike relativism) it invokes machinery that is already familiar in formal semantics (e.g., in the received view of indexicals, demonstratives and quantifiers), but also because epistemic modals (unlike, say, knowledge attributions) pass with flying colors standard linguistic tests for context sensitivity.[1] The two frameworks agree that epistemic modal truth values swing with changes in epistemic states, but disagree on whether those states need to be a function of the speaker's context of use. Movement from the default contextualist position to a more exotic relativist framework then requires forceful motivation. In that spirit the relativist emphasizes empirical data that allegedly only she can accommodate. The most fundamental is the so-called disagreement data (of which the "eavesdropping data" is a special case).

Eavesdropping cases put the two speakers at a distance. For instance, Jane is at the bus stop wondering where her bus is, and says to her friend, "We may have missed the bus." George, who is also at the bus stop, is eavesdropping and mumbles, "She's wrong. *They can't have missed the bus*. I've been here for an hour and know it has not come." Our relativist, the brand that we will be criticizing, claims that the natural reading is that our eavesdropper, George, is denying Jane's epistemic modal claim---that literally, George and Jane cannot simultaneously speak the truth. They genuinely disagree.[2]

The view is that the relativist, but not the contextualist, can straightforwardly accommodate the eavesdropping data. After all, p is compatible with the set of propositions known by the speaker (and her group), and the eavesdropper does not dispute that. By contrast, p is not compatible with what the assessor knows, when the assessor is the eavesdropper. The relativist concludes that her own framework, even if exotic, is superior to the dialectical default at explaining such basic epistemic modal talk.

This paper provides new data to the dispute. We do not rehearse the full range of criticisms that have been waged for and against the two positions. Nor do we discuss all the positions that fall under these two general categories. Instead we wish to evaluate the robustness of the disagreement data in particular, since it has been highlighted as a primary motivation for relativism. We evaluate the empirical question of when subjects take speakers to disagree about epistemic modal matters. When is the disagreement-reading available to competent native ears? Note that, because disagreement questions require complex assessments of situations, these data undoubtedly reflect several factors beyond semantic competence. This is, indeed, likely to be the case in any experimental investigation of complex cognitive

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[1] We have in mind here the binding test, and the licensing test in particular. Cf Jonathan Schaffer (2009) on epistemic modals and Jason Stanley (2005b, Chapter 3) on knowledge-attributions.

[2] The familiar line is developed in Andy Egan, John Hawthorne, & Brian Weatherson (2005), Egan (2007), and in John MacFarlane (2011).

phenomena. We contend that we can still learn something about semantic competence in the face of this variation in other factors, however. In particular, the second experiment reported here attempts to factor out a number of non-semantic aspects of the broader context and still finds some robust differences in disagreement intuitions, even in the face of substantial 'situational' variation that is unrelated to the interpretation of epistemic modals *per se*.

There are other related characterizations of the data that are said to be in need of explanation. For instance, there is y's (and our) inclination to judge x's epistemic modal claim as false, and there is x's alleged inclination to retract her initial modal claim in response to y's overt denial.[3] However, the disagreement data is more fundamental. If we are inclined to judge x and y as genuinely disagreeing over an epistemic modal matter (in the sense that x and y cannot both speak the truth), then that would explain why we (and y) are inclined to judge x as having said something false (in light of y's better epistemic position). And it would explain our inclination to judge it appropriate for x to retract her initial claim (once appraised of y's better epistemic position). The converse is not the case. For instance, there is a natural socio-pragmatic explanation of y's inclination to (mistakenly) judge x as having said something false---e.g., in terms of y's confusion as to whether x is using the modal epistemically or counterfactually.[4] Such "slippage" in interpretation on y's part is not readily converted into an explanation of why *we* take x and y to be engaged in a genuine dispute (if/when we do). After all, on the slippage account, x and y are not in dispute; x expressed an epistemic modality, but y disputed a counterfactual modality.

Similarly, not all explanations of appropriateness of retraction convert into an understanding of judgments about disagreement. Knobe and Yalcin (2014) for instance suggest that speakers sometimes retract epistemic modal claims, not because they think their claim is false, but rather because they no longer wish to make its contribution to the common ground. Such cases tell us nothing about why *we* take x and y to be engaged in a genuine dispute (if/when we do). For such an explanation of the retraction does not even suppose that x has said something false, but rather that x withdraws a certain contribution from the background.

We focus on the disagreement question also because retraction data is obviously not available in the more decisive eavesdropping cases. In the eavesdropping cases x cannot retract in light of y's more informed perspective because she is unaware of y's perspective. States of disagreement between two parties, by contrast, can be evaluated even if the parties are unaware of each other.

Section 1 rehearses MacFarlane's *problem of lost disagreement*. If MacFarlane is correct, then for any (interesting) brand of contextualism C, there is a modal

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[3] These are among the data studied in Knobe and Yalcin (2014).

[4] Hawthorne (2009) gives a version of this sort of explanation.

epistemic disagreement that C cannot explain.[5]   Section 2 is an examination of MacFarlane's target notion of disagreement. If the notion is sufficiently clear and characterizes a state that is tracked by intuitive judgments, then it can inform the question of how to test empirically for the presence of this semantic phenomenon. For readers already familiar with the "arguments from lost disagreement" and the target notion of disagreement (i.e. the preclusion of join accuracy), we encourage skipping ahead to Section 3, where we discuss the data collected from our two studies. In both of our studies subjects take there to be much less epistemic modal disagreement than relativism predicts. Other lessons are drawn. For instance, in Study 2 we find that the conversational relation (e.g., being in same conversation versus being in a remote eavesdropping scenario) has less effect on peoples' judgments about disagreement than does the non-modal subject matter and setting (e.g., FBI surveillance scenario about a person's location versus a classroom setting about a score on a math test). Study 1 can be understood to support contextualism up to a point, however Study 2 leaves us with more questions than answers about the correct theory of our epistemic modal talk.

1. The Problem of Lost Disagreement

The point of this section is to demonstrate the problem of lost disagreement, which is the centerpiece in MacFarlane's argument against contextualism in favor of relativism.   There are multiple drafts of the argument, one for each version of contextualism that MacFarlane considers. The essential structure quickly becomes clear. Each argument begins with a person x making an epistemic modal claim, "it *might* be that p", for some contingent proposition p, and another relevantly more informed person y uttering a syntactic denial of x's utterance---for instance, "It can't be that p". We are asked to consult our pre-theoretic intuitions and notice and x and y are in a state of genuine disagreement---i.e., that they dispute some epistemic modal matter, in the sense that they cannot both speak the truth. The final stage of the argument demonstrates that the version of contextualism in play does not predict a disagreement in that scenario, for it does not issue enough shared content between x and y to ground a genuine dispute. Rather, it interprets x and y in such a way that they may both speak the truth.

