Carnap's Tolerance, Language Change and Logical Pluralism

GREG RESTALL*
PHILOSOPHY DEPARTMENT, MACQUARIE UNIVERSITY
Greg.Restall@mq.edu.au
May 16, 2001
http://www.phil.mq.edu.au/staff/grestall/cv.html

Abstract: In this paper, I distinguish different kinds of pluralism about logical consequence. In particular, I distinguish the pluralism about logic arising from Carnap's *Principle of Tolerance* from a pluralism which maintains that there are different, equally "good" logical consequence relations on the one language. I will argue that this second form of pluralism does more justice to the contemporary state of logical theory and practice than does Carnap's more moderate pluralism.

1 *Pluralism about Logical Consequence*

With JC Beall, I have argued for and defended a very particular account of logical pluralism [5, 6]. We take it that the notion of logical consequence is irreducibly plural in its application. That is, we take it that there are at least two distinct relations of logical consequence — and not simply two distinct relations in intension, but two distinct relations in extension. We take it that there are arguments which are valid according to one logic, and invalid according to another, and that there is no further fact of the matter as to whether the argument is *really* valid. For the sake of this paper let me be quite specific. I will take two particular argument forms. First, the argument form I will call *explosion*:

$$\text{From } A \wedge {\sim}A \text{ to infer } B.$$

This argument form is *valid* classically, and *invalid* relevantly. Similarly, the argument form of *disjunctive syllogism*:

$$\text{From } A \vee B \text{ and } {\sim}A \text{ to infer } B$$

is valid classically, and invalid relevantly [8]. As a pluralist about logical consequence, I take it that there is no further fact of the matter as to whether explosion, or disjunctive syllogism are *really* valid. For me, that question makes no more sense than to ask if a function on the real line is *really* smooth, without

*Thanks to Peter Simons for asking the question "Isn't your pluralism just Carnap's tolerance?" I hope that I have managed to explain why it isn't. Many thanks to JC Beall for discussion on the topics raised in this paper. Although we have written extensively on pluralism together and I have benefited greatly from working with him, the paper expresses my opinions, not his. Thanks also to Martin Allen, Robert Anderson, Nuel Belnap, Daniel Nolan, Koji Tanaka, and audiences at the Center for Philosophy of Science at the University of Pittsburgh and the Philosophy Departments at the Universites of Toronto and Queensland for comments on this paper. This research has been supported by the Australian Research Council, through Large Grant No. A00000348, and by Koji Tanaka who relieved me of some of my teaching duties for Semester 2, 2000.

saying more about the notion of smoothness. A function might be smooth in the sense of *continuity* without being smooth in the sense of *differentiability*. The same goes with logical consequence. I take it that this is a pretheoretic notion which may be made precise in a number of different ways.

I will not say very much more about what these two notions of logical consequence consist in.[1] Suffice to say that the relation I will call *classical logical consequence* agrees with classical propositional logic at the level of conjunction, disjunction and negation. I also take it that given a classically valid argument, it is never the case that the premise is true and the conclusion is not. That is, I *endorse* classical reasoning, in the sense that I think that I will never step from truth to untruth in taking the step from premises to a conclusion in a classically valid argument.[2]

The relation I will call *relevant logical consequence* agrees with *first degree entailment* [1, 12, 29, 30]. First degree entailment rejects the inference of explosion and its dual, which infers $B \vee \sim B$ from A. Obviously, since I endorse classical reasoning, I endorse relevant reasoning in the same sense — relevantly valid arguments also never take us from truth to untruth. However, I think that relevantly valid arguments do more. I take it that if you have a relevantly valid argument, and if the premises are true in a *situation* then the conclusion is true in that situation too. Relevantly valid arguments never take us from what is true-in-a-situation to something not true-in-that-situation. The inference from A to $B \vee \sim B$ may because $B \vee \sim B$ may well fail in a situation (a situation may be incomplete) and explosion may fail because $A \wedge \sim A$ may be true in a situation (a situation may be inconsistent).[3]

Obviously, I need to make this much more precise if I am going to do work with the notion of truth-in-a-situation. But that would take us outside the scope of this paper. Suffice it to say that I think that the relevant notions can be made more clear [3, 26, 28]. These vague gestures should be enough to explain why the two notions of logical consequence are of interest to the pluralist.

