Frege and Carnap on the normativity of logic

Florian Steinberger

🐎 Springer

Springer

CrossMark

Frege and Carnap on the normativity of logic

Florian Steinberger[1,2]

Abstract In this paper I examine the question of logic's normative status in the light of Carnap's Principle of Tolerance. I begin by contrasting Carnap's conception of the normativity of logic with that of his teacher, Frege. I identify two core features of Frege's position: first, the normative force of the logical laws is grounded in their descriptive adequacy; second, norms implied by logic are constitutive for thinking as such (in a sense to be clarified). While Carnap breaks with Frege's absolutism about logic and hence with the notion that any system of logic should have a privileged claim to correctness, I argue that there is a sense in which Carnap's framework-relative conception of logical norms has a constitutive role to play: though they are not constitutive for the conceptual activity for thinking, they do nevertheless set the ground rules that make certain forms of scientific inquiry possible in the first place. I conclude that Carnap's principle of tolerance is tamer than one might have thought and that, despite remaining differences, Frege's and Carnap's conceptions of logic have more in common than one might have thought.

Keywords Rudolf Carnap · Gottlob Frege · Normativity of logic · Rationality · Normativism about the mental

1 Introduction

In this paper I examine an under-explored aspect of Rudolf Carnap's philosophy of logic, namely the question of the normative status of logic in the light of his famous

✉ Florian Steinberger
    f.steinberger@bbk.ac.uk

1   Birkbeck College, London, UK

2   Munich Center for Mathematical Philosophy, Munich, Germany

principle of tolerance. It is widely held that logic has, in a sense to be specified, normative authority over our thinking. The idea can certainly be found in the works of figures that exercised an important influence on Carnap, Kant and Frege in particular.[1] In order to bring out the originality of Carnap's view on the question, it will prove useful first to examine Frege's conception of the normative status of logic. This will occupy Sects. 2 and 3, where I bring two core features of Frege's conception of the normative role of logic to the fore: first, the normative force of the logical laws is grounded in their descriptive adequacy; second, norms implied by logic are constitutive for thinking as such. In Sect. 4, I explain how Carnap's adoption of the principle of tolerance and, with it, the abandonment of Fregean realism and monism about logic leads him to a form of voluntarism about logical norms: it is we who, by adopting a linguistic framework, invest logic with a normative force that it does not otherwise have. By contrast, I demonstrate in Sect. 5 that, although Carnap does not take logic to issue in constitutive norms for thinking in the same way Frege does, he nevertheless endorses a relativized analogue of Frege's thesis. According to my interpretation, it is constitutive of the very possibility of a system of linguistic representation in which properly truth-evaluable claims can be made that it should be logically structured.

2 Frege's conception of logical laws—the descriptive and the normative

'Like ethics', Frege writes, logic is a normative discipline (Frege 1897, p. 226). Its aim is to lay down the laws of thought. However, there is an ambiguity in the phrase 'law of thought' that is apt to give rise to pernicious psychologistic misunderstandings, and so calls for immediate clarification. As we will see, the meaning of 'law' in that phrase of crucial importance. Before turning to the task of clarifying 'law', though we do well to say a few words about how 'thought' is to be understood in this context.

'Thought' is systematically ambiguous in English between the mental acts, events or states that constitute thinking (judging, inferring, believing, supposing, etc.) and the objects or contents of those acts and states (in the present case, Fregean *Gedanken*, i.e. the senses of sentences and primary truth-bearers—(Fregean) propositions, in modern parlance). Norms apply to practices or activities. Thus, only thoughts in the former sense can meaningfully be regarded as proper subjects of normative appraisal. And so when we speak of logic being normative for thought or thinking, 'thought' is to be understood in this former sense—roughly, as the conceptual activity through which we form and revise beliefs (*cf.* MacFarlane 2002, p. 35, fn. 16). That being said, Frege sometimes uses 'thinking' not as an umbrella term for mental acts and states such as judging, supposing, believing, etc., but rather as a particular such act. For instance, Frege writes that from the laws of logic 'there follow prescriptions about asserting, thinking, judging, inferring? (1918, p. 325). 'Thinking' in this narrower sense designates the act of apprehending or grasping a thought (or proposition) (Frege 1918, p. 294) without thereby taking a stance on its truth-value. As MacFarlane correctly notes,[2]

---

[1] Though see Tolley (2006, 2008) for critical discussion of the supposed normativity of logic in Kant.