We begin with solipsistic contextualism. It is solipsistic in that it says that all and only the speaker's knowledge is relevant for the proper evaluation of a might-claim. *Solipsistic Contextualism*, or (SC), says

> (SC)
> "It might be that p" is true as uttered by x (at time t)   iff p is compatible with K,

[5] More specifically, he concludes that, for any brand of contextualism C, either (i) it is unclear how speakers can take themselves to be suitably placed to make a might-claim or (ii) there is a modal epistemic disagreement that C cannot explain. So we read "interesting" as "any account for which it is clear how speakers can take themselves to be suitably placed to assert a might-claim".

where K is the set of propositions known by x (at time t).[6]

Minimally, contextualists take the *truth-value* of the might-claim to turn on the knowledge in question (in this case, the speaker's knowledge). Typically contextualists will make the stronger claim that the knowledge in question plays a content-determining role as well. Our thoughts about contextualism will not decide between these differences, since for the case of non-embedded epistemic modals (and their negations) the corresponding contextualist positions predict the same truth values, and so, the same verdicts about genuine dispute. However, by "contextualism" we will refer to the stronger position throughout.

The argument from disagreement against (SC) is a one-two punch that goes like this:

Punch 1: A dialog is presented in which an apparent epistemic modal dispute is exhibited between speakers, in this case between Sally and George:

> (Boston)
> Sally and George are discussing Joe's whereabouts. Sally says, "Joe might be in Boston." George replies, "Joe can't be in Boston. I just had breakfast with him here in Los Angeles 30 minutes ago."[7]

That is, we are asked to consult our intuitions, and notice that we pick up on a genuine (epistemic modal) disagreement between Sally and George. The sense of "disagreement" is meant here to be a non-technical notion---in the sense that it is something that ordinary non-philosophers of language are capable of tracking.

Punch 2: It is claimed that (SC) cannot explain the disagreement. After all, according to (SC), Sally is claiming that, for all Sally knows, Joe might be in Boston. And George is denying that, for all George knows, Joe might be in Boston. On these readings, there is no dispute. Hence, (SC) does not accommodate a pretty ordinary case of epistemic modal disagreement.

Arguably, on the (SC) reading, disagreement is not even possible---or at least it is not possible to have a modal epistemic disagreement via an affirmation and a denial of a free-standing epistemic modal claim. The state of asserting, while someone else is denying, an unmodified, unembedded epistemic modal-claim cannot constitute a disagreement, because by (SC) such utterances are always about the states of their users. Multiple users implies multiple subject matters.

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[6] This is not the most careful formulation of the position. It obviously cannot handle epistemic possibilities that are not logically possible. To resolve this, one usually reads "x does not know not-p" for "p is compatible with what s knows". If the reader wishes, she may substitute.

[7] The example is borrowed and modified from MacFarlane (2011: 147-149).

The obvious response to the above argument, which MacFarlane foreshadows, is that contextualism is not solipsistic. It is not only about the *speaker's* knowledge. Historically, we do not find many solipsists. Compare, G.E. Moore (1962: 279), Hacking (1967: 153), Teller (1972: 312), Kratzer (1977) and DeRose (1991: 593-594). We see that these earliest expressions of contextualism about epistemic modals are indeed non-solipsistic. Among these, Hacking is least obviously non-solipsistic. However see DeRose (1991: 587-588) for a non-solipsistic reading of Hacking. MacFarlane (2011: 150, n.4) points out, by contrast, that Jason Stanley (2005a: 128) appears to be a solipsist. Notice also that Robert Stalnaker (1984: 143) is solipsistic.[8]

The foregoing argument is useful to elucidate the structure of MacFarlane's argument against any brand of contextualism, even flexible non-solipsistic contextualisms. Perhaps your favorite brand of contextualism says that a might-claim that p is true just in case p is compatible with what is known collectively by the speaker and her conversational partners. Call this *Conversational Group Contextualism* (CGC):

> (CGC)
> "It might be that p" is true as uttered by x (at time t)   iff   p is compatible with K,
> where K is the set of propositions collectively known by x and her conversational partners (at time t).

To reload the argument from disagreement, just modify the early dialog so that George is not part of the conversation when Sally speaks, but instead is eavesdropping nearby:

> (Local Eavesdropper)
> Sally says to her friend Jane, "Joe might be in Boston". Then George (who is eavesdropping in the closet) jumps out and says, "You are wrong! It's false that he might be in Boston. I just saw him down the hall."[9]

Here comes the one-two punch. First, the intuition is supposed to be that Jane and Sally disagree about whether Joe *might* be in Boston. Second, notice that the aforementioned brand of contextualism cannot explain this. According to that theory, Sally's claim is only about her knowledge and the knowledge of her conversational partner, Jane. George was not a conversational partner because (for

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[8] At least one of us, the present authors, is sympathetic to solipsism. We reflect in the final section on how a solipsist might think about our findings.

[9] The example is modified from MacFarlane (2011: 151). Incidentally, he uses the case to motivate retraction data, rather than disagreement data. Our use should not be contested. From the relativist's point of view, it is only because Sally and George cannot both be right (from any one point of assessment) that a retraction on Sally's part would be warranted in light of George's more informed claim.

whatever immature reason) he was hiding in the closet at the time of Sally's utterance. So Sally claimed that Joe's being is Boston is compatible with what she and Jane collectively know. And George denied that Joe's being in Boston is compatible with what *he*, Sally and Jane collectively know. Those are two distinct subject matters, and so, Sally and George are talking past one another. Indeed, they may both speak the truth, and so, (CGC) fails to accommodate the dispute.

At this point the contextualist has a number of moves. For instance she can deny that there is a decisive disagreement-intuition or she can deny that the above form of contextualism is flexible enough. We will revisit the disagreement intuitions in Section 3. Let us here follow MacFarlane's response to an increase in flexibility.

Here is one way to increase flexibility. Note that conversations do not occur at a time, but at a time-span. Perhaps a plausible contextualism should reflect this by claiming that a might-claim that p is true when and only when p is compatible with what is known by anyone who engages with the speaker or participates in the conversation. Such a theory may allow for the relevance of local eavesdroppers. For it dictates that they are relevant when in fact they join the conversation.