2 *Carnap's Tolerance*

Carnap is a natural hero to logical pluralists. For Carnap, logic is of fundamental importance to philosophical inquiry, but nothing about this inquiry (or about anything else) narrows the field of play to just one logic. For example, in *The Logical Syntax of Language* he wrote:

> The first attempts to cast the ship of logic off from the *terra firma* of the classical forms were certainly bold ones, considered from the historical point of view. But they were hampered by the striving after 'correctness'. Now, however, that impediment has been overcome, and before us lies the boundless ocean of unlimited possibilities. [10, page xv]

[1] Beall and I have explored these notions at greater length elsewhere [4, 5, 27, 28].

[2] So, I am not a *dialetheist* who thinks that some contradictions are true. For if I were, I would take it that some instances of explosion would take me from truth to untruth, at least if *some* claim were untrue.

[3] None of this is intended to presume an answer, either positive or negative, to the issue of whether situations provide a *reduction* of relevant consequence. Nothing hangs on whether situations are parasitic on relevant consequence, or if relevant consequence is parasitic on situations, or if neither "reduces" to the other.

This is stirring material. There is much for us to like in this paragraph. If we ought to investigate non-classical accounts of logic, without concern for 'correctness,' then there is a great deal of scope for plurality. We may develop many different accounts of logical consequence, and let the dice of adequacy to our requirements in language-building fall where they may. The realm of possibilities in logical theorising is indeed boundless and unlimited. But *how* has the impediment of striving after 'correctness' been overcome? For Carnap, the answer is the principle of tolerance.

> *Principle of Tolerance: It is not our business to set up prohibitions, but to arrive at conclusions.* [10, §17]

Carnap's aim is not to ban the choice of this or that logic, but to explore the consequences of such choices. This is expanded elsewhere in Section 17 of *The Logical Syntax of Language*. He writes:

> *In logic, there are no morals*. Everyone is at liberty to build his own logic, i. e. his own form of language, as he wishes. All that is required of him is that, if he wishes to discuss it, he must state his methods clearly, and give syntactical rules instead of philosophical arguments. [10, §17]

For the Carnap of this period, all there is to logic is language adoption, and language adoption is radically unconstrained. If we wish to construct a language with rules like those of classical propositional logic, we may. If we wish to construct a language with weaker powers of inference, such as in a relevant logic, we may do that also. Carnap himself does this, by developing two systems, *Language I*, which embodies some constructive constraints, and *Language II* which is a rich, classical type theory. This tolerance goes well beyond what we might feel comfortable to call *logic* today. For Carnap, languages could contain all sorts of inferential machinery such as arithmetic and rich theories of types and functions. All the content of which was simply a part of the choice of the *language*, no matter how rich the mathematical theories were which have been adopted. The important constraint, if it is indeed a constraint, is that the language builder explain what principles are being used, in a clear, syntactic manner, as befits the choice of a language. If you wish to build a language containing a symbol, written '$\sim$' which satisfies the rules of the classical account of negation, that's your prerogative. If, instead, you wish to build a language containing a symbol, also written '$\sim$' which satisfies the rules of a relevant account of negation, that is fine too. For Carnap, the choice of which language is to be preferred is a pragmatic one, to be answered by asking: what is the language *for*? Is your aim to give a comprehensive theory, able to prove as much as you can in a simple way? Classical negation might be for you. Is your aim to avoid contradiction and limit it if it arises? Then relevant negation might be for you.

Given this perspective of logic and language use, it is clear that the question *is this argument valid?*, when asked of a particular argument in a particular language, can be asked in two ways. It can be asked as an *internal question*, taking the choice of language of the argument for granted. In this case, it will be addressed by reference to the rules governing that language. Explosion is valid classically, but invalid relevantly.

