Assertability Constraints and Absurd Assertions[*]

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Intuitions about truth-conditions often break down. When they do, the question inevitably arises: is the breakdown due to semantics, or pragmatics? Absurd assertions, those that sound weird, and whose truth-values are often difficult to judge, act as stress tests for theories of linguistic interpretation. For instance, when faced with puzzles concerning the interpretation of indicative conditionals, some (eg. Grice [17], Lewis [26]) maintained the material analysis and explained the puzzles away as by-products of norms of communication. Others (eg. Stalnaker [33]) changed the semantics and developed formal pragmatic principles to deal with the puzzles. The general point is that, any time we are faced with such stress tests, we are faced with a difficult decision problem: where do we locate the source of the difficulty?

In this paper I will examine a handful of absurd assertions, hoping to use them as stress tests against our theories of semantics and pragmatics. For each such case, there have been, and can be, many stories to be told about why they are odd. I will not engage with this literature at all in my short note here. I will opt instead to offer a system of interpretation which, for a class of absurd assertions, can characterize what it is about them that makes them unassertable.

I will assume a dynamic semantic system of interpretation (Heim [21]), in which the meaning of a sentence is its context change potential (CCP). On top of these meanings I will lay out general conditions on when a context c "admits" a sentence ϕ, generalizing from the standard admittance requirement of presupposition satisfaction (Karttunen [23], Stalnaker [32], Heim [21]). The essence of the idea is to take constraints that are naturally thought to be operative at the global level of speech acts, and to impose these constraints on the local updates defined in the formal semantics. A context c will be said to *admit* a sentence ϕ if the execution of ϕ's CCP on c does not violate any of the constraints. If c does not admit ϕ, ϕ will be unassertable in c. It can further be shown that some sentences are never assertable, i.e. that no context at all admits them.

1 Absurd Assertions

1.1 Gibbard Phenomena

Consider something like the following story. There are three people in a room, A, B, and C, all of whom are suspected for murder. Mr. X knows which of the three actually did it. He will let the two innocent ones go, leaving the remaining individual as the murderer. John and Mary are looking into the room through separate peepholes. They are unable to communicate with each other, though they each have a partner with them taking notes. John sees A leave, and asserts to his notetaker:

1. If C didn't do it, B did.

Mary sees B leave, and asserts to her notetaker:

2. If C didn't do it, A did.

A puzzle that has been raised for theories of conditionals is the following. Both speakers made no mistake at all in their assertions, nor was their personal information incorrect in any way, nor did they leap to false conclusions. Hence, they can't both be false. However, no single agent could appropriately assert both (1) and (2) in the same breath without sounding as though she were contradicting herself:

3. #(If C didn't do it, B did) and (If C didn't do it, A did).

Hence, the conditionals can't both be true. Finally, since there is no reason to lay truth on one as opposed to the other, it would seem that we are forced to conclude that it might be best if conditionals were not assigned truth-conditions at all.[1]

I would like at this point to try to frame the puzzle a bit more theory neutrally. I will take as established the intuition that the individual acts of assertion (1) and (2) seem smooth, and that it would be strange if John were also to assert (2), or Mary (1). Since truth-value judgments are difficult in such scenarios, I will abstract away from them and focus on the data that are clear, viz. data concerning how felicitous we find such assertions. The question I would like to then ask is: how can we account for the judgments of oddness?

I believe that the puzzle is actually more complicated than standardly presented. First, the difficulty is not in any way limited to indicative conditionals. Consider again the scenario just as above. In such a context, John would be perfectly OK uttering:

4. B or C did it

Likewise, Mary would seem to be fully warranted in uttering:

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[1]The above formulation of the Gibbard scenario is based heavily on a handout of Kai von Fintel's on indicative conditionals (von Fintel [6].

5. A or C did it

In such a scenario, we sense that John would be erring if he were to follow up his utterance (4) by uttering (5). Similarly for Mary. We should like for there to be a general account of why, in these scenarios, each speaker seems to be playing the assertion game perfectly, while they wouldn't be doing so if they were to attempt to assert the conjunction of each utterance.

Furthermore, imagine now that Madame X is watching John and Mary, but is unable to see inside the room. Given John and Mary's individual assertions, she can rationally and easily conclude that C is the murderer. In addition, if John and Mary hand their notes to each other, they will also both come to conclude that C did it. Note that this note-passing is a perfectly acceptable way of exchanging their information. No issue of oddness arises. However, imagine now that they meet to discuss their findings. They want to figure out, together, the answer to the question, *Who did it?* Now, observe that if John speaks first (i.e. he utters either (1) or (4)), Mary can no longer felicitously respond with (2) or (5). What was once a perfectly reasonable thing for her to say is no longer acceptable. Finally, Madame X, with all the information at hand, cannot utter (3) to her personal notetaker.