A weaker version of the restriction would dictate the relevance of anybody *in a position to join* the conversation. Call it (CGC-2) to indicate that it is another brand of Conversational Group Contextualism.

> (CGC-2)
> "It might be that p" is true as uttered by x (in a conversation that spans t1-tn) iff p is compatible with K,
> where K is the set of propositions collectively known by x and anyone in a position to join the conversation (between t1 and tn).

This sort of move invites an instance of a charge, found at MacFarlane (2011: 152), that if we can include the knowledge of local eavesdroppers as relevant to a might-claim, then it is less clear why anyone would take themselves to be in a position to make a might-claim. For they would have to have views about what is known by would-be eavesdroppers, whose existence they may not even be aware of. However, this instance of the charge would be overstated. For typically there are no local eavesdroppers (or local eavesdroppers in a position to join the conversation). And barring any good reason to think there are some, we are in a position reasonably to suppose that there are none.

MacFarlane's central argument against such flexibility is one more variation on our now well-rehearsed argument from lost disagreement. The variation modifies the dialog to include a *remote* eavesdropper---a listener who essentially is not in a position to join in the speaker's conversation. For MacFarlane (2011: 151) claims, "you'd assess [Sally's] claim the same way if [the eavesdropper] were thousands of miles away, listening through a wiretap." Here's a case of that kind:

(Remote Eavesdropper)
>Sally says to a friend, "Joe might be in Boston", and FBI agent Frank (who is eavesdropping by wiretap from a great distance) thinks to himself, "Wrong! It's false that he might be in Boston. I just saw him in Berkeley 20 minutes ago."[10]

Again comes the one-two punch. First it is alleged that *our* intuition is that Sally and Frank dispute an epistemic modal fact. Second, it is noticed that (CGC-2) cannot accommodate that dispute. After all, Frank is not in a position to join Sally's conversation. So his knowledge is not relevant to the content or truth value of her claim. Once again we find that, on the contextualist view in question, our subjects are talking past one another. They may both speak the truth, and therefore, are not in a state of disagreement.

MacFarlane sums up his thoughts about the contextualist strategy of increased flexibility:

>So far, the move away from solipsism seems well-motivated and plausible. The problem is that once we let data about third-party assessments … motivate an expansion of the contextually relevant group to include more than just the speaker, there is no way to stop this machine. The same kind of arguments that motivate expanding the relevant group of knowers to include George (in our [Local Eavesdropper] example above) will motivate expanding the relevant group of knowers to include anybody who will ever consider the claim.[11]

It is only because MacFarlane takes us to judge a disagreement between the speaker claiming that might-p and anyone who will ever consider that claim (who knows not-p) that he would claim that the contextualist needs to include such persons as part of the relevant group. But that is a questionable assumption. Whether any such person really is in a state of disagreement with the speaker (or that we intuitively judge so) is yet to be seen. We dispute the claim in Section 3 with empirical data. However, before we move on, let us examine just how serious MacFarlane's expansion-conclusion would be for contextualism, if it were true---that is, if the disagreement-judgment were as consistent across the entire class of structurally similar cases.

The resulting contextualist proposal would have to say that "might-p" is true just in case p is compatible with what is known by anybody who will ever consider the claim. Of course, on this view it is not clear why anyone would ever think they are in a position to assert a might-claim. It amounts to claiming, in cases where we are

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[10] Remote eavesdropping cases are considered also in Egan (2007) and Wright (2007). The former, but not the latter, is in agreement with MacFarlane on the force of this sort of case.
[11] MacFarlane (2011: 151).

ignorant about whether p, that nobody who will ever consider this claim will *ever* know not-p. We are generally never in a position to assert that. So if MacFarlane is correct, then contextualism entails a general unassertibility thesis.

These considerations would also strap the contextualist with *semantic unknowability*. A speaker is afflicted with this ailment when there is no way in principle for her to know what she is expressing at the time of her utterance. Since on the view we are considering, the content of an epistemic modal claim is determined at least in part by the epistemic states of subjects who will consider the claim in the future, and it is usually unknowable to the speaker at the time of utterance which people will eventually consider her claim, it follows that the speaker at the time of utterance is usually not in a position to know what she is expressing.

Another unacceptable consequence of MacFarlane's expansion-conclusion may be *semantic nihilism*, depending on one's metaphysics of the future. This is the view that our might-claims do not have any semantic content, given the non-existence of the future. For the content of our might-claims then depends on something that does not yet exist (viz., future circumstances in which people are considering our might-claims). Alternatively, *semantic instability* threatens if a single utterance at a given time has a content that changes later as more and more people consider that past utterance. Those are a few potential variations on the bizarre nature of epistemic modal content, if in fact the content of a presently expressed epistemic modal claim depends on what happens in the future.

And if we read MacFarlane's "anyone who will ever consider the claim" as being about both actual and possible subjects, then an even more catastrophic consequence emerges for a contextualist that accepts MacFarlane's disagreement data. Epistemic possibility more or less collapses into metaphysical necessity. For let x stand in a transworld relation to y. Then given the usual set-up of the argument, x and y disagree. Hence, the contextualist is committed to a very weak notion of "relevant group". It includes anyone that considers the claim and knows not-p---anywhere at any time *in any world*.   The upshot is that "might(p)" will be true at a context of use if and only if it is impossible to know not-p. Putting aside Fitch-paradoxical propositions (like 'p but nobody ever knows p'), it is impossible to know not-p just in case p is necessary. Therefore, at least for all non-Fitch paradoxical p, a might-claim that p will be true just in case p is necessary.

In sum, if (i) MacFarlane's disagreement data is robust, and (ii) the disagreement intuitions that motivate expanding the relevant group of knowers at all also motivate expanding the relevant group to include anybody who will ever consider the claim, then contextualism is in deep trouble. The foundation of the argument, however, is the disagreement data. So if MacFarlane's data is not robust (and the disagreement intuitions are not as widespread as he suggests), then the contextualist is not pressured to expand the relevant group so radically. She can stop the MacFarlanean machine before it dooms her thesis.

2. The Preclusion of Joint Accuracy

Disagreement, in MacFarlane's (2009: 4) target sense, is a *state* and not an activity. He is interested in the sense in which people disagree, and not in a sense in which people are *having a disagreement*. The latter he claims is what people do when they take themselves to be in a state of disagreement, and for this reason is less fundamental than the state of disagreement. Having a disagreement, MacFarlane points out, depends on peoples' actions and attitudes towards each other. By contrast, a state of disagreement depends only on their first-order attitudes, such that people can be in a state of disagreement even if they do not know of each other's existence. Two people may be in a state of disagreement without taking themselves to be in that state, and two people may take themselves to be in state of disagreement when in fact they are not in that state.