The question may also be asked *externally*: We can ask "Should I choose a classical language, or a relevant one?" Here, the considerations do not give us an answer to the question "Is this argument *really* valid" but rather, they are reasons to adopt one language over another. After all, if we ask if a particular argument is valid or not, then if we know the language the argument is given in, the language itself will determine the validity or otherwise of the argument. For Carnap, to choose a logic just is to choose a language. So, we can see the question "Ought I take this argument to be valid" as asking something like this: "Ought I *interpret* this argument as being in Language X or as in Language Y?"

It is unclear how far Carnap's Tolerance may be defended in the light of Quinean criticisms of analyticity. Carnap is committed to a strong notion of analyticity, bound up with language construction and choice.[4] Valid inferences are correct *merely* in virtue of language adoption. Other truths expressible in the language do not become true in the same way. I will not discuss how one might defend Carnap's views against these criticisms, for whether or not Carnap can be redeemed is irrelevant to the dialectic of the rest of this paper. In what follows, I will need just a *part* of Carnap's doctrine, and this will be a part of Carnap's view that Quine happily adopts. It can put crudely as follows:

Any difference in logical consequence is due to a difference in languages.

This is a commitment that Quine shares with Carnap, as we will see, and it is enough to distinguish Carnap's pluralism from the kind of pluralism I wish to defend.[5]

It is clear, then, that Carnap's Tolerance fosters a kind of pluralism about logical consequence which differs from the kind of pluralism I have presented in Section 1. For Carnap, diverging analyses of the validity of an argument result from diverging languages. The disputants in a dispute over the validity of an argument literally disagree in their *reading* of the argument. Given the disambiguation of the choice of a language there can be no real disagreement, provided that the disputants know what language they speak. This is especially bad for a *pluralist*, who has appeared to have disagreed with herself. She is simply confused, equivocating from one language to another. Instead of saying that the argument is valid on one sense and invalid in another, she must be saying "I can read the argument like *this* or I can read it like *that*." I take it that this conclusion is unacceptable to my pluralism. If accepting different logics commits one to accepting different languages for those logics, then our pluralism is primarily one of *languages* (which come with their logics in tow) instead of *logics*. To put it graphically, as a pluralist, I wish to say that

$$A, {\sim}A \vdash_C B \textit{ but } A, {\sim}A \nvdash_R B$$

[4] A fruitful discussion of Carnap's views can be found in Friedman's *Reconsidering Logical Positivism* [15]. I am in broad agreement with Friedman's analysis of Carnap's views in *The Logical Syntax of Language*, though the detail of that analysis is not necessary for the argument of this paper.

[5] This is a commitment which is most likely very widely shared. Etchemendy, for example, gives a strong statement of the view in his unpublished "Reflections on Consequence," [14] where he presents a view of logical consequence intimately tied to language identity. For Etchemendy, each language comes with one and only one consequence relation.

A and ~A together, *classically* entail B, but A and ~A together do not *relevantly* entail B. On the other hand Carnap wishes to say that

$$A, {\sim_C} A \vdash B \textit{ but } A, {\sim_R} A \nvdash B$$

A together with its *classical* negation entails B, but A together with its *relevant* negation need not entail B.

The domain of variation differs considerably between analyses.[6] For Carnap it isn't the one argument form which we evaluate differently — it is two different argument forms. In the rest of this paper I will ask whether Carnap's analysis is mandatory, or whether there is scope for the pluralist to admit different consequence relations over the one language.

3 *Language Identity*

There might be a number of reasons why you might take the proponents in a disagreement over logical consequence (such as that over explosion or disjunctive syllogism) use different languages. In this section I will examine *three* reasons, and show that none of them leads to insurmountable problems for the pluralist. In doing so, we will see what resources the thoroughgoing pluralist can have for admitting more than one consequence relation on the one language.

3.1 Quine

The first fully-developed argument to the effect that a difference in logical principles marks a difference in language is to be found in Quine's work. The most well-known presentation of the argument is in his *Philosophy of Logic*.

