

Uniformity Motivated
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Abstract

Can rational communication proceed when interlocutors are uncertain which contents utterances contribute to discourse? An influential negative answer to this question is embodied in the Stalnakerian *principle of uniformity*, which requires speakers to produce only utterances that express the same content in every possibility treated as live for the purposes of the conversation. The principle of uniformity enjoys considerable intuitive plausibility and, moreover, seems to follow from platitudes about assertion; nevertheless, it has recently proven controversial. In what follows, I defend the principle by developing two arguments for it based on premises reflecting the central aims and assumptions of *possibility-carving frameworks* for modeling inquiry — that is, frameworks which describe the evolution of individuals' attitudinal states in terms of set-theoretic operations defined over a domain of objects representing possibilities.

1 Introduction

Consider the following two claims about assertion:¹

(Assertion Rule) If accepted, an assertoric utterance changes the context by adding its content to the common ground.

(Uniformity) In cases of rational communication, an assertoric utterance expresses the same proposition in each possible world in the context set.

(Assertion Rule) renders formally tractable the platitude that assertion is a species of literal linguistic communication: a speaker asserts a content, and, if all goes according to plan, her audience comes to take that same content for granted for the purposes of the conversation. What is more, it is tempting to think that (Uniformity) follows from (Assertion Rule). For, temptation suggests, if (Uniformity) were violated, interlocutors would not know how to apply (Assertion Rule). Stalnaker (2009) has this sort of argument in mind when he writes:

¹See e.g. Stalnaker 1978, 2009, 2014.

“...an assertion is a move in conversational game with a rule that says how the context evolves. To allow assertions with content to which the players of the game do not have access is [to] allow a situation in which the players will be unable to apply the rule. It would be like a card game in which [you are] dealt a card, face down, and the rule requires that you draw another card if and only if the card you were dealt is red. If you are not allowed to look at the card you are dealt, then you [are] not in a position to apply the rule.” (Stalnaker 2009, 407)

If (Uniformity) follows from (Assertion Rule), and if (Assertion Rule) approximates the status of a platitude about assertion, then there is a strong case to be made for (Uniformity). But, tempting though it may be, the inference from (Assertion Rule) to (Uniformity) is controversial. Why think that violations of (Uniformity) *must* put interlocutors in a position from which they are unable to apply (Assertion Rule)? Hawthorne and Magidor (2009, 2011), for example, have argued that if individuals can sometimes come to be belief-related to a content by accepting a sentence that expresses it, then interlocutors can sometimes update the common ground with the content expressed by an assertion even in cases of (Uniformity) violation. To the extent that this is a reasonable account of what it takes to come to believe a content, there is reason to doubt that cases in which (Uniformity) is violated are ipso facto cases in which interlocutors cannot apply (Assertion Rule), and so reason to doubt (Uniformity) itself.

The friend of (Uniformity) must therefore confront the question of whether it is possible to construct an argument for her thesis from more compelling premises. An appealing way to begin addressing this question is to characterize the class of models of assertion in inquiry within which a convincing argument for (Uniformity) can be constructed. If some such models are explanatorily successful, their success constitutes a non-question-begging argument for (Uniformity). In what follows, I pursue this strategy by showing how certain general assumptions about how assertion is to be modeled can serve as the basis for two arguments for (Uniformity). In so doing, I demonstrate that one can argue persuasively for (Uniformity) without appealing to a controversial theory of belief.

Dialectically, my project combines concessiveness towards an initial skepticism about (Uniformity) with a robust defense of it as a constraint on rational communication. I will not dispute that, according to some ways of thinking about belief, there is no important connection between (Assertion Rule) and (Uniformity). Instead, I will show that if one wishes to develop a theory on which the common ground of a conversation plays a certain kind of explanatory role, one ought to accept (Uniformity) if one accepts (Assertion Rule). To this end, I will help myself to a number of premises which proponents of alternative frameworks might reject but which, unlike the claim about ability required by Stalnaker’s argument, capture basic facts about the explanatory aims of the Stalnakerian framework.

The interest of this project of showing explicitly and formally why anyone with certain natural theoretical commitments ought to embrace the connection between (Assertion Rule) and (Uniformity) is acknowledged, at least implicitly, by both Stalnakerians and their critics. Hawthorne and Magidor (2009, 395), for example, present a brief, informal argument similar to part of the first argument I develop below. Stalnaker (2009) seems

to be gesturing toward the possibility of constructing such an argument when he writes that Hawthorne and Magidor’s model of coming to believe a content “does not take [his] model of discourse seriously” (2009, 408), and Almotahari and Glick (2010) make a similar point when they worry that that model “sever[s] the connection between communication theory and the theory of action” (2010, 1085). Yet no one, Stalnakerian or otherwise, has seriously attempted to carry the project to completion.

The remainder of this article is organized into five sections. In the first, I review the details of Stalnaker’s framework for modeling inquiry and present a formal reconstruction of his argument for (Uniformity) and of Hawthorne and Magidor’s criticism of that argument. In the second, I describe the motivations for my methodological assumptions and introduce an ancillary premise which will be invoked in later arguments. In the third and fourth, I present my two arguments for (Uniformity). In the fifth and final section, I argue that the second of these suggests a way for the Stalnakerian to respond to Hawthorne and Magidor’s (2009) argument that (Uniformity) is sometimes violated.

2 From (Assertion Rule) to (Uniformity)

Stalnaker’s work on assertion in inquiry stands within an influential tradition in the study of content-bearing mental states, which models the contents of those states as sets of entities (*points*): each point represents a distinct possibility, and each set of points represents the content that is compatible with all and only those possibilities which correspond to its members.² Such *possibility-carving frameworks* are useful in that they permit facts about changes in individuals’ attitudinal states to be described set-theoretically, leading to particularly elegant characterizations of processes like inquiry, hypothetical reasoning, and plan formation.