Moreover, MacFarlane is interested in a kind of disagreement that we can track and have intuitive judgments about. After all, relativism is alleged to explain, better than contextualism, why we have the intuitive judgments that we have about when there is and when there is not a epistemic modal dispute. If we do not track the relevant state, then relativism does not explain our overt judgments about the state. One must then take care when testing these judgments that our subjects are indeed tracking the relevant state, and not reporting on something else, like the activity of disagreeing. After all, presumably people are able to track both, and we wish our data to bear on the contextualism- debate that MacFarlane is framing.

MacFarlane (2007: 22-23; 2009: 11-13) asks us to depart from the traditional notion of disagreement, which says that two parties are in a state of disagreement just in case the one accepts the very same proposition that the other rejects. This phenomenon by itself does not always generate a disagreement in the relevant sense. Consider the case where I affirm that Obama is president, while my counterpart in an altogether different possible world (where Obama lost the election) correctly denies that Obama is president. Although I affirm the very same proposition that my counterpart denies, you do not judge my counterpart and I to be in a state of disagreement. There is no substantial dispute between us. We can both be right because both of our claims are accurate.

In the above example, my affirmation that Obama is president is true relative to the circumstance of evaluation that matters for the proper assessment of that affirmation (i.e., relative to the actual world), while my counterpart's denial that Obama is president is true relative to the circumstance of evaluation that matters for the proper assessment of his claim (i.e., relative to my counterpart's merely possible world). From your current point of assessment, both claims are *accurate*--- in the sense that each is true relative to the circumstance of evaluation that matters for its proper assessment. That is why, on MacFarlane's view, you may correctly judge that the two parties are not in a state of disagreement, even though one is affirming the very proposition that the other is denying. That is, from your point of assessment, their claims are both accurate. For MacFarlane (2007: 26), there is a

genuine disagreement in the target sense, only if from the given point of assessment the accuracy of one claim (or attitude) precludes the accuracy of the other.

MacFarlane's development of the notion of accuracy is debate-neutral in a number of respects. We say,

> An acceptance (rejection) is *accurate* just in case the proposition accepted is true (false) at the circumstance of evaluation that is relevant to the assessment of the acceptance (rejection) in its context…. (2007: 23)

The notion does not presuppose answers to interesting questions about which circumstance is relevant to the proper assessment of the target utterances. So for instance, if the circumstance that is relevant to the assessment of my utterance "Bob is sitting" is the world w and time t of my utterance, as advocated by a temporalist about propositions, then that utterance is accurate just in case the proposition expressed by "Bob is sitting" is true at <w, t>. By contrast, an eternalist like Frege, believes that a contingent proposition is about, among other things, the time of utterance. "Bob is sitting", as uttered at time t, expresses the proposition that Bob is sitting at t. Accordingly the circumstance that is relevant to the assessment of that utterance is merely the world of utterance. If the eternalist is right, then my utterance, "Bob is sitting", is accurate just in case the proposition expressed is true at the world of utterance. The contrast is between whether the contextually relevant feature, in this case a time of utterance, is built into the content of the claim or its circumstance of evaluation.

In the case of epistemic modals there is a further contrast. Not only does our contextualist and MacFarlane's relativist differ on whether the relevant state of information plays a content-determining role versus a circumstance-determining role, they differ also on what they take to be the relevant state of information. Our contextualist takes the relevant epistemic state to be some function of the speaker's use, while MacFarlane's relativist essentially takes it to be a function of the assessor's assessment of that use. Since the two positions differ on both the content and the relevant circumstance of evaluation of a given epistemic modal utterance, there are at least two possible reasons why they may differ on their verdicts about the accuracy of such an utterance. They may differ on the proposition expressed or on the circumstance that matters. But nothing in the notion of accuracy appears to beg the question one way rather than the other on either of these fronts.

MacFarlane's (2009: 10) target sense of disagreement, *preclusion of joint accuracy* (PJA), depends on the notion of accuracy and is intended to be debate-neutral as well. (PJA) says,

> x and y disagree with respect to their attitudes/utterances just in case the accuracy of one precludes the accuracy of the other.

Another formulation (2007: 24) says that x and y disagree in the target sense just in case "the acceptance and the rejection *cannot* both be accurate."[12] For the case of contingent claims uttered by x and y, these two explications are meant to come to the same thing. Nothing theoretical is added to this target sense of disagreement that appears to beg the question in favor of relativism over contextualism (or vice versa).

The contextualist and relativist disagree about which notion of accuracy matters for the truth or falsity of epistemic modal claims. Do we evaluate modal epistemic claims relative to simply a world as our contextualist will argue, or relative to both a world and the assessor's information state as a MacFarlanean relativist will argue? Or is there some other circumstance that matters? Let us assume with MacFarlane that answers to these questions are reflected in the empirical data---and in particular by where we judge the presence of joint accuracy. Then we need only uncover the notion of accuracy that best accommodates those judgments once surveyed.

3. Disagreement Intuitions Surveyed

We designed two studies to test native English speakers' judgments about the presence of epistemic modal disagreement, in the sense of "disagreement" that we have been discussing. We varied the conversation relation between x and y---testing for disagreement in intra-conversational and various inter-conversational circumstances. Specifically, we placed x and y in ordinary conversational, local eavesdropping, remote eavesdropping, and completely independent conversational circumstances. In the first study we employ only cleaned up versions of cases from the literature on epistemic modals---cases that have been used to motivate contextualism or relativism. In the second study we aim for more objectivity by first diversifying the subject matter (and setting) of the epistemic modal conversations while holding the conversational relation fixed, and second, by diversifying the conversational relation while holding the subject matter and setting fixed.

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[12] MacFarlane (2007: 24; 2009: 11-12) acknowledges that these explications of disagreement are difficult to elucidate further to handle special cases where it is impossible for both parties to be accurate just because it is impossible for one of the parties to be accurate. Some such cases are a problem since they are not intuitively judged to constitute a disagreement---for instance, when I claim, "The cat is on the mat." and you claim, "Hesperus is not Phosphorus." we do not seem to disagree, even though it is not possible for both claims to be accurate. Our study will not concern such special cases, since we restrict our discussion to the contents of attitudes and utterances that have their truth values contingently.