> To turn to a popular extravaganza, what if someone were to reject the law of non-contradiction and so accept an occasional sentence and its negation as both true? An answer one hears is that this would vitiate all science. Any conjunction of the form 'p $\wedge \sim$p' logically implies every sentence whatever; therefore acceptance of one sentence and its negation as true would commit us to accepting every sentence as true, and thus forfeiting all distinction between true and false.
>
> In an answer to this answer, one hears that such a full-width trivialization could perhaps be staved off by making compensatory adjustments to block this indiscriminate deducibility of all sentences from an inconsistency. Perhaps, it is suggested, we can so rig our new logic that it will isolate its contradictions and contain them.
>
> My view of this dialogue is that neither party knows what he is talking about. They think they are talking about negation, '~', 'not'; but surely the notation ceased to be recognizable as negation when they took to regarding some conjunctions of the form 'p $\wedge \sim$p' as true, and stopped regarding such sentences as implying all others.

[6] Carnap *at least* wants to say this. He probably also wants to say that in the first consecution, the A and B range over sentences in language C and in the second they range over sentences in language R.

> Here, evidently, is the deviant logician's predicament: when he tries to deny the doctrine he only changes the subject. [23, page 81]

The particular view presented here goes back many years. Hints are first found in "Truth by Convention" (written in 1936) and "Carnap and Logical Truth" (written in 1954). In "Truth by Convention", he considers the consequences of adding a one place connective $\sim$ to a language (together with other logical machinery) in order to show that a mere convention suffices to account for the truth of the theorems of logic.[7] In this discussion, a "mark in the margin" indicates that the corresponding expression is taken to be true.

> If we make a mark in the margin opposite an expression '—', and another opposite '$\sim$—', we sin only against the established usage of '$\sim$' as a denial sign. Under the latter usage '—' and '$\sim$—' are not both true; in taking the both by convention as true we merely endow the sign '$\sim$', roughly speaking, with a meaning other than denial. [22, page 90]

So, violating the principle of non-contradiction by taking an expression and its '$\sim$-negation' to both be true simply rules out the interpretation of '$\sim$' as negation. In "Carnap and Logical Truth" the discussion shifts to considering the issue of a disagreement between two people ostensibly sharing a language.

> When someone disagrees with us as to the truth of a sentence, it often happens that we can convince him by getting the sentence from other sentences, which he does accept, by a series of steps each of which he accepts. Disagreement which cannot be thus resolved I shall call *deductively irresoluble*. Now if we try to warp the linguistic doctrine of logical truth around into something like an experimental thesis, perhaps a first approximation will run thus: *Deductively irresoluble disagreement as to a logical truth is evidence of deviation in usage (or meanings) of words.* [21, page 105]

These are early graspings toward an argument which finds its maturity in *Word and Object*. Here Quine formulates the scenario of *radical translation*. In this famous scenario, Quine considers what evidence is to hand when a field linguist seeks to translate a completely unknown language into English. Quine's claim is that the available evidence (the correlation of utterances and stimulus situations) does not pin down a single translation manual as favoured. Of course there are certain canons of translation which ought to be followed, if we are to have an 'acceptable' translation, but these canons do not fix a single translation, and so, they do not fix 'meaning'. The major principle is the principle of charity. When translating, the field linguist presumes that the language users are rational and are not generally mistaken about everything.

> The semantic criterion of negation is that it turns any short sentence to which one will assent into a sentence from which one will dissent, and vice versa ...
>
> The maxim of translation underlying all this is that assertions startlingly false on the face of them are likely to turn on hidden differences of

[7] He then shows that you can do this for *any* term, making any truth a truth by convention, evacuating any distinction you can draw by calling something "true by convention".