If we assume a material implication analysis of conditionals,[2] and the standard meaning of disjunction, the conclusions about the inferences that get drawn (that C did it) when things go smoothly follow straightforwardly. But if we do indeed assume these meanings, then the conclusion (that C did it) follows just as well when the conversation does not flow smoothly. If that is so, what explains the (in)felicity? If truthful speech emerges (given the meanings), what else constrains speech so as to render only some of the above truthful assertions as felicitous?

1.2 Or-to-If

Consider the following argument:

6. Either A did it or B did. Therefore, if A didn't do it, B did.

This argument strikes us as compelling; indeed, it strikes us as valid. However, it is well-known that if we accept the validity of the argument, then the indicative conditional must be equivalent to the material conditional. And this conclusion leads to many worries, such as (inter alia) the well-known paradoxes of material implication.[3]

Stalnaker [33] manages to derive the compelling intuition of validity without equating indicative and material conditionals. First, he provides a semantic analysis of indicative conditionals which is not equivalent to the material conditional. Second, to account for the apparent valdity of the or-to-if inference,

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[2]By "material conditional" I mean the standard logical treatment of conditionals: "if A, then B" is equivalent to "not A or B".

[3]We will have occasion to look at these paradoxes in the next section.

he defines a pragmatic notion of "reasonable inference." By stipulating certain natural appropriateness conditions on the use of disjunctions and on the selection functions in his semantics of conditionals, he shows that the or-to-if inference, though not semantically valid, is pragmatically reasonable in a well-defined sense.

In this note, I will not take objection with Stalnaker's analysis. Instead, I would like to note that the or-to-if inference does not invariably go through. For example, when presuppositional items are involved, we can create sentences where, say, the disjunction seems felicitous and true, while the corresponding conditional seems infelicitous and perhaps even contradictory:[4]

7. Either the bathroom is upstairs or there is no bathroom in the house

8. #If the bathroom is not upstairs, there is no bathroom in the house

1.3 Paradoxes of Material Implication

Under the assumption that the indicative conditional is equivalent to the material conditional, the following statements are all true. Nonetheless, they all strike us as somewhat odd:

9. #If A didn't do it, B did.[5]

10. #If B didn't do it, A did.

11. #If A didn't do it and A did do it, then C did it.

12. #If Paris is in Canada, I'll meet Chomsky tomorrow.[6]

13. #If I meet Chomsky tomorrow, Paris is in France.
    etc.

Are the above sentences true or false? If they are true, as the material analysis would have us believe, why are they so odd? If they are not true, why do they not strike us obviously false? For instance, imagine that John and Mary have a bet. Here is the scenario: Some person is about to make a speech act. This person is known to play quick and loose with the truth, but is not so consistent as to be predictable (suppose she is a random truth generator). John and Mary both put in $5. The bet is: If what the speaker says is true, John wins the stake. If what the speaker says is false, Mary wins the stake. The speaker then makes the offending assertions (9)-(13). John and Mary disagree about who won the bet. They take it to you to adjudicate. What do you do? Award John the stake, award Mary the stake, or call the bet off?

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[4]Focussing only on the presupposition induced by *the bathroom* and ignoring the presupposition induced by *the house*.

[5]Said when it is common knowledge that A did it. Likewise for (10).

[6]Said when the correct geography is common knowledge. Similarly for the next example.

1.4 Moore's Paradox

Here is a long-standing puzzle, known as Moore's Paradox: Why is the following sentence infelicitous?

14. # It is raining and I don't know that it is raining.

Sentences of the form *p and I don't know that p* are consistent in standard modal logic. For instance, imagine there are two worlds, {u,v}, and suppose it is raining in u and it isn't raining in v. Suppose further that world v is compatible with what Mary knows in world u. In such a model, $p \wedge \neg K_m(p)$ is true in u. If it is true, why is it not assertable? And why does it sound contradictory?

2 Constraints on Context Change

Truth and assertability seem to come apart in quite radical ways. I will now try to outline a theory of assertability couched within a dynamic semantic framework (eg. Heim [21]). I will try to show that the resulting system predicts precisely the conditions under which judgments of truth/falsity should be clear, and when not. I will claim that taking assertability as a more fundamental notion than truth meshes better with our intuitions about the interpretations of sentences. Since truth-value judgments are predicted from the theory of assertability, nothing of the semanticist's toolkit will be lost.

2.1 Knowledge, Contexts, and Constrained Speech

I begin by making a rather strong assumption. I assume with Williamson [34] that speakers are bound by the following (pragmatic) constraint on assertion:

Knowledge Norm of Assertion Assert ϕ only if you know ϕ.

