Is logic just last in line for the execution?

Logic, holism, and the constitutive *a priori*

Oran Magal
McGill University
ORAN.MAGAL@GMAIL.COM

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Abstract

I argue that Quine's early critique of Carnap's conventionalism is in serious tension with the holism of "Two Dogmas of Empiricism", since his critique of conventionalism makes a compelling case for a privileged status either for logic, or for some other principle by means of which to derive consequences. Based on this, I call for a modification of Quinean holism, on grounds internal to Quine's views. The result motivates a rehabilitation of Carnap's notion of framework principles, and a rethinking of logic as a kind of relativised *a priori*.[1]

[1] Work in progress: please contact the author before citing. This paper was presented at the Early Analytic Philosophy workshop in Indiana-Purdue University, Fort Wayne, March 2013, and I am indebted to participants at the workshop, especially Matt Carlson and Bernd Buldt, for their comments. I am also grateful to Dirk Schlimm for comments on an earlier version of this paper.

1 Introductory comments

Logic and mathematics have long been a challenge for the empiricist tradition. From a non-empiricist point of view, both have traditionally been the very paradigm of *a priori* knowledge. Rudolf Carnap's *Logical Syntax of Language*, published in 1934, was a notable effort to resolve this difficulty within empiricist parameters. However, Carnap's efforts soon came under attack from Quine. Published merely two years after Carnap's book, Quine's article "Truth by convention" (1936) was a scathing attack on Carnap's conventionalist account of logic (which I will summarise below). A few years later, Quine famously challenged the very foundations of logical empiricism in his seminal piece, "Two Dogmas of Empiricism" (1951): There, as it is well known, Quine attacks the very distinction between analytic and synthetic truths, and therefore, of any coherent distinction between content and framework. Under such a view, mathematics and even logic become, albeit indirectly, a matter of empirical truth.

The main argument of this paper is that Quine's thoroughly empiricist position is ultimately untenable, since the line of attack he himself uses against Carnap is directly in tension with the kind of empiricist holism espoused by "Two Dogmas". The aim is not to score points against Quine, but rather to call for a modification of his form of empiricism, and for a re-introduction, at least in a relativised form, of some of the ideas which he sought to stamp out: namely, the idea of logic as a framework, and the return of the *a priori*, though not in its traditional sense.[2] Such a modification of Quine's version of empiricism concerns especially what we may call, for the purpose of this discussion, the

[2] The analysis of "Two Dogmas" according to which its ultimate thrust is a total rejection of the *a priori* follows H. Putnam's, offered in a series of articles (1962, 1976, 1978, 1979).

revisability thesis: according to Quine, in "Two Dogmas" and since, an entire theory or system of beliefs meets 'the tribunal of experience' together; no part of a theory is privileged in any principled way. The only reason why logic and mathematics (and their respective kinds of truth) *appear* to have a different status is a practical reason: it is generally advisable and easier, when our theories conflict with experience and observations, to modify the periphery of the 'web of belief' rather than what lies at its center; but all parts of the holistic web are, in principle, of equal standing. All derive their truth (or falsity) as a 'corporate whole', evaluated by the impartial 'tribunal of experience'. This is a very strong version of the revisability thesis: *everything is, in principle, equally revisable, and for the same reasons*. I will argue that Quine's own arguments against Carnap's conventionalism motivate a withdrawal from this strong form of the revisability thesis. An alternative way to put the point would be that *Quine's holism lacks sufficient structure*, a point I will stress by means of discussing logic, but which arguably applies more generally.

2 What the tortoise said to Carnap

2.1 How to be a conventionalist about logic

Let us begin with a brief account of Carnap's *Logical Syntax of Language* (1934). According to Carnap's "Intellectual Autobiography" (1963), the main motivation for the book was to solve a traditional and pressing problem for empiricist philosophies: how to account for logic and mathematics. The crucial first step was not, in itself, empiricist: it was the Logicist project of eventually reducing all of mathematics to logic, starting with arithmetic

and set theory.[3] If this reduction were to be successful, it would mean that mathematical truths are ultimately logical truths, and therefore analytic, rather than substantive or factual (i.e., synthetic) truths. Carnap's further step in *Logical Syntax* was to argue that logical truth is nothing other than a linguistic convention: a choice of 'syntax', in his terms, for a regimented scientific language.

Let us bracket both the details of the putative Logicist reduction and the prospects for its success. The relevant question is whether logic can be reduced to linguistic conventions. The basic terms, or 'primitives', are a natural starting point: how is the meaning of the logical primitives to be determined, on Carnap's view? For Carnap, this cannot be a question of connotation, or some informal conception of the "meanings" of the terms involved. Rather, he gives an extensional version of the Fregean principle of context: the meaning of the terms we use is to be determined by the truth or falsity of all [sentential] contexts in which they can appear (Carnap, 1934, p. 339).[4]

This seems to leave open an easy route to a definition of truth-by-convention: we could, for each sentential context in which the terms in question can appear, stipulate arbitrarily whether the sentence is true or false. One could think of it as a conventionally-determined list of truths and falsities. If this were possible, it would be an impractical definition to be sure, and rather useless in all but the most rudimentary and limited cases.[5] However, it does *prima facie* offer a method for defining truth by convention. One reason to object to this method of definition is that such a list would lack any clarificatory or explanatory

[3] The Logicist programme in its various forms (e.g., Frege's, Russell's, Carnap's, etc.) eventually ran into serious problems, although there have been recent attempt to revive it, especially by C. Wright and B. Hale. What I wish to defend in Carnap's position is entirely independent of the prospects for Logicism, and so its fate is not an immediate concern.