[2] I am grateful to an anonymous referee for raising the same point, and so helping me to appreciate the need to clarify this issue.

it is hard to see how the laws of logic could provide norms for thinking in this sense. The principle of non-contradiction does not imply that we ought not *grasp* contradictory thoughts: indeed, sometimes we must grasp such thoughts, when they occur inside the scope of a negation or in the antecedent of a conditional (Frege 1924, 50). Thus, it seems most reasonable to take Frege's talk of norms for thinking as talk of norms for judging. Norms for thinking, in this sense, will include norms for inferring, which for Frege is simply the making of judgments on the basis of other judgments (MacFarlane 2002, p. 36, fn. 18).

For example, it is clear that 'thought' and 'thinking' are to be understood in this broader sense when Frege observes that 'thinking as it actually takes place is not always in agreement with the laws of logic' (cited in Taschek 2008, p. 381) or when he writes that the laws of logic 'prescribe universally how one should think if one is to think at all' (Frege 1893, p. xv). His phrase 'if we call [the laws of logic] laws of thought, or, better, laws of judgment' (cited in Taschek 2008, p. 381) makes it clear that this what is meant.

Turn now to the task of clarifying 'law' as it appears in 'laws of thought'. In a well-known passage in the Preface to the first volume of his *Grundgesetze der Arithmetik*, Frege seeks to forestall such misapprehensions by distinguishing two senses of 'law':

> In one sense [a law] states what is, in another sense it prescribes what ought to be. It is only in the sense in which they lay down how one ought to think that the logical laws may be called laws of thought (Frege 1893, p. xv).

Following Frege, we can thus distinguish the following two types of laws:

- Laws with a **descriptive dimension** have law-to-world direction of fit. They describe 'certain regularities in the order of things—typically those with high explanatory value or counterfactual robustness' (MacFarlane 2002, p. 35), as in the case of the laws of nature. Consequently, laws descriptively understood cannot be violated, as any genuine exception to a would-be law would strip it of its status of (descriptive) law.[3]
- Laws with a **prescriptive dimension** have world-to-law direction of fit. They 'prescribe what one ought to do or provide a standard for the evaluation of one's conduct as good or bad' (MacFarlane 2002, p. 35). Therefore, prescriptive laws can be violated as in the case of legal or moral norms or of rules of etiquette.

Seeing that the passage just quoted precedes one of Frege's most virulent anti-psychologistic diatribes, it is tempting to read Frege's distinction between descriptive and prescriptive laws as doing double duty as a means of demarcating logic from psychology. The all-important distinction between the disciplines of psychology and logic, the thought goes, parallels the distinction between the two types of laws of thought. Both disciplines are in the business of laying down laws of thought, but in crucially different ways. Psychology, being an empirical science, seeks to produce

---

[3] As the definition suggests, descriptive laws are generally in the business of describing reality and so are, *prima facie* at least, answerable to facts. This is not to say that descriptive laws are necessarily empirical and metaphysically contingent. Frege took the laws of logic to be descriptive and yet necessary.

systematic generalizations describing the cognitive behavior of average reasoners in a given population—its concern is with the laws of thought *descriptively* understood. Logic, by contrast, lays down the canons for correct reasoning—its concern is with the laws of thought *prescriptively* understood. The distinction between psychology and logic, on this picture, boils down to a straightforward is-ought distinction: psychology tells us how we do in fact think; logic tells us how we ought to think.[4]

But this portrayal grossly over-simplifies Frege's actual position. For while logic certainly does have a normative role to play in our rational economy on his view, logic is not merely, and indeed not primarily, normative. Rather the laws of logic are 'generalizations that set forth what is' and as such are firmly anchored in and beholden to an objective reality (Ricketts 1996, p. 127). Like the laws of psychology, biology and physics, the laws of logic are first and foremost *descriptive* in that they are responsible to how things stand in the world.[5] The following passage makes this plain:

> [t]he word 'law' is used in two senses. When we speak of laws of morals or the state we mean regulations which ought to be obeyed but with which actual happenings are not always in conformity. Laws of nature are the generalization of natural occurrences with which the occurrences are always in accordance. *It is rather in this sense that I speak of laws of truth* (Frege 1918, p. 289; my emphasis).[6]