I will not defend this assumption here, though I believe that empirical evidence can be adduced in support of it. I will content myself with simply assuming it to see how far we can get with this assumption in place. Second, I will equate the notion of "common ground" with the technical notion of common knowledge. Assume further (for now) that "if," "and," "or" etc. receive their standard logical meanings.

Now consider the Gibbard scenario. We predict immediately that John can only assert (1) and (4), and not (2), (3) and (5), for he only knows the former, and not the latter. We reason similarly with Mary. But we still can't say: why is Madame X unable to assert (3)? For note that she does indeed know (3), since she knows that C is the murderer.

2.2 Constrained Dynamic Semantics

I will assume without discussion a dynamic semantic model of communication, along the lines proposed by Heim [21]. The theory takes as central the idea that

speaker and hearer share some information state, call it c, which constitutes their common knowledge. The meaning of a sentence ϕ, $[\phi]$, is an instruction to update the context so that it includes only ϕ-worlds. This instruction is ϕ's so-called context change potential (CCP). We can define CCPs recursively for arbitrarily complex constructions. We stick to connectives here:

Definition 1 (Recursive Definition of CCPs)   *1. $c[\neg\phi] = c - c[\phi]$*

2. *$c[\phi \wedge \psi] = c[\phi][\psi]$*

3. *$c[\phi \vee \psi] = c[\phi] \cup c[\psi]$*

4. *$c[\textit{if } \phi, \textit{ then } \psi] = c - (c[\phi] - c[\phi][\psi])$*

In the hands of this framework, assertion of a complex sentence ξ results in the execution of a complex instruction over an information state, the context c. Suppose ξ has structural description $[_S[_S\phi_1]\ldots[_S\phi_k]]$. The CCP of ξ is a complex instruction which contains within it instructions to execute the CCPs $[\phi_i]$ of sentences ϕ_i embedded in ξ in their corresponding local contexts. Given that the application of $[\phi_i]$ is, in the general case, monotone increasing in information, each execution of $[\phi_i]$ encoded in the CCP of ξ will operate on some subset c' of c. Call this subset c' the *local context for ϕ_i*.[7] For instance, the local context for $[\psi]$ in clause 2 of Definition 1 is $c' = c[\phi]$, and the local context for $[\psi]$ in clause 3 is $c' = c$. If we then view each execution of $[\phi_i]$ in context $c' \subset c$ as a local assertion, then the assertion of any complex sentence can be viewed in general as a bunch of local assertions in local contexts, perhaps with set-theoretic operations such as set union or subtraction operating on the outputs of these local assertions. If this step is made, it is natural to look for constraints on local assertions, the way we might look for constraints on global assertions.

Two constraints on speech acts seem very natural. First, one should not be vacuous, i.e. if the point of speech is to impart information, to discriminate between the ways things could be, then one's speech act should put a dividing line between the live possibilities. In other words, we should require that $c[\phi] \neq c$. Second, towards the same goal, we should not speak falsely. In other words, we should require that $c[\phi] \neq \emptyset$. These constraints are of course old Stalnakerian themes, and they strike us as fairly natural and in no need of justification. Indeed, something like them is standardly assumed in all pragmatic work.[8] Following more algorithmic approaches to discourse (eg. van der Sandt [27], Geurts [13]),[9] the step I would like to make here is to say that what is so natural when applied at the level of the (global) speech act should actually be

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[7]For a more general definition of local context, see Singh [30].

[8]Philippe Schlenker [28, 29] has recently used something like the informativity constraint to develop a pragmatic theory of presupposition projection. The relation between that work and my own will be investigated in future work.

[9]See also lecture notes of Kai von Fintel's [8]for a similar thought.

taken to apply locally, at each local assertion.[10] Thus, we will assume that our context change potentials are subject to the following constraints:

Definition 2 (Constraints on Update) *Let ϕ be a sentence uttered in context c. For all sentences ψ embedded in ϕ, if c' is the local context for $[\psi]$, the following conditions must be met: (i) $c'[\psi] \neq c'$, (ii) $c'[\psi] \neq \emptyset$. The sentence will be judged infelicitous if either (i) or (ii) is violated.*

As opposed to the knowledge norm, this is a constraint on the formal semantics of the update operation. What we are doing is reminiscent of the more general move made in dynamic semantics to turn certain global pragmatic constraints on assertions into local semantic constraints on information update, such as with presupposition. This is no accident. Including presuppositional requirements, we can formulate a quite general notion of when a context "admits" a sentence:

Definition 3 (Admittance) *A context c admits a sentence ψ just in case: (i) $[\psi]$ is defined on c, (ii) $c[\psi] \neq c$, and (iii) $c[\psi] \neq \emptyset$. A context c admits a complex sentence ϕ just in case the local context for each sentence ψ embedded in ϕ admits ψ.*

Definition 4 (Definedness of Update) *If ψ presupposes X, $[\psi]$ is defined on c iff c entails X, i.e. $c[X] = c$. When ψ is non-presuppositional, $[\psi]$ is defined on all contexts.*

Given this contraint system, we can derive the following result:

Main Result Let ϕ be a sentence, and c a context. ϕ is assertable in c only if c admits ϕ.