In the Stalnakerian framework, every conversation is associated with a set of *participants* or *interlocutors*. These interlocutors perform assertoric speech acts, which are governed by conversational rules. It will be helpful to separate out two aspects of each such speech act: the *sentence* assertorically uttered and the *content* (set of points) asserted. The same sentence, uttered assertively, can constitute the assertion of different contents in different contexts.

Central to the Stalnakerian framework is the notion of *presupposition*. Presupposition is a theoretically primitive attitude interlocutors bear to sets of points; an interlocutor presupposes a content just in case she takes it for granted for the purposes of the conversation.³ The set of contents presupposed by every interlocutor in conversation c at point w is the *common ground* in c at w (henceforth CG_w^c); the set-theoretic intersection of these contents is the *context set* of c at w (henceforth CS_w^c). CS_w^c thus represents the set of possibilities treated as live for the purposes of the conversation. For the sake of simplicity, I will assume that all interlocutors in a given conversation presuppose the

²I refer to *contents* rather than *propositions* throughout so as not to suggest that I take the possibilities represented by points to be metaphysically possible worlds. In the interest of maximal generality, this is an issue on which I wish to avoid taking a stand.

³Stalnaker (1978, 84) clarifies that this requires taking for granted that her interlocutors also take the content for granted for the purposes of the conversation.

same contents, so that the common ground of the conversation can be identified with the presuppositions of any interlocutor.⁴

I will primarily be concerned in what follows with interactions between the contents of assertions and the context sets of the conversations in which they are performed. Let us call the set of points formed by intersecting the context set of conversation c at point w with the content of an assertoric utterance u at point w' the CS_w^c -content of u at w' (when the values of c and w are not important, we can also speak of *CS-content* more generally). Since the context set plays a distinctive role in Stalnaker's theory of inquiry, failures of (Uniformity) which involve CS-content are especially problematic. Indeed, in what follows I will restrict my attention to a version of the uniformity principle which concerns CS-content exclusively.⁵

Having introduced these Stalnakerian concepts, we can now give a formal characterization of the uniformity principle which makes precise the sense in which it is concerned with the CS-content of an utterance:

(Uniformity) In cases of rational communication: for all conversations c , assertoric utterances u , contents p , and points w, w', w'' : if w' is in CS_w^c and p is the CS_w^c -content of u in w' , then for all w'' : if w'' is in CS_w^c , then p is the CS_w^c -content of u in w'' .

As we have seen, Stalnaker's argument from (Assertion Rule) to (Uniformity) relies on motivating an intuition to the effect that in cases where (Uniformity) is violated, interlocutors are not in a position to add the content of an assertion to the common ground. We can render this claim explicit as follows:

(Stuck) For all conversations c , assertoric utterances u , contents p , and points w, w', w'' : if w' is in CS_w^c and p is the CS_w^c -content of u in w' , and there is some w'' such that w'' is in CS_w^c and the CS_w^c -content of u in w'' is not p , then some interlocutor in c is not in a position at w to apply (Assertion Rule) to CG_w^c in response to u .

Stalnaker's argument also requires a principle linking what counts as rational communication on the part of a speaker with the abilities of her audience. The intuitive idea is that a speaker ought not to assert if her audience cannot respond appropriately:

(Fair Play) In cases of rational communication: for all interlocutors s , conversations c , assertive utterances u , and points w : s performs u at w only if every interlocutor in c is in a position at w to apply (Assertion Rule) to CG_w^c in response to u .

⁴This exposition follows Stalnaker 1978. Stalnaker 2014 defines the notions of presupposition and common ground in terms of an iterated and collectivized notion of *acceptance for the purposes of the conversation* (2014, 25; 2014, 4). The resulting conception of the common ground is so stringent that it is not clear whether any nontrivial content meets its requirements, and, as it is not required for my arguments below, I will set it aside.

⁵Hawthorne and Magidor (2009, 384) call this version of the principle (*Weak Uniformity*) and note that there is textual evidence that Stalnaker prefers it to the unrestricted version of the principle.

(Stuck) and (Fair Play) together secure the truth of (Uniformity).

Consider now the following scenario, a version of which is discussed by Hawthorne and Magidor and which provides a good illustration of the intuition behind Stalnaker's argument:

FIRE: Smith is watching Jones through a doorway. She can see the corridor in which Jones is standing, but not the room into which Jones is looking, though she presupposes, and Jones presupposes that she presupposes (and so forth), that the room contains either Bill or Ben and no one else. Bill or Ben (whoever it is) is performing a dangerous chemical experiment. Something goes horribly awry, and Jones turns to Smith and exclaims 'He is on fire!'.

Let us refer to the point representing the situation described in FIRE as w and the conversation between Smith and Jones as c . Since Smith does not know whether the referent of Jones's 'he' is Bill or Ben, there are distinct points w', w'' in CS_w^c immediately after Jones's utterance u such that in w' Jones refers to Bill and in w'' Jones refers to Ben. Suppose that in w' , u expresses a content which is true just in case Bill is on fire, and that, in w'' , u expresses a content which is true just in case Ben is on fire. Because CS_w^c contains both points at which Bill but not Ben is on fire and points at which Ben but not Bill is on fire, the CS_w^c -content of u at w' is different from its CS_w^c -content at w'' . By (Stuck), then, some interlocutor (here, Smith) is not in a position at w to apply (Assertion Rule) to CG_w^c in response to u — which of the two contents of u is she supposed to add to the common ground? It follows, by (Fair Play), that Jones's utterance u does not count as a case of rational communication.⁶

Hawthorne and Magidor (2009, 2011) seek to undermine the inference from (Assertion Rule) to (Uniformity) by rejecting (Stuck). As noted above, they argue that if an individual can come to be belief-related to a content by accepting a sentence that expresses it, then interlocutors can update the common ground with the content expressed by an assertion even in cases of (Uniformity) violation. In the case of FIRE, what this claim amounts to is that Smith is able to apply (Assertion Rule) to the common ground in response to u by accepting the sentence 'He is on fire' and thereby coming to believe its content, whatever that happens to be.