[4] Page numbers, here and below, refer to the reprinting of this article in Benacerraf and Putnam (1983).

[5] Something like a Wittgensteinian primitive language-game comes to mind as an example.

value; it would simply establish, by fiat, truth and falsity, and demarcate a certain class of terms as logical terms and a class of statements as logical truths (or falsities), without telling us why things stand in this way. Another difficulty is that such a list could only be finite; however, even if we confine our attention to a relatively simple case such as propositional logic, there are (denumerably) infinitely many logical truths to account for, and so no list of them all could be given, just as no list of all the natural numbers could be given.

To be clear: this simplistic conventionalism isn't seriously entertained by Carnap or anyone else. However, it does show what we *would* need, in order to have a *prima facie* theory of logical truth-by-convention: general *schemas* of logical truths, of the familiar form. For example, in classical logic, $p \vee \neg p$, or a schema stating that all instances of *modus ponens* are to be logical truths. We do not need to look far to find such schemata; indeed, why not take the standard axioms of whatever logic is in question, and hold them to be true as a matter of linguistic convention? (That is, hold them to be true, once and as long as you choose to use that logic.) There *is* a sense in which one could do so. Indeed, it is occasionally useful, for certain kinds of logical and mathematical inquiry, to set up a formal system or language with arbitrarily chosen definitions for the primitive terms, as well as arbitrary postulates. It is usually required that such a system be consistent and so on, but otherwise we are normally free to postulate such systems to suit whatever purpose (model-theoretic, proof-theoretic, etc.) we have in mind.

Setting aside quantification, let us consider propositional logic and its four basic connectives, in no particular order: 'and', 'or', 'if-then', 'not'. One does not need all four, technically speaking: once negation and implication are in place, for example, we can use

them to define conjunction and disjunction. So, why not stipulate as a linguistic convention, say: "Let all instances of *modus ponens* be logical truths", and add something similar to take care of negation?Now we come to the Quine's simple but damaging critique of such a proposal.

2.2 Carnap, Baron von Münchhausen?

Consider the following:

> In the adoption of the very conventions [...] whereby logic itself is set up, however, a difficulty remains to be faced. Each of these conventions is general, announcing the truth of every one of an infinity of statements conforming to a certain description; derivation of the truth of any specific statement from the general convention thus requires a logical inference, and this involves us in an infinite regress.
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> In a word, the difficulty is that if logic is to proceed *mediately* from conventions, logic is needed for inferring logic from the conventions. Alternatively, the difficulty which appears thus as a self-presupposition of doctrine can be framed as turning upon a self-presupposition of primitives. It is supposed that the *if*-idiom, the *not*-idiom, the *every*-idiom, and so on, mean nothing to us initially, and that we adopt the conventions [...] by circumscribing their meaning; and the difficulty is that communication of [the conventions] themselves depends upon free use of those very idioms which we are attempting to circumscribe, and can only succeed if we are already conversant with the idioms. (Quine, 1936, pp. 351-2)

To stress the point: the circularity lies in that one needs to make use of logic in order to be able to derive logic from the conventional schemas. Since logic already needs to be in place for the linguistic schemas to be at all useful, linguistic conventionalism cannot be

a full account of logical truth, or of the nature of logic.[6] We can find a vivid analogy for the predicament in which Carnap finds himself, according to Quine, in folklore: the Baron Münchhausen once found himself stuck in a deep hole, we are told, and pulled himself up by his own hair.

We can now return to Quine's holism, and show more clearly the tension between Quine's version of holism and the argument just discussed. Quine's version of holism is a *no-privilege holism*, or a *flat holism*, if you prefer: all beliefs, principles and hypotheses are equal before the tribunal of experience. Logic enjoyed no privileges; it is merely the least practical to revise, under the 'maxim of minimal mutilation'. Or, in other words: logic is not impervious to revision; it is merely the last in line for the execution.[7]

However, Quine's own arguments against conventionalism, as I understand them, establish that there is *at least one* kind of privileged principles: those of logical inference. At least some kernel of elementary rules of inference (*modus ponens* comes to mind) and logical connectives (minimally, negation or something equivalent) must be presupposed prior to any consideration of revision in light of experiences incompatible with our 'corporate body' of beliefs. It may well be that there is more that enjoys such privileged status, but the point for now is that *by Quine's own lights*, these principles as a minimum must be acknowledged as holding a different status. So, in its strict form, the thesis that *every-*

[6] Quine's argument is superficially similar to the point that Lewis Carroll had made in his parable of Achilles and the Tortoise (1895), which Quine even mentions in his article. Without a detailed comparison, for which there is no room here, the similarity is in the threat of an infinite regress in accounting for the nature of logical relations; in Carroll's case, implication. However, Carroll's point is a challenge to *any* account of the foundations of logic, whereas Quine is only concerned with conventionalism. Moreover, Carroll's argument is phrased in psychologistic and temporal terms: in terms of failing to find something convincing, and a never-ending series of steps. I will not pursue this further here.