For some of the absurd assertions ϕ, such as those in (8) and (11), we can prove something even stronger:

Sronger Result There is no context c that admits ϕ. Hence, those sentences are never assertable.

It might be worth examining particular cases in some depth to see why the results hold. Consider, eg. the case we began with. Why can a single agent not utter (3) in context $c = \{A, B, C\}$? The CCP of (3) will look like:

15. c[If not C, then B][If not C, then A]

Consider the execution of [If not C, then B] on c. This results in context $\{C, B\}$. Call this new context c'. This will be the local context for [If not C, then A]. By the definition of CCPs:

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[10] We will see in Section 2.3 that these constraints are actually more robust when applied locally than globally.

16. c'[If not C, then A] = c' - (c'[not C] - c'[not C][A]) = c' - ((c' - c'[C]) - ((c' - c'[C])[A]))

What is crucial to note here is that the local context for application of $[A]$ is c' - c'[C], which is just $\{B\}$. Thus, $(c' - c'[C])[A] = \{B\}[A] = \emptyset$. Hence, we run into a violation of the third admittance condition, from which it follows that c does not admit (3).

Note that it is not the case that (3) can never be appropriately asserted, i.e. (3) does not fall under our "strong result." It is just that it can't be asserted in this particular context. We in fact predict that the sentence should become improved if it is compatible with what we know that more than one person was involved in the murder.[11] This is indeed what we find:[12]

17. If C wasn't involved in the murder, B was. In fact, if C wasn't involved in the murder, A must have been involved in the murder too.

This is an example of a sentence that falls under our main result, but not our strong result. The context-dependent paradoxes of material implication (9-10, 12-13) also fall under this category. Sentence (11) is infelicitous no matter what the context. Note that (9) and (10) can also be made context-independent paradoxes by simply conjoining the conditional with *A did it*, as in (eg.) *A did it and if A didn't do it, B did.* These context-independent paradoxes, and the case of the breakdown of the or-to-if inference (8), are cases that fall under our strong result, i.e. they are never assertable. I will discuss (8) in Section 2.4, for it raises some interesting issues concerning the violability of these constraints, and potential repair processes in the face of violation. But before turning to such concerns, let me briefly turn to the issue of local versus global application of these constraints.

2.3   Local Versus Global Constraints

The formal update of c with sentence (3) does not lead to vacuity or inconsistency globally. Indeed, c[If not C, then B][If not C, then A] = $c* = \{C\}$. Thus, non-trivial information exchange does go on here, globally. The difficulty arises, of course, because one hits local inconsistency in getting from c to $c*$. It seems to hold quite generally that local violations are treated more harshly than global ones. For instance, we can find sentences and contexts where locally, constraints (i)-(iii) are satisfied, but globally, you violate informativity. In such cases, it turns out that we don't judge the assertions to be obviously absurd. In fact, it takes a moment to realize you've been somehow misled. Consider the following:

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[11]The first sentence simply eliminates worlds where it's not the case that neither C nor B did it. Thus, it says that if C didn't do it, B, plus perhaps some others, had to have done it. Then, in the second conjunct, it is perfectly compatible with C not having done it, and B having done it, that someone else, like A, was also involved.

[12]I have changed the wording from "X did it" to "X was involved in the murder," only to remove complications from the uniqueness that seems to be imposed from "X did it." The Gibbard phenomena can be rephrased in these terms without difficulty.

18. A: Which of John and Mary came to the party?
    B: Either John or Mary or both or neither.

Here, each disjunct is read exclusively by the generation of local implicatures.[13] Thus, although no information is conveyed by the complex disjunction, locally everything seems fine, and there is no immediate absurdity to the sentence. I believe this is because the admittance conditions (i)-(iii) are everywhere satisfied.

Globally uninformative sentences in general can sometime serve some purpose. Bob Stalnaker pointed out to me (p.c.) that one can say something like:

19. Look, either A did it or he didn't. Either way, you're going to be the one who gets arrested.

The first sentence, *either A did it or he didn't*, is entirely vacuous. But it serves some rhetorical purpose, and one seems to get away with it. What I would like to point out is that one cannot say such a thing if it is already common knowledge that A did it. The difference between the two cases is that you violate both local informativity and local consistency when it is common knowledge that A did it, and you violate nothing (locally) when you are ignorant about whether or not A did it. Thus, in some sense, it seems local violations are treated less charitably than global violations of informativity, consistency, etc. I will discuss the issue of violability in the next section, but I would like to point to further evidence suggesting the extreme locality of the application of the constraints.