3 Inquiry and Possibility-Carving Methodology

I have promised to derive (Uniformity) from premises reflecting foundational commitments of possibility-carving frameworks. In this section, I clarify the content of two such commitments and introduce an auxiliary principle on which my arguments in later sections will rely.

The first commitment, which is central to the possibility-carving approach and will therefore be assumed without defense in what follows, is that the contents of both

⁶Stalnaker (1978) therefore proposes that speaker and audience perform a process of reinterpretation to recover a uniform content for the utterance.

assertions and content-bearing mental states can be modeled as subsets of a suitably chosen set of points. The second is that there is a tight connection between facts about which possibilities interlocutors rule in and out for the purposes of the conversation and facts about what linguistic actions it is acceptable for them to perform.

This second commitment is both substantive and important to my arguments in what follows, so it is worth discussing its motivation in some detail. The central insight which possibility-carving frameworks are supposed to capture is that when interlocutors engage in inquiry, their aim is to coordinate on an ever-more-precise conception of the world. Because the context set represents interlocutors' shared conception of the world, there must be a tight connection between what is ruled in or out for the purposes of a conversation and what constitutes reasonable linguistic behavior for its interlocutors. Thus Stalnaker:

“One cannot normally assert, command, promise, or even conjecture what is inconsistent with what is presupposed. Neither can one assert, command, promise or conjecture what is itself presupposed. There is no point in expressing a proposition unless it distinguishes among the possible worlds which are considered live options in the context.” (Stalnaker, 1970, 280)

On the possibility-carving picture, then, the theoretical role of the context set of a conversation is, in part, to encode information about the speech acts which count as intelligible continuations of that conversation. Of the many ways in which the context set constrains acceptable linguistic behavior, I will focus on two — one in each of my arguments for (Uniformity). First, I will rely on the principle that, *ceteris paribus*, it is acceptable for an interlocutor to non-rhetorically ask a polar question ‘Is it the case that ϕ ?’⁷ only if the content expressed by ϕ is neither entailed by nor inconsistent with the common ground. Second, I will rely on the principle that, *ceteris paribus*, it is acceptable for an interlocutor to assert a content just in case doing so would result in narrowing the context set without eliminating it entirely. These principles will be formulated more precisely in the next two sections.

My arguments will also depend on an ancillary premise which ensures that, despite the possibility of violations of (Uniformity), the negation operator behaves as it does in propositional logic — an assertoric utterance of a sentence always expresses the complement of the content expressed by an assertoric utterance of its negation:

(Negation) For any assertoric utterance u of sentence ϕ in conversation c at point w , if u expresses contents p_1, \dots, p_n at different points in CS_w^c , then there is a sentence ‘ $\neg\phi$ ’ such that, for each point w' in CS_w^c : if u expresses p_n at w' , then an assertoric utterance u' of ‘ $\neg\phi$ ’ at w' expresses W/p_n .⁸

Note that (Negation) is plausible only on the assumption that interlocutors are not uncertain about the meaning of ‘ \neg ’. If they were — if, for example, they treated as live

⁷Following Quine 1940, I use ‘ $\dots \mu \dots$ ’ so that it is synonymous with the expression ‘ $\dots \wedge \dots \wedge \mu \wedge \dots$ ’, where ‘ \wedge ’ indicates concatenation.

⁸Here ‘ W ’ denotes the set of all points in the model and ‘ W/p_n ’ denotes the complement of content p_n in that set.

the possibility that ‘ \neg ’ denoted the identity truth function (thus meaning *it is true that* rather than *not*) — then there would be points in the context set of the conversation at which ϕ and $\lceil \neg\phi \rceil$ expressed the same content. I will therefore make this assumption in what follows. Similar considerations require that I assume that interlocutors are not uncertain about the meaning of the interrogative construction ‘Is it the case that ... ?’. The necessity of these assumptions should not be taken to undermine the generality of my arguments, however, for two reasons. First, because ‘ \neg ’ and the English syntax for polar questions are arbitrary means of expressing negation and interrogative force, respectively, my arguments show, by parity of reasoning, that (Uniformity) must be satisfied in any conversation where there is coordination on any syntactic means of expressing negation and interrogative force which allows for the same kinds of syntactic embeddings as English. Second, if an argument for (Uniformity) can be constructed using a group of speakers who presuppose the grammar of some particular language, then there is reason to think that (Uniformity) must be satisfied even when there is uncertainty about the grammar of the language being spoken. (Uniformity) is a general principle of rational communication, and it would be odd for the applicability of a general principle of rational communication to depend on what interlocutors can take for granted about the grammar of their language. In the context of the first of my arguments below, for example, the assumption that interlocutors have coordinated on conventions for expressing negation and polar questions is important only because it allows them to express their uncertainty about certain contents. There is no reason to think that violations of (Uniformity) would not result in the same uncertainty if interlocutors lacked the means to express it. We thus have good reason to endorse the conditional claim that if there is a compelling argument for (Uniformity) when we restrict our attention to conversations in which interlocutors are certain of the meanings of the negation- and question-forming constructions of their language, then there is a compelling argument for (Uniformity) *tout court*.⁹

4 The First Argument

In this section, I present the first of my arguments for (Uniformity). The principal premise on which I will rely explicates the intuitive relationship between what is taken for granted in a conversation and which questions are felicitous continuations of that conversation:

(Correspondence) For any conversation c , sentence ϕ , and point w , if it is acceptable for some interlocutor in c to sincerely and non-rhetorically ask the polar question $\lceil \text{Is it the case that } \phi? \rceil$ at w , then there is a point in CS_w^c which is an element of the content of an assertoric utterance of ϕ at w , and there is a point in CS_w^c which is an element of the content of an assertoric utterance of $\lceil \neg\phi \rceil$ at w .