But what are the laws of logic descriptive of ? For Frege the

> logical laws are maximally general truths, substantive generalizations that are 'about reality' in the same fashion that the laws of geometry, physics and chemistry are' (Ricketts 1996, p. 123).[7]

---

[4] Passages like the following reinforce this (as we will see) erroneous interpretation

> If we call [the laws of logic] laws of thought, or, better, laws of judgment, we must not forget we are concerned here with laws which, like principles of morals or laws of the state, prescribe how we are to act, and do not, like laws of nature, define the actual course of events. Thinking, as it actually takes place, is not always in agreement with the laws of logic any more than people's actual behavior is always in agreement with the moral law (cited in Taschek 2008, p. 381).

[5] As Peter Sullivan points out, this explains why Frege deems it appropriate to present logic axiomatically:

> in adopting [the axiomatic] model Frege was according to logic the status of a science, […] this marks a distance between his conception and those both from his most important predecessor, Kant, and his most important successor, Wittgenstein' (Sullivan 2004, p. 682).

[6] The 'laws of truth' is just another name for the laws of logic for Frege. See Taschek (2008) for an illuminating discussion of the role of truth in Frege's conception of logic.

[7] Frege himself is very clear about this point. See e.g. (Frege 1893, p. xv). See also Warren (Goldfarb 2010, p. 69), who writes that 'for Frege […] it is […] reality that obeys the laws of logic'. Still, the claim that Frege's laws of logic are descriptive of reality in something like the way the (correct) laws of the natural sciences might be said to be calls for further commentary. Frege's laws of logic in fact are about both material or physical reality, as well about abstract, non-temporal, non-spatial, causally inert things, which have their home in what Frege calls the 'third realm' (the remaining realm being that of mental entities). In our example, Basic Law IIa clearly quantifies over all objects and all concepts. Many objects (excepting numbers and other abstract objects) occupy the realm of reference. On the other hand, concepts, for Frege, are functions and so are denizens of the third realm, alongside thoughts and other abstract objects. There are, of course, important differences between these two realms (some of which have already been brought

But if the logical laws are, in this sense, on a par with the laws of the special sciences, how can they still be said to be normative? This might strike us as especially puzzling because the logical laws are not explicitly prescriptive 'as regards their content' (ibid.): they do not contain deontic vocabulary, and they are not formulated in the imperatival mood. Frege's Basic Law IIa $\forall F \forall x (\forall y F(y) \rightarrow F(x))$ (Frege 1893, Sect. 20), for instance, does not wear its normative import on its sleeve. It is simply a universal claim about all concepts and all objects: if a concept holds of all objects, it will also hold of the object in question. As MacFarlane puts it, in the statement of the law 'there are no *oughts* or *mays* or *musts*: no norms in sight!' (MacFarlane 2002, p. 35).[8]

Wherein, then, *does* the normativity of logic reside? The answer is that while the laws of logic are not explicitly prescriptive, they nevertheless *issue prescriptions*. In Frege's words,

> from the laws of [logic] there follow prescriptions about asserting, thinking, judging, inferring' (Frege 1918, p. 325).

More precisely, a law of logic implies the prescription to conform one's thinking to the law in appropriate ways.[9] Consequently, the laws of logic issue in *both* descriptions *and* prescriptions. The descriptive laws they give rise to concern the most general 'regularities in the order of things'; the prescriptive laws set standards of correctness to which our thinking is answerable, and which we can fail to live up to.[10] The prescriptive aspect of logical laws is therefore *directly consequent upon* their descriptive adequacy: it is because the laws of logic accurately depict how things stand objectively, that we ought appropriately to align our thinking with them. As such, the normativity of logic distinguishes itself markedly from conventional prescriptive laws: the laws of logic are not socially instituted or in any other way the product of human doings, whether deliberate or somehow guided by an invisible hand process. The logical norms simply emanate from the immutable logical laws, the

---

Footnote 7 contiuned

out by our characterization of the two realms). However, I contend that the differences are immaterial to the claim that I am making: namely, that the laws of logic are descriptive of these objective realms. And both realms—the realm of material things and that of immaterial abstract things—are objective for Frege in the sense that neither is 'intrinsically borne by a mind, as a pain or an after image is' (Burge 1992, p. 637). As for the metaphysical status that Frege ascribes to the third realm, interpreters have differed. For instance, 'literal' interpretations take Frege's realist talk about the 'third realm' at face value (e.g. Burge 1992). Opposed to such realist interpretations, are views which favor a broadly idealist/practice-dependent construal of the third realm (e.g. Weiner 1995). To the extent to which logical laws are also about the third realm, the latter type of interpretation may be thought to put some pressure on my talk of Fregean realism about logic. However, even on Weiner's view the third realm is objective at least in the sense that its existence is independent of our actual practices. My main point, that for Frege the normativity of logic is grounded in its descriptive adequacy with respect to an (even minimally) objective realm of things, remains unscathed.