All vignettes for both studies contained cues to tip off the subjects to the epistemic readings of the modals, including indications that epistemic states were the reasons for assertion.[13] After highlighting the modal utterances of both speakers, we asked,

> "Do you agree it is possible in this case for both of their claims to be
> true (at the same time)?"

The wording ensures that the subjects are evaluating for a state of disagreement (and not an activity of disagreeing). It also makes clear that we are not asking whether or not the subjects are merely justified.

Subjects self-reported their native language, and we excluded the data of those who reported anything other than English. Because subjects were not excluded from completing the experiment on the basis of native language, there would be no incentive to lie about it. Of course, this being an internet-based survey, we cannot be certain that all of the subjects were telling the truth about their native language. The same is true, however, of most traditional in-person survey protocols; we rely on subjects to be honest. No other demographic information was gathered; this is because we expected subjects would be less likely to participate in an online survey that requested extensive demographic information, and because gathering more information may have required IRB approval.

We ran two screening questions, which were used to disqualify some subjects. This was done with one narrative, (Ticket Cost), involving a clear disagreement about the precise amount paid by x and y for their flight to Puerto Rico,[14] and a second narrative, (Indexical Claims), involving indexical utterances that were obviously compatible (viz., x saying, "I'm hungry", and y replying, "I'm not hungry"). Subjects that missed the obvious answer to the disagreement-question for either of these two narratives were eliminated from the study. These screening questions had several purposes. First, the clear-disagreement question was used to make sure that subjects understood the questions to be about compatibility, rather than justification. Second, these questions were used to eliminate subject with a strong bias to respond with either agreement or disagreement regardless of the context. And finally, the questions were used to exclude subjects who just weren't paying attention or cooperating.

Study #1
This MTurk study included four vignettes: (Fred), (Boston), (Bus Stop) and (FBI). There were 265 admissible subjects, each receiving the two screen questions (in random order) and one of the four test questions. We begin with the case of

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[13] One further way to ensure an epistemic, rather than counterfactual, reading would be to use "may" rather than "might". "May" is more difficult to hear non-epistemically. Our study could be improved by this modification to the questions.
[14] That question was used in Study 2, while a similar clear dispute about the precise date of a friend's birthday was presented in Study 1.

(Fred).[15] It is the kind of case that both Kratzer and DeRose use to motivate contextualist treatments of epistemic modals.

> (FRED)
> Suppose a man is approaching both of us. You and I are not together, and you are much closer to him than I am. I can only see the bare outlines of this man. I say to myself, "That person might be Fred". You on the other hand, being much closer to this man, are thinking, "That person can't be Fred. I know Fred doesn't have a mustache."

- I said: "That person might be Fred."
- Your thought was: "That person can't be Fred."

> Question: In this case, my claim and your claim can both be true (at the same time). Do you agree or disagree?

In (Fred) we find two subjects independently seeking the same person, Fred. They are not in contact with one another. This however does not beg any questions against MacFarlane, because---as we noted---disagreement is a state that does not essentially involve an activity between two or more persons. Whether the two parties are involved in the same conversation is irrelevant to whether they are in a state of disagreement.

So, are the two subjects disagreeing in (Fred)? Contextualism, ala Kratzer or DeRose, predict NO. The position predicts that both claims can be true (at the same time), since the truth values of the two modal claims depend on distinct utterance contexts. The contexts importantly differ on the relevant information available to the subjects.   By constrast, MacFarlane's relativistic version of PJA predicts disagreement between the claims of the two parties. Relative to any one state of assessment only one of the two parties can be right. So qua assessor, the informant is predicted, according to relativistic-PJA, to intuit a disagreement between them.

Responses to the questions were analyzed for statistical significance using a logistic regression model.[16] What we find is that informants agree that both speakers can

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[15] Modified from Kratzer (1986: 9) Our narrative differs from her version in that we do not suggestively build the contextualist answer to the question into the narrative. See Nat Hansen (2011) for discussion of this confound as it appears in the epistemic contextualist literature.

[16] Generally speaking, this is a model that investigates the effect of some experimental manipulation on the likelihood of a response variable. In a logistic or logit model, the response is binary (yes/no). In this case, the experimental manipulations are the various forms of the modal question, and the binary response variable is agree/disagree. What we model here is how particular modal questions affect the likelihood of subjects' responding 'agree'. In particular, this model takes as its dependent variable the log odds (or logit) of an 'agree' response. This is the

be right about 62% of the time, a level significantly above chance: $\beta = 0.489$, $z = 2.00$, $p < 0.05$. If the judgments about disagreement are tracking a preclusion of joint accuracy, then the results do not favor a relativist reading, but do favor a contextualist reading of accuracy.

We turn now to (Boston). It is the kind of case that MacFarlane uses to motivate relativist treatments of epistemic modals.[17]

> (BOSTON)
> Sally and George are discussing Joe's whereabouts. Sally says, "Joe might be in Boston." George replies, "Joe can't be in Boston. I just had breakfast with him here in Los Angeles 30 minutes ago."
>
> * Sally said: "Joe might be in Boston."
> * George replied: "Joe can't be in Boston."
>
> Question: In this case, Sally's claim and George's claim can both be true (at the same time). Do you agree or disagree?

A natural non-solipsistic contextualism will predict a disagreement here. So it predicts disagreement with the claim that both parties can be right. After all, non-solipsistic contextualism allows that the context of utterance is broad enough in an ordinary conversational setting to make relevant the information that is available to the conversational participants collectively. On this understanding Sally and George each make claims about the same body of information. Of course, relativism agrees with the verdict but for a different reason. Relativism predicts that our informant will evaluate both modal claims against her own body of information. Whatever that information happens to be, one party will be wrong if the other is right. For either Bill's being in Boston is compatible with her information or it is not. Hence, the speakers cannot both be right (at the same time).

Here we find that only 37% of informants agree that the speakers can both be right, significantly less often than chance: $\beta = -0.533$, $z = -2.20$, $p < 0.05$. The tendency to agree that both parties can be right here is significantly below (Fred). It is also significantly below (Bus Stop), which we discuss below: $\beta > 1$, $z > 2.5$, $p < 0.01$ for both comparisons. So the result is a tendency toward disagreement in (Boston).[18]

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natural logarithm of (p (agree) / p (¬agree)). In what follows, results are reported with a coefficient β, which is the size of the effect in log odds; a *z* score, also known as a Wald z statistic; and a *p*-value, the probability of type I error (rejecting a true null hypothesis) associated with the Wald test statistic.