(Correspondence) enforces a connection between what counts as acceptable linguistic behavior for the participants in an inquiry and the ways in which that inquiry can be

⁹My reliance on (Negation) is thus compatible with the proposal, advanced in section 5 below, that the assertoric content of any utterance is to be identified with its superdiagonal content.

modeled, precluding particular modeling choices which do not respect this connection. For example, as Allan Gibbard (ms) has shown, the kind of permissive view of coming to believe a content which Hawthorne and Magidor suggest leads quickly to the conclusion that inquiry is a trivial enterprise.¹⁰ For it is a feature of the linguistic competence of a normal English speaker that she knows that the sentence ‘The world is like *this*’ expresses a truth as uttered in any context. If accepting a sentence as uttered on a particular occasion is sufficient for ruling out the points incompatible with its content, then one way for conversational participants to narrow the context set to the unique point representing the way things actually are is to utter this sentence, intending with ‘this’ to rigidly designate all that is, and then accept it; the content expressed by ‘The world is like *this*’, uttered with the aforementioned intention, excludes every point except the point representing the world of utterance.

Intuitively, no model which allows speakers to coordinate on a single point so easily could provide insight into inquiry as it actually occurs. (Correspondence) solves this sort of problem, since it ensures that if it is acceptable for interlocutors to sincerely ask a variety of polar questions even after accepting the sentence ‘The world is like *this*’ (as it evidently is), then accepting that sentence must not involve their ruling out all points but one from the context set of the conversation.

My first argument for (Uniformity) requires two additional premises. The first of these guarantees that there are sentences in our language which can be used uniformly to express certain contents:

(Sentential Plenitude) For any conversation c , content p , point w , and assertoric utterance u at w , for each point w' in CS_w^c , if u expresses p at w' , then there is a sentence ψ such that an assertoric utterance u' of ψ at w expresses p at every point in CS_w^c .

The idea behind (Sentential Plenitude) is that, if there is an assertoric utterance which violates (Uniformity), there must also be corresponding assertoric utterances which do not violate (Uniformity) and which express the various contents that could, given the context set, be expressed by the original assertion. This will usually be the case when (Uniformity) is violated because of the use of a context-sensitive expression, for there will usually be context-insensitive expressions which have each of the possible semantic values of the original. For example, in FIRE, Jones’s utterance of ‘He is on fire’ violates (Uniformity) because the context set doesn’t settle whether ‘he’ refers to Ben or to Bill. But corresponding to each possible content of Jones’s utterance is a sentence which, uttered assertively, would satisfy (Uniformity) and express that content: the two relevant sentences are ‘Bill is on fire’ and ‘Ben is on fire’. It is plausible that this phenomenon generalizes to other varieties of context sensitivity. If gradable adjectives, relational predicates with implicit arguments, quantifiers, and modals come along with contextually supplied reference classes, thresholds, restrictor properties, and so forth, then, insofar as these contextually supplied parameters can

¹⁰Gibbard’s argument concerns individual propositional attitudes rather than the context set and attempts to demonstrate that, if knowing a proposition under any guise is sufficient for knowing it *simpliciter*, speakers can know any true proposition *a priori*. The similarity between Gibbard’s argument and the argument given here, however, should be apparent.

be explicitly signaled ('tall for an elephant', 'local to the Upper West Side', 'permissible according to the law of New Jersey', and so forth), (Sentential Plenitude) will be satisfied. Even in cases of (Uniformity) violation resulting from ambiguity, expressions can be freely introduced into the language to unambiguously express the various possible disambiguated contents.

Moreover, even if natural languages tend not to be rich enough to satisfy (Sentential Plenitude) in all cases, if there is a possible language which does satisfy it, and if an argument for (Uniformity) can be constructed using a group of speakers who presuppose the grammar of that language, then there is reason to think that speakers of less expressive languages must satisfy (Uniformity), as well. Just as it would be odd for the applicability of a general principle of rational communication to depend on what interlocutors can take for granted about the grammar of their language, it would be odd for the applicability of a general principle of rational communication to depend on their language's expressive power. We thus have reason to endorse the conditional claim that if there is a compelling argument for (Uniformity) when we restrict our attention to conversations in which interlocutors speak a language which satisfies (Sentential Plenitude), then there is a compelling argument for (Uniformity) *tout court*.

The second additional premise guarantees that, in cases of (Uniformity) violation, it is never presupposed that the context set would have to be different than it in fact is for the speaker to express one of the potential contents of her utterance.

(Independence) For any conversation c , point w , and assertoric utterance u , if u violates (Uniformity) at w , then for each content p expressed by u at a point in CS_w^c there is a point w' in CS_w^c such that (i) $CS_{w'}^c = CS_w^c$ and (ii) u expresses p at w' .

Unlike (Sentential Plenitude), (Independence) is a substantive constraint on the structure of the context set. Nevertheless, (Independence) is quite plausible, holding in intuitive cases of (Uniformity) violation. In FIRE, for example, it would be odd for either Smith or Jones to presuppose that if it were Bill in the room, the common ground would have to be different than it actually is. The common ground encodes the fact that who is in the room is left open for the purposes of the conversation; it would be odd for this to be so, but for it to be taken for granted that if Ben is in the room, then who is in the room is not left open for the purposes of the conversation.

We are now in a position to construct an argument for (Uniformity) which does not rely on (Stuck). If (Uniformity) is violated, then there will be at least two distinct contents expressed by a given utterance at different points in the context set. For any two such contents, we can distinguish two types of cases: cases in which the two contents are not ordered by strength, and cases in which they are. Before proceeding to the formal proof, it will be helpful to consider an example of each type.