Consider embedding under quantifiers, where presumably no pragmatic act of assertion is taking place. We see that the constraints apply in such positions as well:[14]

20. Every man who is a bachelor will come to the party.

21. #Every bachelor who is a man will come to the party.

In a dynamic semantic system, such as Heim [19, 20, 21], (20) and (21) would be paired with logical forms:

22. Every x_i, x_i a man, x_i a bachelor, x_i will come to the party

23. Every x_i, x_i a bachelor, x_i a man, x_i will come to the party

Dynamic interpretation of LF (23) runs into a local violation of informativity, whereas interpretation of (22) faces no such difficulty. In a static semantics (eg. Heim and Kratzer [22]), both (20) and (21) receive the interpretation that 'every bachelor came to the party.' It seems to be impossible to even state such local

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[13]For evidence supporting local implicatures, see Levinson [25], Chierchia [5], Fox [11, 10], Chierchia, Fox, and Spector [12], Geurts [14], Singh [31].

[14]Irene Heim (p.c.) independently suggested to me an example very much like this one making the same point.

constraints within that kind of semantic system. There may be a way to impose this constraint within the pragmatics, but since this is below the speech act level, it is not clear to me how one might do so. The only way I can see of capturing this asymmetry would be to write into the semantics of relative clauses that they must be non-redundant. That seems plausible, but the benefit of dealing with this dynamically is that the redundancy constraint generalizes to many constructions.

2.4   Inviolability and Repair

I am formulating the admittance constraints as inviolable. If that is so, what are we to make of presupposition accommodation? Presupposition accommodation is made, of course, in response to the threat of update being undefined. If some repair isn't made, communication will crash. Thus, the definedness constraint is inviolable, but you have a chance to fix things before executing the update. But if you can rescue potential violations of definedness, why can't you rescue potential violations of local informativity/consistency? I will answer this question in a moment, but first, let us examine the breakdown of the or-to-if inference we alluded to earlier. I repeat the examples here:

24. Either the bathroom is upstairs or there is no bathroom in the house

25. #If the bathroom is not upstairs, there is no bathroom in the house

    The CCPs corresponding to these sentences look like:

26. c[the bathroom is upstairs] $\cup$ c[there is no bathroom in the house]

27. $c-((c-c$[the bathroom is upstairs]) - (($c-c$[the bathroom is upstairs])[there is no bathroom in the house]))

    Consider (24) first. Since it is felicitous, some context must admit it. What kind of a context can this be? If c entailed that there is a bathroom in the house, there would be a violation of local consistency in the second disjunct. This would prevent one from asserting (24) in such a context. On the other hand, if the context entailed that there is no bathroom in the house, there would be a violation of local informativity in the second disjunct and a violation of local definedness in the first disjunct. A simple repair process would solve both violations in each case. For instance, consider a context that entails that there is no bathroom in the house. A possible repair would be to globally add worlds to c where there is a bathroom in the house, creating a new global context $c' = c \cup s$, where s is some reasonable subset of worlds where there is a bathroom in the house. Once this has been done, one could execute the CCP of (24) on c' instead of on c:

28. c'[the bathroom is upstairs] $\cup$ c'[there is no bathroom in the house]

Now, given the option of local accommodation[15] of there being a bathroom at the first disjunct, the definedness requirement would be satisfied there, and the second disjunct would now be locally informative with respect to c'. This is what the overall update would look like:

29. c'[there is a bathroom in the house][the bathroom is upstairs] $\cup$ c'[there is no bathroom in the house]

Given the option of local accommodation, if non-monotone repairs were allowed, nothing would go wrong with the above strategy. However, we know that (24) is unassertable when it is common knowledge that there is no bathroom in the house, and it certainly cannot get you to now think it possible that there is a bathroom in the house, which is upstairs.[16] Since such a context does not admit (24), it suggests that non-monotonic repairs are disallowed; the only way to repair a context is by adding information, not removing information:

Monotone Repair The only way to repair a context is by adding information to it, never by retracting information.

Given the above discussion, the only kind of context that can admit (24) is one that contains both bathroom-worlds and non-bathroom-worlds. And this kind of context intuitively seems to be the only kind of context in which one can felicitously assert (24). But note that in such a context, update with the first disjunct would violate the definedness condition. We have in place two possible repairs, global accommodation of bathroom-worlds or local accommodation of bathroom worlds. Let $c' = c$[there is a bathroom in the house]. Then the two possibilities are:

30. Global Accommodation: c'[the bathroom is upstairs] $\cup$ c'[there is no bathroom in the house]

31. Local Accommodation: c'[the bathroom is upstairs] $\cup$ c[there is no bathroom in the house]

The global accommodation option is not available because c' does not admit the second disjunct (due to local inconsistency). Thus, the only possible repair is local accommodation of bathroom-worlds in the first disjunct. The admittance of the sentence is thereby predicted.