[17] Modified from MacFarlane (2011)

[18] The comparison between (Boston) and (FBI), presented below, does not reach statistical significance.

That result is consistent with relativism, but it also consistent with non-solipsistic contextualism.

Let us now look at (Bus Stop), which is a case of local eavesdropping. Preliminary surveys revealed that subjects were heavily distracted by cases like MacFarlane's that had eavesdroppers jumping out of closets. So we tested this more natural example:

> (Bus Stop)
> Sally arrived at the bus stop a bit late with her friend Betty. Sally worries, "We might have missed our bus." A bystander, George, is quietly eavesdropping. He mutters to himself, "They can't have missed their bus. I've been here for an hour and know that the bus has not yet arrived."
>
> - Sally said: "We might have missed our bus."
> - George muttered: "They can't have missed their bus."
>
> Question: In this case, Sally's claim and George's claim can both be true (at the same time). Do you agree or disagree?

Contextualists who by default treat only the knowledge of the conversational participants as relevant will predict here no disagreement---that the subjects can both be right. After all, Sally and George are not part of the same conversation. Relativists by contrast will once again predict a disagreement. Again, they say that Sally and George cannot both be right from any one point of assessment.

74% of the time our subjects agree that both parties can be right, significantly above chance: $\beta = 1.030$, $z = 3.01$, $p < 0.001$. The result is predicted by contextualism, but not relativism. We find significantly more agreement here than in (Boston), which, recall, had an effect in the direction of intuited disagreement.

What happens in cases of *remote eavesdropping*?[19] For instance,

> (FBI)
> Sally and George are having a conversation at home and discussing Joe's whereabouts. FBI Agent Frank has planted a bug, and from headquarters is eavesdropping on their conversation:
> George: "Do you know where Joe is?"
> Sally: "No I don't. But he might be in Boston. He considered going there for an important meeting."
> FBI Agent Frank (to a colleague at headquarters): "Joe can't be in Boston. Our guys arrested Joe in Los Angeles 20 minutes ago."

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[19] The example here is modified from Crispin Wright (2007).

- Sally said: "[Joe] might be in Boston."
- Agent Frank Replied: "Joe can't be in Boston."
  Question: In this case, Sally's claim and Agent Frank's claim can both be true (at the same time). Do you agree or disagree?

There are expressions of skepticism about MacFarlane's claim that there is a clear intuition of disagreement in (remote) eavesdropping cases.[20] And the contextualist of course would deny disagreement here and predict a pattern of subjects who agree that Sally and Agent Frank can both be right. What do our results show?

The result does support the conclusion that remote eavesdropping cases are not obvious cases of disagreement. Our informants did not know what to make of (FBI), with almost exactly 50% agreeing that both speakers can be right. Comparisons to (Fred) and (Boston) here, though on the order of 10-15% difference, do not reach statistical significance. (FBI) does, however, elicit significantly fewer 'agree' responses than (Bus Stop): $\beta = 1.030$, $z = -2.63$, $p < 0.01$. In other words, subjects are as likely to intuit 'agree' here as they are to detect a dispute, but not as often as in our local eavesdropping case, (Bus Stop). It is not clear why the two eavesdropping cases should differ significantly in this way. One possibility is that is that (FBI) is inherently a more adversarial context than (Bus Stop). For instance, FBI agents are likely to disagree with people they are pursuing or investigating. If the difference really is due to idiosyncratic properties of the specific subject matter used here, future investigation of a greater variety of contexts should bear this out. Moreover, remote eavesdroppers, unlike local eavesdroppers, are predictably adversarial

The next study, presented below, uses a wider variety of contexts and finds no such significant difference between local and remote eavesdropping cases, and shows that non-modal subject-matter does have a significant affect on epistemic modal judgments.

An alternative explanation of the randomness of the (FBI) result might be foreshadowed by von Fintel and Gillies (2011) and Kratzer (2009), who advocate a special brand of flexible contextualism that predicts indeterminacy in eavesdropping cases owing, as Kratzer puts it, "to the absence of any overt or contextually suggested relativization." However, a question remains about why we would not find an analogous randomness for (Bus Stop), the local eavesdropping case. Barring further study, the indeterminacy view would have to explain how an increase in the distance of an eavesdropper leads to a decrease in the overtness of contextual relativization. However, as suggested Study 2 below, there really is no significant difference between remote and local eavesdropping judgments, so perhaps the indeterminacy view is relieved of that explanatory burden.

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[20] Versions of the criticism appear in Kai von Fintel and Tony Gillies (2008: 79, 81) Kratzer (2009: Slide 68), Hawthorne (2007), et. al.

Let us sum up the findings and lessons of Study 1. The primary lesson is that MacFarlanean relativism overgenerates epistemic modal disagreement. It mistakenly predicts that (Fred), (Bus Stop), and (FBI) are all cases of intuitive dispute, while the empirical data does not bear this out. Relativist-PJA is not what is tracked by competent informants' judgement about the cases. Dialectically, contextualism is then in good standing. It is treated, even by MacFarlane, as the default position. Without the amount of disagreement that MacFarlane predicts, the argument from disagreement fails because its presupposed data is not robust. Contextualism is then unmoved from its default status.

That said, Study 1 by itself does not fully support contextualism either. Although a non-solipsistic contextualism predicts the first three results, (Fred), (Boston) and (Bus Stop), it does not predict the (FBI) result. So although local eavesdropping result for (Bus Stop) is evidence for the contextualist prediction, (FBI), our remote eavesdropping example, is not evidence for contextualism. In (FBI) subjects were as likely to intuit disagreement as they were agreement. We have suggested that this may be due to the inherently adversarial nature of the (FBI) scenario, or possible the adversarial nature of remote eavesdropping of any kind. We chose in the first study to test cleaned up versions of examples already operating in the literature. For those are among the familiar cases that have been used to motivate the contextualist and relativist positions, and it is those specific motivations that we are evaluating. Study 2 by contrast aims for minimal sequences to flesh out the affects of non-modal subject matter on studies like Study 1.

Study #2
In the second study we duplicated from Study 1 the format of the test questions. However, we aimed to diversify the conversational relation while holding the subject-matter (and setting fixed) and aimed to diversify the subject-matter (and setting) of the conversations while holding the conversational relation fixed. There were four conversational relations (i) *normal conversation*, which involves x and y in the same conversation, (ii) *unrelated conversations*, which involves x and y in two independent conversations with neither speaker involved with the other, (iii) *local eavesdropping*, which involves a nearby listener, and (iv) *remote eavesdropping*, involving a listener that is not in a position to join the original speaker in conversation.