Hawthorne and Magidor's FIRE provides a convenient illustration of the first kind of case. Recall that Hawthorne and Magidor suggest that by accepting Jones's assertion, Smith can come to believe whatever content was in fact expressed: if Bill is in the

room, Smith comes to believe that Bill is on fire, while if Ben is in the room, she comes to believe that Ben is on fire. In either case, they argue, there is no reason to believe that Smith is not in a position to apply (Assertion Rule) to the common ground of the conversation: (Stuck) is false.

But Hawthorne and Magidor's account of FIRE does not obey (Correspondence). For suppose it is Ben in the room. Then, according to Hawthorne and Magidor, when Smith accepts Jones's assertion, she thereby rules out all points in the context set at which Ben is not on fire. But it seems reasonably clear that, even after she accepts Jones's assertion, it is acceptable for Smith to sincerely and non-rhetorically ask the question 'Is it the case that Ben is on fire?'. So, by (Correspondence), there is a point in the context set which is an element of the assertoric content of 'Ben is not on fire' as uttered by Smith or Jones — that is, a point where Ben is not on fire. It follows that Smith both does and does not rule out all points in the context at which Ben is not on fire: Contradiction.¹¹

As an illustration of the second kind of case, consider the following scenario:¹²

BIRTHDAY: Arabella and Barbarella are wrapping presents on Thursday night for their daughter Cinderella's birthday on Friday. They plan to present Cinderella with half of her presents on Friday morning and the other half on Friday evening. Arabella leaves for some time to take a work-related phone call. When she returns, Barbarella asserts, 'All the presents are wrapped; we can go to sleep.' It is common ground between the two that Barbarella either intends to convey (only) that all the morning presents are wrapped or to convey that all the morning and evening presents are wrapped, but it is not common ground between the two which of these two options obtains.

¹¹Almotahari and Glick (2010) offer an informal argument similar to this one except in that it involves non-linguistic action:

"Suppose the auditor in the Bill and Ben example loves Ben but hates Bill, vowing never to save him from a fire. If accepting the sentence 'He is on fire' amounts to accepting the proposition that Ben is on fire (since Ben is in fact the man in the room), then one would expect the auditor to come to the rescue. But since the auditor does not know whether Bill or Ben is on fire, she does not know whether she should come to the rescue. However, Hawthorne and Magidor's account predicts that she would come to the rescue, since accepting 'He is on fire' is enough to accept that Ben is on fire." (2010, 1085)

This is a good argument, as far as it goes. However, the plausibility of a connection between the common ground and rational non-linguistic action is much diminished in cases where what is presupposed is not believed, such as when interlocutors are engaged in hypothetical reasoning or plan formation. Even when what is presupposed is believed, the connection between the common ground and rational non-linguistic action is mediated in complex ways by individuals' utility functions. For both of these reasons, the enthymematic non-linguistic analog of (Correspondence) employed by Almotahari and Glick's argument is not suitable for the purposes of providing a fully general argument for (Uniformity).

¹²Here I assume that quantifier domain restriction is a semantic phenomenon, with the domain of quantification determined by the speaker's intentions. Those who accept accounts of quantifier domain restriction incompatible with these assumptions will have to devise a different illustration of the second kind of case.

Let us call the conversation between Arabella and Barbarella c and the point which represents the situation described in BIRTHDAY w . The two contents Barbarella expresses at various points in CS_w^c are ordered by strength: the proposition that all the morning and evening presents are wrapped entails the proposition that all the morning presents are wrapped, but not vice versa. Moreover, even if Arabella accepts Barbarella's assertion, it is acceptable for her to sincerely and non-rhetorically ask the question 'Is it the case that all the presents for Friday evening have been wrapped?'. It follows, by (Correspondence), that there is a point in CS_w^c which is an element of the assertoric content of the sentence 'Not all the presents for Friday evening have been wrapped' as uttered by Barbarella or Arabella — that is, a point at which not all the presents for Friday evening have been wrapped. But, since by (Assertion Rule) all such points are ruled out if Barbarella in fact intends to convey that both the morning and evening presents have been wrapped, it follows that Barbarella must not have intended to convey this. So, using only the information that her utterance violates (Uniformity), we can conclude (somewhat surprisingly) that in w Barbarella does not intend to convey that the evening presents have been wrapped. But the same reasoning can be applied to *any* point in CS_w^c which has the same context set as w . By (Independence), at least one such point must be one where Barbarella intends to convey that both the morning and the evening presents have been wrapped. So we have a contradiction: at this point, Barbarella both does and does not intend to convey that all the evening presents are wrapped.

Now for the formal statement of the proof:

Suppose we have a violation of (Uniformity): a case of rational communication in which there is an assertoric utterance u at a point w in a conversation c and distinct points w', w'' in CS_w^c such that the CS_w^c -content of u at w' differs from the CS_w^c -content of u at w'' . Then there is some set ρ of points in the context set at w such that whether the points ρ contains are ruled out of the context set by applying (Assertion Rule) to u in w depends on which content u expresses. Since this is, by stipulation, a case of rational communication, there is no problem with u being accepted. Suppose it is. Then one of two cases must obtain.

Case 1: Neither of the two contents of u is a proper subset of the other. By (Sentential Plenitude), there are sentences ϕ and ψ which uniformly express the CS_w^c -contents of u at w' and w'' respectively. So, by (Assertion Rule) and (Negation), accepting u involves ruling out either all the points in the CS_w^c -content of an utterance of $\lceil \neg\phi \rceil$ or ruling out all the points in the CS_w^c -content of an utterance of $\lceil \neg\psi \rceil$. But even after accepting u in w , it is acceptable for interlocutors to sincerely and non-rhetorically ask \lceil Is it the case that ϕ ? \rceil and \lceil Is it the case that ψ ? \rceil . By (Correspondence) as applied to the first of these sentences, at least one of the the points in CS_w^c is in the assertoric content of $\lceil \neg\phi \rceil$ as uttered at w ; similarly for $\lceil \neg\psi \rceil$ and the second sentence. But then neither all the points in the CS_w^c -content of an utterance of $\lceil \neg\phi \rceil$ nor all the points in the CS_w^c -content of an utterance of $\lceil \neg\psi \rceil$ have been ruled out of the context set at w . Contradiction.