> language. This maxim is strong enough in all of us to swerve us even from the homophonic method that is so fundamental to the very acquisition and use of one's mother tongue.
>
> The common sense behind the maxim is that one's interlocutor's silliness, beyond a certain point, is less likely than bad translation — or, in the domestic case, linguistic divergence. Another account of the matter, as it touches logical laws in the domestic case, is as follows. The logical particles 'and', 'all', etc. are learned only from sentential contexts. Dropping a logical law means a devastatingly widespread unfixing of truth values of contexts of the particles concerned, leaving no fixity to rely on in using those particles. [20, pages 57, 59 and 60]

As this quote shows, Quine applies these results in generality. They are not restricted to the situation of the field linguist, since no-one, when learning a language, has access to any evidence that the field linguist lacks.

The presentation is somewhat more muted in Quine's recent book, *Pursuit of Truth*, but the general point remains.

> Our linguist then goes on tentatively identifying and translating observation sentences. Some of them are perhaps compounded out of others of them, in ways hinting of our logical particles 'and', 'or', 'but', 'not'. By collating the situations that command the natives' assent to the compounds with the situations that command assent to the components, and similarly for dissent, the linguist gets a plausible line on such connectives. [24, pages 44,45]

In the rest of this section, I will assume that Quine's general thesis is sound; that the available evidence underdetermines appropriate translation. In this way I will not attempt to solve the problem by being anti-Quinean. The task then, is to understand what is going on in a disagreement over disjunctive syllogism, or over explosion. Does any such disagreement involve a bifurcation of languages?

Consider the case where we have a classical reasoner (for simplicity, we'll call our chosen reasoner "Quine") who tries to interpret my utterances, as a pluralist who *at least* adopts relevant consequence. Now Quine can question me as much as he likes, asking whether I agree or disagree with various sentences. And generally speaking, if I agree with "p", I will disagree with "not p", and *vice versa*. Even if he tries asking me tricky paradoxical sentences, like his favourite version of the liar paradox

> "Yields falsehood appended to its quotation" yields falsehood appended to its quotation.

I will simply demur, as I do not have a settled opinion on the truth values of paradoxical sentences like these. Quine will eventually have to agree that my use of "not" agrees with his, insofar as the manipulation of the values of assenting and dissenting goes, as it meets all of the requirements he gives for a connective to be a negation.[8]

[8]Of course, even some monists who accept classical logic think that "not" and denial come apart [32], so if we wish to reject Quine's close connection between negation and denial, we can

However, we are not home yet. Recall that Quine said in *Philosophy of Logic* that it was as soon as the interlocutors "stopped regarding such sentences [contradictions] as implying all others" that the discussion stopped being about negation. Well, if Quine wants to ask me, he will see that I do not think that contradictions generally imply *everything*. (Interestingly, this consideration appears only in *Philosophy of Logic*, not in his works where he develops the translation argument in some detail.) Does this mean that my use of negation diverges from his? I think it need not. One reason for this is Quine's own use of terms like "imply". For Quine, the only implication worth talking about (or at least, theorising about) is material implication. That is, an implication of the form "if p then q" if it is to be given any truth conditions at all, is to be read as simply saying "either not p or q". So, for Quine, implication is a derivative notion, and it plays no important place in his theorising.[9] So, what should Quine deduce when I deny some of his claims of the form "if p and not p then q"? He should probably conclude that my usage of *implication* or *consequence* differs from his, but this would not be surprising. This impression would be strengthened if he went on to ask me the question, phrasing the conditional in its material form. For to any claim of the form "not (p and not p) or q" I will agree, simply because I always agree that "p and not p" is false. So Quine ought to conclude that my use of the truth functions is completely "classical." We do not disagree in our reading of the negation connective in an argument like explosion or disjunctive syllogism. The *Quinean* route to language variance in the fragment of our language including at least the boolean connectives of conjunction, disjunction and negation is blocked. But it was just this language in which different consequent relations reside. So, a Quinean argument is not sufficient to close the door to pluralism.

3.2 Truth conditions?

Quinean considerations about translation are not the only motivations for thinking that differences in logical consequence give rise to differences in languages. Another charge against the possibility of pluralism comes from the quarter of truth conditional semantics. If "not" in the mouth of the classical reasoner has different truth conditions to "not" in the mouth of the relevant reasoner, then if the meaning of a particle like "not" consists in its truth conditions, then when a classical reasoner and a relevant reasoner both say "not" they mean different things — and thereby speak different languages.