Let us turn now to (25), and its corresponding CCP in (27). A context with only non-bathroom worlds will not admit the antecedent (due to a violation of local definedness, along with the constraint against non-monotonic information update). A context with only bathroom worlds will not admit the consequent (due to a violation of local consistency and the constraint against non-montonic information update). Thus, the only candidate context is one

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[15]cf. Heim [21].

[16]The same goes, mutatis mutandis, for contexts which entail that there is a bathroom in the house.

with both bathroom-worlds and non-bathroom worlds. Call such a context c. The only way for c to admit the antecedent is, of course, to accommodate that there is a bathroom, i.e. convert c to $c' = c$[there is a bathroom in the house]. By the preference for global over local accommodation, update with the consequent [there is no bathroom] would lead to a violation of local consistency.[17] Thus, as opposed to the disjunction case, no context can admit this conditional, hence its infelicity.

I should add that there is, formally speaking, one potential escape hatch from this conclusion. If there were purely local accommodation of there being a bathroom, there would not necessarily be a consistency violation.[18] As far as I can tell, the only way negated sentences allow local accommodation is with marked intonation. In this regard, they seem to differ from disjunctions. The following sentence, for example, simply doesn't allow for a local accommodation interpretation without reading the negation as metalinguistic:

32. The king of Elbonia isn't bald

33. = there is a king of Elbonia and he isn't bald

34. ≠ either there is no king of Elbonia or there is and he is bald

This is why the following discourse is infelicitous:

35. A: The kind of Elbonia isn't bald.
    B: Oh really? I wonder if the queen of England would find him attractive.
    A: # Hey wait a minute! How do you know there even IS a king of Elbonia?

Thus, assuming that local accommodation under negation only arises with metalinguistic intonation, we actually predict that that is the only way to save the sentence here. The marked intonation does indeed seem to improve the sentence:

36. If the bathroom isn't UPSTAIRS, then there IS no bathroom in the house

Finally, a word about repairs. Why can we only rescue ourselves from violations of definedness? In other words, why is presupposition accommodation an object of study, and not, say, consistency accommodation, or informativity accommodation? The answer to our question rests in the fact that the only repairs that are allowed are monotone increasing in contextual information. You can only repair by adding information, never by retracting it. Given the impossibility of non-monotonic repairs, it is easy to show that:

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[17] The CCP after global accommodation would be: $c' - ((c' - c'$[the bathroom is upstairs]) - $((c' - c'$[the bathroom is upstairs])[there is no bathroom in the house])).

[18] Local accommodation would look like: $c - ((c - c'$[the bathroom is upstairs]) - $((c - c'$[the bathroom is upstairs])[there is no bathroom in the house])). The reading this would generate is: either there is a bathroom in the house and it's upstairs, or there is no bathroom in the house.

- If $c[\phi]$ is not defined and c is consistent with the presupposition of ϕ, then there exists $c' \subset c$ such that $c'[\phi]$ is defined (i.e. a monotonically altered context can be found which will satisfy the definedness condition)

- If $c[\phi] = \emptyset$, then for all $c' \subset c$, $c'[\phi] = \emptyset$ (i.e. no monotonically altered context will satisfy the consistency condition)

- If $c[\phi] = c$, then for all $c' \subset c$, $c'[\phi] = c'$ (i.e. no monotonically altered context can be found which will satisfy the informativity condition)

Thus, only definedness violations can be repaired by adding information. We must also be careful in stating how general the claim is meant to be. Depending on the semantics one assigns to epistemic modal sentences, the third bullet point does not hold if we take $\phi = \diamond\psi$ (van Benthem [3]). We will not take a stance on the correct semantics for epistemic modal sentences here. Nevertheless, in the next section we shall use our intuitions about what information they convey to highlight a further constraint on information flow in discourse.

3   Beyond Moore and Beyond Admittance

Recall the standard Moore's paradox that we looked at in Section 1:

37. #It is raining and I don't know that it is raining

The explanation we would give is that, by the time the first sentence has been interpreted in context c it is common knowledge between speaker and hearer that it is raining. Call this new context c'. It follows from c' that the speaker knows that it is raining. Hence, updating c' with the second sentence results in the empty set, in which case c does not admit (37).[19] That it is raining is common knowledge among some set of agents is crucial to the paradox. For instance, suppose John and Mary are participants in a conversation, and John says:

38. It is raining...(pause) and he doesn't know it (pointing at Bill)

Such a sentence is fine so long as Bill is not a part of the conversation. For then it is common knowledge only among John and Mary that it is raining. As soon as Bill becomes a party to the conversation, such a sentence cannot be felicitously uttered, for it will be common knowledge among John, Mary, and Bill that it is raining, in which case updating with the second conjunct will lead to inconsistency.