[7] The situation is reminiscent of a macabre joke: two men are running from a voracious bear. One of them asks the other, "Do you think we could outrun the bear?". The other replies: "I don't think so, but I'm pretty sure I can outrun *you*."

thing is equally, in principle, revisable cannot be upheld. As an aside, one may note that it needn't be logical inference in its standard form which is given this privileged place; but *some* principle of deriving consequences must be given.

3 Logic as relativised a priori

I believe everyone here would agree with the following: scientific inquiry and activity are not conducted randomly, nor arbitratily; they are guided by *some* principles, although any actual attempt to formulate them explicitly will likely evoke a lively debate. Now, *some* of these principles are of the kind that we traditionally call 'logic'. (Please excuse me if I don't attempt the Herculean task of spelling out precisely what does and does not fall under this label.) For Carnap, it should be noted, 'the logic of science' covers much more than what is traditionally called logic: it includes certain aspects of methodology and (non-psychologistic) epistemology, but that need not concern us at the moment.

One possible strategy, following what we just agreed on, is to build an argument based on the general possibility-conditions of science; indeed, one could read such an argument in Kant's *Critique of Pure Reason*, but also, in a more contemporary form, in Quine's so-called *indispensability argument* for 'reluctant' mathematical platonism. Going back to what was discussed earlier, one could also make a similar kind of argument based not on possibility conditions but rather on some argued-for general constraints on translation and interpretation; this is a route often taken by Quine, and in a modified form, by Davidson. In such a way, one might salvage some conception of *a priori*, and although Quine would surely disapprove of calling it '*a priori*', this is what his argument in favor of classical logic

as the one-and-only logic amounts to. There are several difficulties with such strategies; to name one that is immediately relevant: the history of both science and philosophy should have taught us to be extremely careful when we attempt to legislate for all times what future science, or future thought generally, could 'possibly' look like.

Instead, I suggest to turn to a proposal made recently by Michael Friedman in *Dynamics of Reason* (2001), a proposal that has as one of its philosophical ancestors Carnap's notion of 'framework'. The proposal is for a *relativised* conception of the *a priori*, although I should emphasise that Friedman's book focuses on mathematics and certain aspects of physics, rather than logic.[8] The point, at any rate, is that such principles do have a different role – a specifically *constitutive* role, though I haven't been able to address this aspect of the account today – which gives them some of the characteristics of the philosophically traditional *a priori*, without the addition of absolute privilege, epistemic certainty, nor a guarantee that such principles will never be revised or abandoned in favor of others.

To put the point more loosely, in the form of a slogan (it increases the chances that you'll remember what this talk was about ...): *there must always be a logic; but what this logic is must always remain negotiable*. The point I wish to make was what I take to be Carnap's central point in *Logical Syntax of Language*: that the role of logic is not to be part of a scientific theory in the same way that observation sentences and hypotheses regarding natural laws are part of such a theory. Rather, it serves as a framework in terms of which theories can be formulated. As such, one can consider alternatives; one can, if you prefer such language, 'revise' logic, and one can do so for reasons that have to do with a revision of one's overall theory. That this is similar to a Quinean holism is no accident,

[8] There are others who make similar proposals, but this is not the place to go into detail.

since I have been arguing for its modification, not abandonment. The crucial problem which motivates this call for a modification is precisely Quine's deliberate erasure of the line between beliefs or claims on one hand, and principles, e.g., principles according to which inferences are to take place, on the other hand.[9]

There is a peculiarity of logic, one which shows the characteristic based on which I have been arguing for its privileged role even under a holistic account of science, which brings me to a second slogan: *Logic trains and appoints its own replacement*. That is to say, even a drastic proposal to reform our logic (say, a call to revert to intuitionistic logic, or to quantum logic, in certain contexts or generally) would still be part of a discourse and a debate guided, perhaps without it being articulated, by some logic. The set-up and development of alternative logics assumes inferential principles, agreed on and in place at a meta-level relative to the discourse. There is always a logical framework underlying a scientific and mathematical debate, and this, I argue, must be acknowledged even by a thoroughgoing empiricist such as Quine.

To summarise my case: we need to take a step back from Quine's influential version of empiricist holism, and acknowledge the important Carnapian insight regarding the pervasiveness of the notion of 'framework'. Among the fruits of such a position would be an alternative to an implausible, outright rejection of any sort of privileged place for logic, and a position which better does justice to the difference between logical truth and empirical fact. What remains is the considerable task of working out such an account in detail.

[9] Stressing this distinction is the core of Graham Priest's critique of Quine's "Two Dogmas" (Priest (1979)).

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