Do the proponent and opponent of a disagreement over disjunctive syllogism or explosion agree about the truth conditions of statements of the form of $\sim A$? It seems obvious that they do not. After all, the classical reasoner will happily assent to claims in the semantics of a logic of the form

$$\sim A \text{ is true in } x \text{ if and only if } A \text{ is not true in } x$$

And the relevant reasoner, famously, will prefer other claims analysing the behaviour of negation. There are many different candidate analyses. The one I prefer [13, 28] goes like this:

do so in a way that does not beg the question against the classical monist. I am happy to keep the correlation between negation and denial, and so, I can expect that Quine will find my "not" used to express negation.

[9] As any cursory checking of the indices of his books for words like "implication", "consequence", "entailment" or "conditional" will attest.

$\sim A$ is true in x if and only if
A is not true in y for any y compatible with x.

These are different analyses of negation. Does it not follow that different connectives being analysed?

This need not follow at all. Granting, for the moment, that *meaning* identity requires identity of *truth conditions*, it is not obvious that the truth conditions of negation must be analysed differently by the relevant reasoner and the classical reasoner. There are a number of options available for the pluralist. I will examine just two.

MINIMALIST TRUTH CONDITIONS: First, we could be *minimalist* about truth conditions. We could agree with Davidson and others that truth conditions are bare biconditionals connecting sentences and the predications of truth, such as this:

$\sim A$ is true if and only if A is not true.

The classical and relevant reasoners can agree that this biconditional is true, and if this is all there is to say about the meaning of $\sim$, we have no disagreement over its meaning. More must be said of how the two clauses presented by our partners relate to the meaning constraint given by the T-biconditional. One plausible way of doing this is to take the clause "$\sim A$ is true in x if and only if A is not true in x" as quantifying over "worldlike" objects while the "relevant" clause "$\sim A$ is true in x if and only if A is not true in y for any y compatible with x" quantifies over "situationlike" objects. Given that $\sim$ has the natural truth conditions, we can take the semantic clauses in formal model theories of different logics as picking out different kinds of objects.

MAXIMALIST TRUTH CONDITIONS: Perhaps we need more than simple bare T-biconditionals as truth conditions. Perhaps we need truth conditions to say more about the different "worlds" or "situations" in which claims are true. Another way we can find harmony between the classicalist and the relevantist is to take the truth conditions of negation to be the collection of *all* of the semantic clauses used, in either the classical or the relevant semantics. All we need to do to ensure that we have no *difference* of meaning is to ensure that the two accounts do not clash. But they do not. If a "world" is simply a consistent and complete "situation" then the two accounts agree where they overlap [6, 28]. The most disagreement that we have is that the classical logician does not use as *comprehensive* a part of the truth conditions of negation as does the relevantist. To show that classical and relevant negation are connectives with different truth conditions, the monist must now show that one of the accounts is defective, and this is no longer an argument against pluralism *per se* but an argument against either the classical or the relevant account of negation. As such, I can leave it aside.

It follows that we have more than enough ways to reconcile the claim that meaning identity requires identity of truth conditions with pluralist accounts of logical consequence. Concern for truth conditions gives us no reason to reject pluralism.

3.3 Inferential role?

I will end this section of the paper by examining one more argument against the claim that the pluralist can be univocal. Do two different logical consequence relations agree about the *inferential role* of statements of the form $\sim A$? It seems obvious that they do not. I will attempt to argue that this is less obvious than it might first appear.

I will not adjudicate between non-normative [16] and normative [9] inferential role accounts of the meanings of logical vocabulary such as negation, as the point of this argument can be made equally well according to either account, and so can the pluralist's response to the objection. First consider Brandom's inferentialism. For Brandom, questions of meaning are questions of commitment and entitlement, and these are essentially *normative* questions. We can explicate the inferential role of negation as follows: Commitment to $\sim A$ is incompatible with entitlement to A, and entitlement to A is incompatible with commitment to $\sim A$. Note that nothing here has decided the issue between proponents of classical or relevant consequence. The classicalist and the relevantist can agree about how commitment and entitlement relate to negation.