Be that as it may, why is the following sentence infelicitous?

39. #It might be raining and it is raining

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[19]Thus, our account of this kind of infelicity agrees with Gillies [16] that this is odd because of inconsistency. But Gillies' account will not generalize to all the cases we consider below.

There is no formal inconsistency between the first and second sentence, nor is there any redundancy, nor is there any presupposition failure. What is wrong with it? I would like to propose that what is wrong with it is that the second sentence conflicts with an ignorance inference generated by the first sentence, and that this is the source of the infelicity. When one hears the sentence *it might be raining*, one infers that the speaker does not know whether or not it is raining. The second sentence then puts forth the information that the speaker does know that it is raining, and this creates a peculiar kind of infelicity.[20]

But why should this infelicity arise? The hallmark of implicatures and ignorance inferences (which I will simply call 'implicatures', though see Fox [10] for crucial differences between the two notions) is that they are cancellable:

40. John ate some of the cookies. In fact, he ate all of them.

41. John might have a son. In fact, he DOES have a son.

42. At least three men who work for Company X are married. In fact, all of them are.

The generalization seems to be that one can cancel an implicature only if one explicitly signals that one's earlier speech act was somehow misleading:

Explicit Signalling As a cooperative speaker, if by use of a sentence you have conveyed to your interlocutor that you do not know ψ, and you actually do, then it is your duty to ensure that you explicitly cancel this inference, and signal (say by use of a discourse particle) that that is the function of the coming assertion.

The fact that this is done in (40)-(42), and is not done in (39), will account for the difference in felicity between them. For instance, if we try (40)-(42) again without the particle there to signal the cancellation, the result is rather odd:

43. #John ate some of the cookies and he ate all of them.

44. #John might have a son and he DOES have a son.

45. #At least three men who work for Company X are married and all of them are.

Note that the infelicity is really related to implicature cancellation, and not just the fact that the second sentence is logically stronger than the first:

46. John walks and he walks quickly at that!

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[20]Recent work by Giorgio Magri shows that when implicatures contradict world-knowledge, the sentence tends to create oddness. It would be good to examine the extent to which the two ideas are related.

47. John bought a dog and the dog he bought was a German Shepherd.[21]

One final note about what it means to 'explicitly signal' the cancellation. There are two components. First, there must be an overt marker, like a discourse particle, to signal that one was misleading in one's earlier assertion. Second, it is the asserted content of the next assertion which should cancel the ignorance inference. It seems that one cannot cancel an implicature by forcing the hearer to accommodate a presupposition:

48. At least three men who work for Company X are married. In fact, all of them are.

49. #At least three men who work for Company X are married. In fact, every man who works for Company X loves his wife

50. John might have a son. In fact, he DOES have a son.

51. #John might have a son. In fact, I saw his son at Harvest Co-op the other day.

The second sentence of (49) presupposes that every man who works for Company X is married. That the speaker knows this conflicts with the implicature generated in the first sentence. One cannot cancel implicatures in this way. Similarly, in (51), the presupposition that John has a son, if accommodated, would lead it to be common knowledge that John has a son, which would cancel the implicature in the first sentence that the speaker doesn't know that John has a son. Without explicit signalling of a particular kind, one cannot get away with such a sequence of assertions.[22]

Note that in both cases, the sentence that cancels the implicature asymmetrically entails the negation of the implication. For instance, *every man who works for Company X loves his wife* asymmetrically entails that every man who works for Company X is married. Thus, one might think that if $\neg\Box_S\phi$[23] is the implicature generated by the earlier sentence, one can only use a sentence ϕ to cancel the implicature generated by the earlier sentence, the assertion of which leads to the inference that $\Box_S\phi$. Using a sentence ψ that asymmetrically entails ϕ will be ruled out. But the following suggests that this constraint cannot be right:

52. At least three men who work for Company X are married. In fact, all of them are happily married.

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[21]Note that this has the further implication that infelicity cannot be due to general maxim of manner reasoning. For instance, the fact that one could have uttered *John bought a German Shepherd* to convey the information in (47) is not enough to block one from uttering (47).

[22]Note, as per our discussion of local accommodation and negation, that the following sentence is odd: #*John might have a son. In fact, I didn't see his son at Harvest Co-op the other day.* The reason seems to be that local accommodation is not permitted, and hence the presupposition that John has a son is globally accommodated, which clashes with the implicature generated in the first sentence.

[23]I use $\Box_S\phi$ to mean 'the speaker knows that ϕ.'