For each of the four conversational relations there were four scenarios regarding overall subject-matter of conversation and environment in which the conversation occurred---specifically, utterances (a) in a coffee shop about a performer, (b) at the bus stop about the arrival of the bus, (c) in the class room regarding the passing of a math test, and (d) in the setting of an academic journal regarding research on the origins of the Mesoamericans.

We conducted four distinct questionnaires (via MTurk), each included the two screen questions plus four test questions. No one study duplicated either a conversational relation or an environmental scenario. So every conversational relation and every environmental scenario were represented once in every study, with no subjects taking more than one study. There were between 120 and 150 admissible native English subjects in each of the four questionnaires (after eliminating for over-generation or under-generation of disagreement in the screen questions).[21]

Study 2 was analyzed with a mixed-effects logistic regression model using crossed random effects of subject and subject-matter. Our general findings are that, with a few exceptions, (1) subjects' likelihoods of judging epistemic modal disagreement are not much different from chance; (2) differences in conversational relation (e.g., normal conversation vs eavesdropping) do *not* affect the likelihood of these judgments; and (3) situational differences (i.e., those differences in non-modal subject-matter and setting of the vignettes) *do* affect the likelihood of such judgments. We discuss these in that order.

First, crossing the parameters on the question of whether our subjects detected a genuine dispute, the results were not much difference from chance (0.5). Although, 6 of the 16 modal questions do elicit response patterns that differ from chance (boldfaced in the chart below):

	Normal Conversation	Unrelated Conversations	Local Eavesdropping	Remote Eavesdropping
Coffee	0.4545455	**0.3596491**	**0.3846154**	**0.376**
MathTest	0.4473684	0.4090909	0.4	0.4380952
BusStop	0.5428571	0.5322581	0.5545455	0.5526316
Academic	**0.64**	**0.5714286**	0.5087719	**0.6727273**

The screening questions were more clear-cut. The percentage of subjects detecting dispute for the modal questions ranges from 36% to 67%. By contrast, for the non-modal screening questions, only 24% judged no dispute to an obvious disagreement (Ticket Cost), and 97% claimed no dispute for an obvious non-dispute in (Indexical Claims). This reflects the fact that intuitions are less consistent across subjects evaluating for modal disagreement than they are at evaluating for non-modal disagreement. In other words, these are much more difficult judgments than the obvious cases used in the screening.

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[21] As expected, almost all subjects, around 95%, agreed that in (Indexical Claims) both x and y may speak the truth, and most subjects, approximately 73%, correctly denied in (Ticket Cost) that both may speak the truth. Hence, a strong majority of subjects appear to be relatively attentive.

4 of the 6 questions that do reflect results better than chance are consistent with what would be predicted by a non-solipsistic conversational-participants contextualism. Those were (Coffee, Unrelated Conversations), (Coffee, Local Eavesdropping) and (Coffee, Remote Eavesdropping), all of which lean significantly toward "no disagreement", and (Academic, Normal Conversation), which leans significantly toward "disagreement". 3 of the 6 questions that reflect results better than chance are consistent with what would be predicated by the relativist. (Academic, Normal Conversation), (Academic, Local Eavesdropping) and (Academic, Remote Eavesdropping), all of which lean significantly toward "disagreement". However, the preponderance of results are evidence for neither "disagreement" or "no disagreement", and suggests, for a truth conditional semanticist, that either there is widespread indeterminacy of content or massive interference perhaps owing to situation effects of the cases.

The second general finding is that the linguistic relation does not affect the likelihood of detecting epistemic modal dispute. Here are the percentages of subjects judging a disagreement across linguistic conditions:

Across Linguistic Relations

Normal Conversation	Unrelated Conversations	Local Eavesdropping	Remote Eavesdropping
0.52	0.47	0.46	0.51

These percentages do not favor the raw predictions of any of the theories we have been discussing. For instance, a conversational-group contextualism would predict that eavesdropping would elicit a notable decrease in subject's inclination to detect a dispute as compared to a normal conversational setting. There is only one significant difference along the scale shown above: subjects are significantly less likely to judge disagreement across unrelated conversations than between speakers in a normal conversation: β = -0.34, z = -2.10, p = 0.036. The less reasonable solipsistic contextualism, however, would predict little differences across conversational relations, predicting no disagreement in any case, including in the normal conversational environment. And relativism would share the expectation of little difference, but in the opposite direction---predicting disagreement across all the conversational types. However, this aspect of the data supports neither position. The disagreement judgments are generally not significantly more or less likely than chance for any given linguistic condition. So the data generally supports neither disagreement nor no-disagreement for any given linguistic relation.

The third general finding is that there are significant situation effects . In particular we found that the (Academic Conversation) and (Bus Stop) results showed an increased tendency to acknowledge dispute as compared to the (Math Test) and (Coffee Shop) results, independently of the linguistic relation between the speakers.

Across Subject Matters/Settings

	CoffeeShop	MathTest	BusStop	Academic
	0.39	0.42	0.55	0.60

Like with (FBI) in Study 1, (Academic Conversation) may carry an increased tendency to acknowledge dispute because of its inherently adversarial nature. Academics in journals typically disagree with the colleagues they are engaging and debating. The pattern developing is that adversarial subject-matters/settings carry an increased tendency toward judging epistemic modal dispute. This perhaps explains the oddity in our eavesdropping results in Study 1. There we found that the remote eavesdropping (FBI) result came back with significantly fewer subjects agreeing that both parties may speak the truth, as compared to the local eavesdropping (Bus Stop) result.