Case 2: One of the two CS_w^c -contents of u at w' and w'' is a proper subset of the other. Then ρ is the set obtained by set-theoretically subtracting the

smaller (logically stronger) CS_w^c -content from the larger (logically weaker). By (Assertion Rule), either all the points in ρ are ruled out of the context set when u is accepted in w , or none are. By (Sentential Plenitude), there is a sentence ϕ that uniformly expresses the stronger of the two CS_w^c -contents. By (Negation), there is also a sentence $\lceil \neg\phi \rceil$ which uniformly expresses the complement of the stronger CS_w^c -content in the context set. Even after accepting u in w , it is acceptable for interlocutors to sincerely and non-rhetorically ask \lceil Is it the case that ϕ ? \rceil . So, by (Correspondence), at least one of the points in CS_w^c is in the assertoric content of $\lceil \neg\phi \rceil$ as uttered in w . Since such a point must be a member of ρ if it was not ruled out by accepting u , and since accepting u must involve either ruling out every member of ρ or no member of ρ , it follows that accepting u in w does not rule out any member of ρ . But then it must be that the weaker content of u is asserted at w . Since nothing specific about w has been assumed, this is also true at every other point w''' in CS_w^c such that $CS_{w'''}^c = CS_w^c$. But by (Independence), there is at least one such point where the stronger content of u is asserted. Contradiction.

So there can be no violation of (Uniformity). \square

5 The Second Argument

Let us define a function F from assertoric utterances u to sets of points such that, for each u , $F(u)$ is the set of points at which u expresses a truth — that is, the set of points w such that w is an element of the assertoric content of u in w .¹³ My second argument for (Uniformity) relies on two premises describing the relationship between the assertoric content of u and $F(u)$. The first of these premises formalizes the idea that accepting an assertion does not entitle interlocutors to rule out certain possibilities which, for all they presuppose, are compatible with its content:

(Stability) For any conversation c , assertoric utterance u , and point w , if the intersection of $F(u)$ and CS_w^c is σ , then applying (Assertion Rule) to the content of u at w does not result in eliminating any member of σ from CS_w^c .

The second premise formalizes the idea that accepting an assertion of a given sentence requires interlocutors to rule out all possibilities at which an assertion of the negation of that sentence would express a truth:

(Contraction) For any conversation c , assertoric utterance u of a negated sentence $\lceil \neg\phi \rceil$, and point w , if the intersection of $F(u)$ with CS_w^c is σ , then applying (Assertion Rule) to the content of an assertoric utterance of ϕ at w results in eliminating every member of σ from CS_w^c .

¹³ $F(u)$ is thus a generalization of the Stalnakerian concept of a diagonal proposition to models in which points are not identified with metaphysically possible worlds. Note that the value of F may be indeterminate for a given utterance if there are points in the model where it is indeterminate whether that utterance expresses a truth — points where the utterance does not exist, for example. I will follow Hawthorne and Magidor (2009, 389) in disregarding this complication.

Like (Correspondence), (Stability) and (Contraction) can be defended on the basis of a fundamental methodological commitment to regarding the context set as a constraint on acceptable linguistic behavior. In the case of (Stability) and (Contraction), this commitment takes the form of a tight connection between what interlocutors can acceptably assert and what effects their assertions would have on the context set — in particular, it takes the form of the principle that, *ceteris paribus*, it is acceptable to assertively utter a sentence in the course of joint inquiry just in case that sentence expresses a content which, if accepted, would narrow but not empty the context set.

With this principle in hand, suppose (Stability) were violated — suppose, that is, that it were possible to perform an assertoric utterance u and thereby eliminate some point in $F(u)$ from the context set. Consider a case in which every point in the context set is a member of $F(u)$ (that is, a case in which it is presupposed that u would express a truth). If the goal of assertion is to narrow the context set, and if this can be done by uttering u , as is predicted given (Assertion Rule) and our assumption that (Stability) is violated, our verdict must be that u would be a felicitous contribution to joint inquiry.¹⁴

Considering a case with the required structure makes it clear that this prediction is false. We can modify FIRE to provide a familiar example: suppose Smith presupposes not only that either Ben or Bill is in the room but also that whoever is in the room is on fire (and that Jones presupposes that Smith presupposes this, and so forth). Then it is presupposed that Jones's utterance of 'He is on fire', where 'he' is intended to pick out the person in room, will express a truth. If (Stability) could be violated in this case, then Jones's utterance could nonetheless eliminate some point in the context set and thereby inform Smith about some feature of the world. But this is not the intuitive judgment about the case — without straining, one can only imagine Smith rejecting Jones's utterance as infelicitous ('Duh!'/'That's so helpful.'/'Who, damn it?!'). The most straightforward explanation for this fact is that (Stability) holds.

Similarly, suppose (Contraction) were violated. Then, given the connection between the context set and admissible linguistic behavior, there would be cases in which it was presupposed that an utterance of $\lceil \neg\phi \rceil$ would express a truth, and yet asserting ϕ would be felicitous because it would narrow the context set without eliminating it entirely.¹⁵ Let us again modify FIRE — this time so that what is presupposed is that whoever is in the room is *not* on fire. If Jones were to assertorically utter 'He is on fire', her utterance would be infelicitous ('What are you talking about?').¹⁶ The most straightforward explanation for this fact is that (Contraction) holds.

In addition to (Stability) and (Contraction), our second argument will make use of a lemma concerning the interaction between the function F and the negation operator.