Here is the final version of the constraint:

Explicit Signalling As a cooperative speaker, if by use of a sentence you have conveyed some information $\neg\Box_S\psi$ or $\Box_S\neg\psi$ to your interlocutor, then it is your duty to ensure that you explicitly cancel this inference by following up with a sentence ϕ which contains an explicit corrective marker and whose asserted content is such that $\Box_S\phi$ entails the negation of the implicature you are meant to be cancelling.

I merely state this constraint here, without attempting to derive it from more basic principles of cooperative communication. However, having stated it, and having seen how it follows from this that it is not possible to cancel implicatures through presupposition accommodation, we can use this constraint to actually do empirical work for us. For instance, the complex issue of what the presuppositions of quantified sentences are has notoriously been difficult to pin down. Part of the difficulty seems to be a difficulty in data collection, for many intervening factors distort one's judgments about what projects. I think this constraint can give us a firm diagnostic with which to test the presuppositions of quantified sentences. For instance, if the constraint is right, then it follows that a sentence like *No man who works for Company X loves his wife* does not, contra Heim [21], presuppose that every man who works for Company X is married:

53. At least three men who work for Company X are married. In fact/moreover, no man who works for Company X loves his wife.

Further discussion would take us too far from the purpose of this paper, so I will end here.[24]

4 Concluding Remarks

Why do truth-value judgments so often fail? What are such intuitions about, anyway? I believe that what we have intuitions about are ideal conversations, and that our theories should be theories of these ideal conversations.[25] I have tried to characterize to some extent what such a theory should look like. It will be one where speakers and hearers share some information, and use sentences of their language to update that information. However, they are not free to say and do as they please: their assertions are governed by inviolable constraints, both semantic and pragmatic. I have enumerated some of them here: the admittance conditions, the knowledge norm, explicit signalling. Undoubtedly there will be

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[24]The possibility of local accommodation, where the reading would be 'no man who works for Company X is married and loves his wife,' tempers the force of this claim. For the claim to go through, I must show that local accommodation is not possible here. For detailed discussion of presupposition in quantified sentences, see Karttunen and Peters [24], Heim [21], van der Sandt [27], Geurts and van der Sandt [15], Beaver [1, 2], von Fintel [7, 9], Schlenker [28, 29], Chemla [4].

[25]I thank Danny Fox for helpful discussion on this methodological point.

more. We seem to be much better equipped to answer the question *under such and such conditions, can you assert this sentence?* than the question *under such and such conditions, is this sentence true?*

Wittgenstein thought that an explanation of the absurdity generated by Moore's Paradox would reveal "something about the logic of assertion."[26] Groenendijk and Stokhof [18] also used Moore's Paradox type sentences to probe constraints on assertion. They developed in tandem with a theory of semantics of the conventional sort a theory of correctness conditions on assertion. I have tried to generalize this intuition to many absurd assertions beyond the Moore's Paradox type. I believe they reveal the logic of assertion to be well-captured in a semantics defined by instructions for updating contexts. In addition, with such a theory in hand the notion of truth itself can be derived from the theory of information dynamics: ϕ is true in context c iff $c[\phi] = c$.[27] Thus, unlike other attempts to render assertability as a more fundamental notion than truth, we don't lose the capacity to derive truth-conditions for arbitrarily complex sentences. I think absurd assertions teach us that characterizing the logic of assertion is a task that should be taken seriously, and that such a characterization will be best captured within a semantic framework that allows access to local contexts, and puts constraints on local assertions. But I haven't of course met the burden of proof that this claim entails, especially given that I make wrong predictions in certain basic cases. For instance, with no further assumptions about conditionals/knowledge attribution sentences, I predict that the following should be infelicitous, while they obviously are not:

54. If it is raining and I don't know it, then I'll get soaking wet out there.

55. Suppose it is raining and I don't know it; I'll get soaking wet out there.

56. If Mary is cheating on me, then I don't know it.

The latter is particularly interesting, because I predict the observation made in Groenendijk and Stokhof [18] that one should never be able to say something like:

57. #I don't know that Mary is cheating on me.

(57) presupposes that Mary is cheating on the speaker. Once this is accepted, it becomes common knowledge that Mary is cheating on the speaker. But then the asserted content contradicts this common knowledge, so I predict that no context should ever admit such a sentence. As a stand alone sentence, this prediction seems correct. But when the presupposition is satisfied in the antecedent of an if-clause, it all of a sudden becomes felicitous.

Kai von Fintel (p.c.) points out to me that Moore's type paradoxes break down not just in the antecedents of conditionals, but in other non-assertive contexts as well:

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[26]Wittgenstein [35], p.177.
[27]See eg. Heim [21], van Benthem [3].

58. Either it's raining and I don't know it or someone's playing a trick on me.

I leave these as puzzles for now.

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