Here is the Study 2 data in chart form:
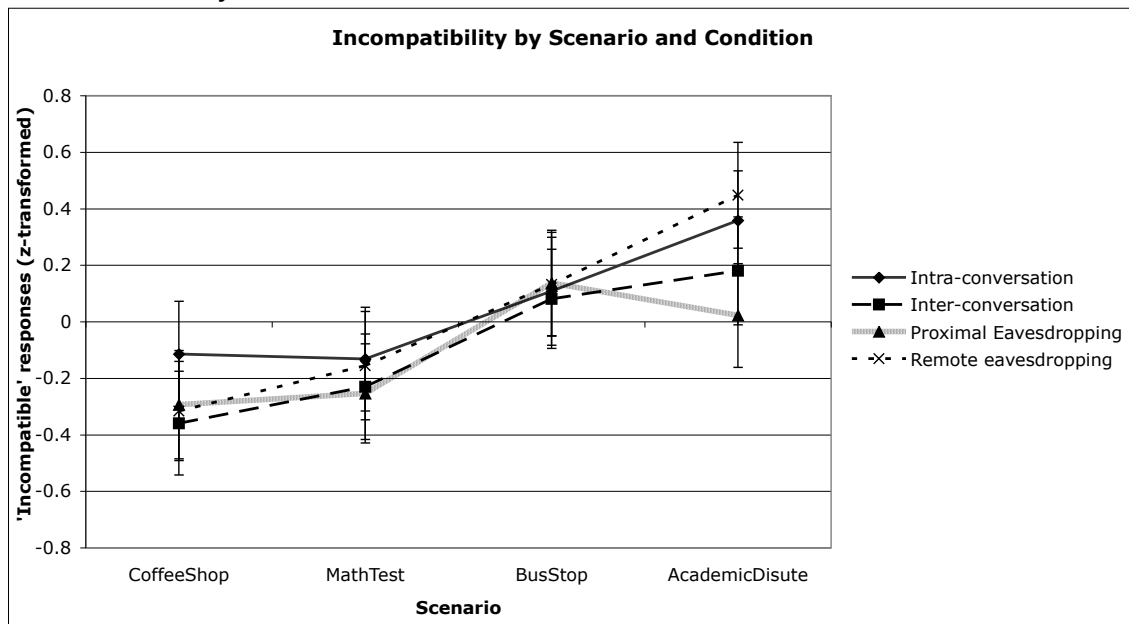
In the above chart, "intra-conversation" refers to what we have been calling a "normal conversation", and "inter-conversation" refers to what we have been calling independent or "unrelated conversation." 0 corresponds to chance (50% agreement that the two parties can simultaneously speak the truth), negative numbers correspond to lower than chance agreement (i.e., tendency toward "no disagreement"), and positive numbers correspond to higher than chance agreement (i.e., tendency toward "disagreement"). Error bars represent the 95% confidence intervals.

That differences in subject-matter have an effect on epistemic modal judgments should be surprising to both contextualists and relativists. That is because neither framework antecedently has resources to explain such differences. Instead, they predict that disagreement judgments essentially on variations in the epistemic

states of the relevant subjects, and not on objective features of the non-modal subject-matter under discussion.

Like with the first study, Study 2 does not generally support relativist predictions. Only two of the sixteen test questions came back with results consistent with relativism while inconsistent with contextualism, and those both involved "adversarial" academic dispute scenarios. That non-modal subject matter in particular, as compared to many other non-modal subject matters, carries a principled bias towards disagreement.

The primary conclusion we draw is that disagreement intuitions are not after all tracking relativistic-PJA. Indeed, Study 2 suggests that ordinary people may not be easily tracking *any* notion of joint accuracy in this domain. Otherwise, their responses would be more uniform.

Recall our understanding of MacFarlane's position: if (i) his disagreement data is robust and (ii) the disagreement intuitions that motivate expanding the relevant group of knowers at all motivates expanding the relevant group to include anybody who will ever consider the claim, then contextualism is in big trouble. In section 3 we questioned (i) at length. Since MacFarlane's data is not robust, part (ii) loses its force. The contextualist semantics, as the default position, only needs to accommodate clear cases of genuine dispute. What we learned is that not many cases from the relativist repertoire and even fewer cases from Study 2 fit that description. To that extent the most fundamental motivation for relativism is without legs, since the disagreement data does not favor its notion of joint accuracy.

As a refutation of relativism, Study 1 and Study 2 are overly conservative experiments. Asking a subject to evaluate the linguistic situation in the way that we did might indicate to the subject that it is the subject's own background that is relevant for determining the truth values of the epistemic modal claims. In such a case our way of asking the questions would then bias judgments in favor of the relativist's assessor-sensitive predictions. Relativism, after all, avows that our subject becomes the assessor. Still, no such bias surfaced in the results.

There are other lessons to highlight from the experiment. Subjects appear to have great trouble evaluating for "preclusion of joint accuracy". Why would this be? Is it that epistemic modal disputes (if there are any) are simply and predictably harder to track than ordinary non-modal disputes? Study 2, and its lack of consistency, suggests that subjects may not be tracking epistemic modal dispute at all, but instead are susceptible to situation effects of the narratives.

Perhaps solipsism has something to say here. If epistemic modal disagreement were sufficiently rare or impossible (as solipsistic contextualism would suggest), then perhaps subjects would be just a little baffled and would be simply trying to do their best to make sense of a preclusion-of-joint-accuracy study. Of course this raises the question of why our subjects did not all just answer 'they can both be right' on every

trial. However, if the notion of epistemic modal disagreement is not well-formed in the first place, then the question that we are asking is confusing. And rather than answering the straightforwardly 'right' way, subjects are looking for ways of making the question make sense.

If subjects really have no idea how to respond to our prompt, for whatever reason, then instead of trying to answer the question, subjects are just latching onto whatever extra-linguistic world knowledge might influence the prior probability of disagreement happening (e.g., academics and remote eavesdroppers are a priori more likely to disagree with the people they are listening to). And these effects are massive, the largest we found in the study. There is also a moderately robust difference between normal-conversational and unrelated-conversational judgments (i.e., intra- and inter-conversational, respectively, on the chart), but it is dwarfed by the effect of context. This means that, while non-semantic 'situational' effects are the largest and most robust discovered in this experiment, we do still uncover some generalizations about how linguistic relations affect the preclusion of joint accuracy.

People can judge the truth or falsity of epistemic modal constructions when given a clear picture of contextual common ground, but asking them to shift that common ground away from the context where a sentence was uttered to common ground from a new context where either an eavesdropper or the people giving the experiment have added more information (in order to compare the truth conditions of statements made in the two contexts) is just too difficult a task for people to perform.

Relatedly, it may be that 'true at the same time' is not a predicate that applies to two epistemic modal claims that were made in different epistemic states. For instance, if the index of evaluation always includes the speaker's own epistemic states (perhaps together with other standard parameters like worlds and times) then there is no single index of evaluation relative to which the two claims are true. So even if the corresponding solipsistic PJA were the index of evaluation that matters for the proper evaluation of epistemic modal discourse, subjects might be very confused by our survey questions.

The picture that emerges from our results is that people intuit disagreement more often in direct conversational interactions than between people in unrelated conversations (although judgments are not particularly clear in either case), and intuitions are all over the place with regard to eavesdropping cases of any kind, essentially tracking properties of the general context rather than anything specifically semantic.

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