¹⁴In principle, one could reject (Stability) while banning such cases by introducing some further principle to the effect that (Stability) must be satisfied whenever every point in the context set is a member of $F(u)$. But I can see no way of motivating such a principle.

¹⁵Again, one could in principle render problem cases consistent with the falsity of (Contraction) by stipulation, but I will disregard this possibility.

¹⁶Andy Egan points out that it is possible to imagine Smith taking Jones's utterance as evidence that she has been mistaken about the context set of the conversation and then adjusting accordingly. But this kind of case is one in which the context set is defective; where the context set is nondefective, Jones's utterance does seem to lack a felicitous literal interpretation. The easiest felicitous interpretation of the utterance to recover is metaphorical or idiomatic.

The proposition to be established is that, for any two assertoric utterances u of sentence ϕ and u' of its negation $\lceil \neg\phi \rceil$, conversation c , and point w , if any point in CS_w^c is not in $F(u)$, then it is in $F(u')$. This can be shown as follows: Suppose our point, w' , is not in $F(u)$. Then, by the definition of F , u , as performed at w' , does not express a truth. So w' is not an element of the content p expressed by u at w' . By (Negation), u' expresses W/p at w' . So w' is an element of the content expressed by u' at w' . So u' as uttered in w' expresses a truth at w' . It follows that $w' \in F(u')$.¹⁷

(Stability) and (Contraction) enable us to give an argument for the following principle:

(Diagonal) For any conversation c , assertoric utterance u , and point w , the CS_w^c -content of u in w is the intersection of CS_w^c with $F(u)$.

The argument is as follows:

Suppose we have a violation of (Diagonal): a case in which there is an assertion u at a point w in a conversation c such that the CS_w^c -content of u in w is not the intersection of CS_w^c with $F(u)$ (call this set of points σ). Then the CS_w^c -content of u in w is either a proper subset of σ , or it contains points not in σ . If the former, then, by (Assertion Rule), accepting u in w would result in eliminating some points in $F(u)$ from CS_w^c in violation of (Stability). If the latter, then by our lemma, the CS_w^c -content of u in w contains at least one point in $F(u')$, where u' is an assertoric utterance of the sentence $\lceil \neg\phi \rceil$, and accepting u in w would fail to rule out this point, violating (Contraction).

So there can be no violation of (Diagonal). \square

For any assertoric utterance u , let us call the set $F(u)$ the *superdiagonal content* of u . Then the second argument for (Uniformity) establishes that the content expressed by an assertoric utterance at a point always agrees with the superdiagonal content of that utterance over the context set at that point. Though this conclusion does not entail the further claim that the assertoric content of an utterance at any point *is* its superdiagonal

¹⁷This argument tacitly appeals to an additional principle, namely:

(Propositionality) For any assertoric utterance u , conversation c , and point w , if w is in CS_w^c , then there is a content p such that u expresses p at w .

(Propositionality) is in tension with treatments of presupposition failure in terms of undefinedness, since such treatments explain the infelicity of a speaker asserting a sentence carrying a presupposition inconsistent with the common ground of her conversation in terms of its failure to express a content at any point in the context set. Those sympathetic to such treatments of presupposition failure need not be overly concerned, however, as my endorsement of (Propositionality) is a matter of convenience rather than necessity. My second argument for (Uniformity) could be reconstructed in an undefinedness-friendly way by adding to (Stability) and (Contraction) the further principle that applying (Assertion Rule) to the content of an utterance at a point results in eliminating from the context set of the conversation at that point every point at which the utterance does not express a content. This principle is defensible on much the same grounds as (Contraction); if it were false, one would expect the existence of felicitous utterances carrying presuppositions inconsistent with the conversational common ground.

content, it strongly suggests it.¹⁸ There is a compelling inference to the best explanation from (Diagonal) to this stronger proposition; in the absence of countervailing evidence, we ought to accept that the content of an utterance at any point is its superdiagonal content. But if this latter claim is true, (Uniformity) follows immediately.

6 Uniformity and Introspection

In addition to challenging Stalnaker's argument from (Assertion Rule) to (Uniformity), Hawthorne and Magidor (2009) offer a direct argument against the latter. The conclusion that the content of an assertion is always its superdiagonal content suggests a natural way for the Stalnakerian to respond to this argument. Hawthorne and Magidor show that, given the Stalnakerian assumption that an assertoric utterance of a sentence at a point expresses that sentence's semantic content unless this would result in a violation of (Uniformity), and given that there can be failures of positive and negative introspection for presupposition, there will be violations of (Uniformity). Stalnaker's response (2009) is to defend positive and negative introspection. The response suggested by the second argument for (Uniformity), however, is to give up the idea that an assertoric utterance ever expresses anything other than its superdiagonal content. Choosing this response allows one to concede that there can be violations of both positive and negative introspection without having to concede that there are corresponding violations of (Uniformity).

Hawthorne and Magidor (2009) anticipate this superdiagonal proposal and offer two arguments against it. First, they argue that it fails to respect the intuitive connection between a sentence and its subject matter:

“In so far as we are permitted any intuitive fix at all on the asserted content, the proposal will lead to wildly unintuitive consequence[s]. If I assert ‘He is on fire’ there is some possible world where the sounds I produce have the semantic content that there are three goldfish in the room. According to the superdiagonal proposal, my asserted content has no more to do with fire than it has to do with goldfish. Sure enough, the proposal can explain why I get fire-theoretic information—namely by intersecting the assertion with the context set. Nevertheless, our intuitive sense that the assertion itself has something to do with fire rather than goldfish is blatantly violated.” (2009, 389)

But the observation that the superdiagonal view assigns a content to ‘He is on fire’ that “has no more to do with fire than it has to do with goldfish” until the context set is considered need not trouble the theoretician concerned with modeling inquiry. A theory designed to capture the contribution of an utterance to inquiry should recognize that there are certain circumstances, radically unlike actual circumstances though they may

¹⁸Earlier in this section, the notion of superdiagonal content was specified partly in terms of the notion of assertoric content. I now propose to specify the notion of assertoric content in terms of superdiagonal content. But fear not — circularity is avoided by the fact that an independent characterization of superdiagonal content is available (see section 7 below).

be, under which the sentence ‘He is on fire’ *would* convey information about goldfish. This is a manifestation of the fact that the pairing between syntactic structures and meanings effected by any language is essentially arbitrary, being fixed by convention.