Given that basic agreement, different logics may well relate to entitlement in different ways. For example, it is plausible that you are never entitled to the premises and the negation of the conclusion of a classically valid argument. For example, you are never entitled to $(A \wedge \sim A) \wedge \sim B$, simply because one is never entitled to the first conjunct $A \wedge \sim A$. A relevant logic is a much more plausible candidate for the "logic" of commitment preservation. Given a relevantly valid argument, if you are committed to the premises, you are, in virtue of this, committed to the conclusion too. In this way we can agree that no-one is really *entitled* to a contradiction $A \wedge \sim A$ (classical logic as a logic of entitlement rules that out) while still maintaining that commitment to a contradiction does not bring along with it commitment to anything and everything. It is quite natural for an inferentialist like Brandom to be a pluralist about logical consequence.[10] Much more needs to be said to make this a clear presentation of the notions of logical consequence arising out of Brandom's analysis of meaning, but the basic point has been made. Brandom is not an *inferentialist* in the sense of someone using a basic relation of inference to determine the meanings of parts of our language. No, Brandom uses the basic notions of commitment and entitlement to do this job. None of this picks out a unique fundamental relation of logical consequence. An inferentialist such as Brandom may be a pluralist about logical consequence.

To end this section I will consider a more difficult case for the pluralist: Harman's account of the meanings of logical constants [17]. For Harman, the meaning of the logical constants is to be found in the *basic* valid inferences in which they feature. In this way, despite the fact that $\sim(\sim A \vee \sim B)$ and $A \wedge B$ are inferentially equivalent, they have different meanings, because the *basic* inferences involving $\sim(\sim A \vee \sim B)$ differ from those involving $A \wedge B$, as they must use negation and disjunction rules, not conjunction rules. If we are a pluralist about consequence, what can we make of Harman's analysis? It appears that a relevantist and a classicalist do not share the one class of basic inferences

[10] For details of how to make explicit the "logics" of commitment and entitlement, on Brandom's account, the papers by Lance and Kremer [18, 19] and some forthcoming material of Lance are good places to start.

involving negation, and so, a meaning-change threatens. Again, there seem to be a number of possible responses the pluralist can make.

"INFERENCES" ARE NOT LOGICAL CONSEQUENCE: One response is that the *inference* required to fix meaning is not logical consequence at all, but something else, such as dispositions to believe, or perhaps something normative. If we read "inference" in this account as not picking out a kind of logical consequence, then the fact that inference plays such a central role in determining meaning is not a problem for the pluralist. This is the adaptation for Harman of our response to criticism based on Brandom's inferentialism. The basic "inferences" are not themselves a logic, and logical consequence relations can be built out of these basic "inferences" in a number of different ways.

While this is a satisfying response to Brandom's inferentialism, it seems strained in this context. For Harman, the meaning determining inferences featuring negation just *are* basic natural deduction inferences from a proof theory of a particular logic [17].

PICK ONE CONSEQUENCE RELATION: If we grant, with Harman, that each connective has a meaning, and such a meaning is to be found with its inferential role analysed as the basic inferential moves in a natural deduction system, the other response available is to bite the bullet. We may admit that the basic rules do pick out one consequence relation. Again, as with the case of truth conditions, there is a *minimalist* and a *maximalist* response.[11] The maximalist response takes the meaning determining rules to be those of classical logic, the minimalist response takes meaning to be determined by the weaker rules of relevant consequence. The point is the same with both responses. We can pick *one* of our plurality of consequence relations as determining the meaning of a connective. If we take the primitive classical negation rules as the ones used to determine the meaning of negation, then we take the weaker relevant rules tell us something else about the behaviour of *that* connective. If any set of rules is sufficient to pick out a single meaning for the connective, take that set of rules, and accept those as meaning determining. The other rules are important when it comes to giving an account of a kind of logical consequence, but they are not used to determine meaning.

Does this threaten pluralism about logical consequence? I agree that the response is *odd*. It does seem to single out a single consequence relation as best for a particular job — the job of elucidating meanings.[12] The fact that a particular consequence relation is best suited for some job or other does not mean that we have become less pluralist. The doctrine is that each logical consequence relation is equally *logical*, not that each consequence relation is equally good for everything. I already agree that one logic (a logic which is classical in the language of conjunction, disjunction and negation) is best for necessary truth preservation; that another is best for considerations of relevance. If one is best for cashing out the meanings of sentence operators, then so be it.

[11] Though here the *maximalist* response is broadly classical and the *minimalist* response is more non-classical, in contrast to the case with truth conditions.

[12] Actually, it does no such thing. It simply picks out a single set of inference rules for each part of the language which is given an inferential account of meaning. There is nothing to say yet that each set of inference rules must come from the same logic. However, it is hard to see how or why the rules might come from different consequence relations.

INFERENCE *Schemes*: There is one more radical approach to the problem. The crucial idea here is that the basic properties of negation are indeed encoded in inference patterns like these:

$$\frac{X \vdash A, Y}{X, \sim A \vdash Y} \qquad \frac{X, A \vdash Y}{X \vdash \sim A, Y}$$

Here, the inference patterns determines the meaning of the connective.[13] The meaning is presented in the two rules. Where the *variation* in the rules appears is in the behaviour of the *structural rules* in the inferences [7, 11, 25, 29, 31]. In classical logic, the comma contains the full complement of structural rules and both X and Y are allowed to be nonempty. In intuitionistic logic, all structural rules are allowed, but we do not allow the consequent of a consecution to contain more than one formula. In relevant logic, we do not allow weakening: that is, we do not allow the inference from $X \vdash Y$ to $X, A \vdash Y$ or to $X \vdash Y, A$, on grounds of *relevance*. Consider the following proof of the relevantly invalid explosion $A, \sim A \vdash B$:

$$\dfrac{\dfrac{A \vdash A}{A \vdash A, B}}{A, \sim A \vdash B}$$

The relevant logician complains about the *first* step, not the second. A relevantist is happy to infer $A, \sim A \vdash B$ from $A \vdash A, B$, but is *not* happy to infer $A \vdash A, B$ from B.[14] The different logics considered here differ in structural rules, not in our theory of negation.

So, plurality is allowed in the *application* of inference schemes, but the schemes determining the meaning of connectives are unitary.We have another response to the argument that inferential theories of meaning lead us to monism about logical consequence in a given language.[15]

Whatever response we take at this point (and I think that the response in terms of structural rules is the most inviting) we have seen that we can be pluralist while accepting that meaning is conveyed by inferential role.

So, three major considerations about meaning and language identity have been shown insufficient to warrant Carnap's conclusion. Choosing a language is more free than Carnap would have us think. Given a language, considerations of meaning are not sufficient to narrow down the number of consequence relations on that language down to one.

[13] In these proofs, $X \vdash Y$ is read as saying that if everything in X is true, something in Y is true. So, if everything in X and A is true, then something in Y is true, we can infer that if everything in X is true, then either something in Y is true, or $\sim A$ is true.

[14] Of course, this is because of the difference in the way the relevantist and the classicalist treat the form of premise and conclusion combination, here both expressed by the comma.

[15] This can be seen as a version of either of the two responses we have already seen. If you take a scheme to not be an inference, then we agree that the meaning determining rules are not themselves inferences. If, instead, you take the scheme to be its *weakest* instance with the fewest structural rules, then the scheme is a particular set of basic inferences, which may be expanded on by the means of other structural rules.

4 Conclusion

Carnap's Principle of Tolerance is inviting for the pluralist, but it is ultimately unsatisfying. Different accounts of logical consequence need not be restricted to relationships *between* languages. They can also occur *within* languages.

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