Of course, there is a sense in which the content of the sentence ‘He is on fire’ has to do with fire and not goldfish. Given the grammar of English, that sentence is used to convey information about fire and not about goldfish. A theory of content primarily concerned with capturing facts about the grammar of English would be mistaken if it paired ‘He is on fire’ with a fishy content. But a theory of the role of assertion in inquiry need not be (and, if my arguments are sound, cannot be) such a theory.

This brings us to Hawthorne and Magidor’s second argument against the superdiagonal proposal:

“Superdiagonal content is constructed out of semantic content. It thus assumes the reality of semantic content. But on the current proposal, semantic content is never asserted. It is surely rather troubling to insist on the reality of semantic content but detach it altogether from the facts about what is asserted.” (2009, 389)

This argument hinges on the idea that associating each assertoric utterance with its superdiagonal proposition in one’s model of inquiry precludes assigning semantic content an appropriate role in one’s broader theory of communication and linguistic competence. But to claim that there is reason to embrace a (Uniformity)-satisfying notion of the content of assertoric speech acts from within the possibility-carving framework is not to claim that there are not other, equally important notions of the contents of assertoric speech acts which do not satisfy (Uniformity). In fact, it is clear that there are. A brief reflection on the theoretical role of one such notion of content will clarify why Hawthorne and Magidor’s second argument against the superdiagonal view is not decisive.

The notion of content I have in mind is familiar: contents are paired with the sentences of a language by linguistic rules; mastery of these rules constitutes (or is at least a necessary condition on) speakers’ knowledge of that language. Following Hawthorne and Magidor (2009, 379), let us use the term *semantic content* to describe this species of content “determined by the standard compositional mechanisms of the language”. It is not obvious that the semantic content of an utterance is, on this construal, a form of content (in the sense of a set of points). Following Lewis (1980), we might instead regard the entity delivered by the compositional semantics when it is given an utterance as a function from ordered pairs of CP-contexts and indices to truth values, where CP-contexts are points centered on individuals and times and indices are ordered n -tuples containing more than simply a point parameter.¹⁹

Even if standard compositional mechanisms fail to deliver genuine contents for utterances, such contents can easily be recovered from them. In fact, this can be done in multiple ways: for a given utterance u of sentence ϕ at a point w , we can recover the *horizontal content* expressed by u at w by building a CP-context out of w together with

¹⁹Though see King (2003) and Glanzberg (2011) for criticisms of this picture.

the speaker and time of u at w , feeding this CP-context into the semantic content of ϕ , using it again to fill in values for all the parameters in the index of the semantic content of ϕ except the point parameter, then abstracting over the point parameter. Alternatively, we can recover the superdiagonal content expressed by u by: for each point w at which u exists, using u to construct both a CP-context and its corresponding index, then feeding each such CP-context/index pair into the semantic content of ϕ , and finally including w in the superdiagonal content just in case the result of this procedure is the True. It is the notion of Lewisian semantic content (or perhaps the related notion of horizontal utterance content) which Hawthorne and Magidor seem to have in mind when they argue that something has gone wrong if ‘He is on fire’ has no more to do with fire than it has to do with goldfish.

The idea that there are rules pairing syntactic forms (and thus, indirectly, utterances instantiating such forms) with semantic contents is of central importance to the project of explaining human linguistic competence. But a theory developed with the goal of capturing these rules need not assign sentences or utterances the same contents as the possibility-carving theory articulated above. It is plausible, for example, that the linguistic rule used to determine the referent of the demonstrative ‘that’ in context does not appeal to the context set at all; perhaps it takes into consideration only facts about the speaker’s intentions and gestures, or perhaps it takes into consideration only some abstract salience ranking among possible referents, or perhaps it takes into consideration both of these as well as the capacities of an informed ideal audience — on any of these views, there can be violations of an analogue of (Uniformity) for horizontal utterance content when interlocutors are ignorant about the factors relevant to securing the referent of the demonstrative.

Indeed, as Hawthorne and Magidor emphasize, positing a notion of content which is tied to linguistic rules and does not satisfy (Uniformity) allows the theoretician to tell a story about how speakers are able to assign a (Uniformity)-satisfying variety of content to utterances — they do so by considering what horizontal content the semantic rules would assign to an utterance at each point in the context set, then treat the sentence as expressing the content that eliminates every point where the rules assign to the utterance a content which is false at that point. This is Stalnaker’s process of diagonalization; Hawthorne and Magidor’s idea is that it makes little sense to speak of superdiagonal content unless each utterance is associated with a horizontal content at each point in the context set. It is not clear that this idea is correct, since both the superdiagonal and the horizontal content of an utterance can be defined directly from its semantic content. Nevertheless, I think it should be conceded that the notion of horizontal utterance content is of independent theoretical interest.

But one can recognize the existence and theoretical interest of semantic content and horizontal utterance content without identifying them with assertoric content. In other words, the following three propositions are perfectly consistent, both logically and in terms of fitting naturally into a coherent theoretical outlook: (i) the assertoric content of an utterance is always its superdiagonal content; (ii) explaining linguistic competence requires appealing to both a notion of semantic content and a notion of horizontal utterance content; (iii) the notion of horizontal utterance content can be used to define the notion of the superdiagonal content expressed by an utterance. So Hawthorne and Magidor’s second argument against the superdiagonal proposal is not successful.

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