[8] The example of Basic Law IIa is also borrowed from (MacFarlane 2002).

[9] 'Appropriate ways' is a necessary qualification, because the connection between logical rules and norms of belief regulation is not always straightforward. The reasons for this are familiar from Gilbert Harman's work (Harman 1986). I am assuming here without argument that some such connection nevertheless exists, see (Field 2009) and (MacFarlane 2004) for discussions.

[10] It is in this latter sense that passages like the one quoted in footnote 4 above are to be understood.

> boundary stones fixed in an eternal foundation that our thinking can overflow but never displace (Frege 1893, p. xvi),

as Frege memorably put it.

But Frege does not take this dual status—being simultaneously descriptive and prescriptive—to be peculiar to logical laws. The feature is common to all scientific laws.

> Each law that states what is can be conceived as prescribing that one ought to think in accord with it, and so, in this sense, is a law of thought. This holds no less for geometrical and physical laws than for logical ones (Frege 1893, p. xv).[11]

The ensuing picture might be summarized as follows. The correct laws of physics adequately describe portions of reality.[12] As such they set standards of correctness for our thinking with respect to the physical arena; if we want to judge, believe and infer truly about the physical world, we had better align our thinking with the laws of physics. Similarly, it is because logic correctly describes certain features—the most general features—of reality that we *ought not* to think in ways contrary to its laws. In this sense, the laws of physics and the laws of logic have both descriptive and prescriptive dimensions. Nevertheless, as norms, these laws differ from *merely conventional* prescriptive laws because only the former are, as it were, anchored in an objective reality.

3 Frege's constitutivity thesis

Given what we have said so far, one would be warranted in concluding that the normativity of logic is *of a kind* with that which attaches to the laws of the particular sciences. If there is anything that sets the normativity of logic apart, the difference would seem to consist in the scope of its normative import: while the laws of physics, bio-chemistry or geology are confined to a particular domain of inquiry, logic is characterized by its 'maximal generality'—its task is that of

> saying what holds with the utmost generality for all thinking, whatever its subject matter (Frege 1897, p. 228).

---

[11] In a very similar vein, Frege writes

> we could with equal justice think of laws of geometry and of physics as laws of thought or laws of judgment, namely as prescriptions to which our judgments must conform in a different domain if they are to remain in agreement with the truth (cited in Taschek 2008, p. 466).

[12] 'Laws of physics' could be taken in either of two senses here. It could refer to the *true* (actually obtaining) laws of physics in which case the standard of correctness would be alethic. They could also refer to the laws postulated by our best current scientific theory, in which case the standard of correctness adverted to would be epistemic in nature (cf. MacFarlane 2002, p. 37, fn. 19). It is pretty clear, it seems to me, that Frege conceived of the laws of physics in the former sense (e.g. Frege 1897, p. 133), but this matters little for our purposes. Whatever Frege's stance on the laws of physics, there can be no doubt, as we have seen in the passage likening the laws of logic to an 'eternal foundation', that the *logical* laws have the status of objective and immutable laws of truth which are what they are quite independently of our capacity correctly to identify them.

However, some authors have made the case that Frege conceived of the normativity that attaches to the laws of logic as being characterized by a distinctive kind of oomph, over and above their universality. It is by virtue of this special distinguishing feature, they maintain, that the laws of logic enjoy a 'proprietary claim to the title "laws of thought", conceived normatively' (Taschek 2008, p. 383). The crucial extra feature in question is that the laws of logic are *constitutively* normative for thought as such, i.e. thinking about any subject matter at all.[13]

Saying that logic is constitutively normative for thought amounts to the claim that for an activity to count as thinking it must be 'assessable in the light of the laws of logic' (MacFarlane 2002, p. 37). In other words, for mental acts or states of a particular agent to count as acts or states of thinking—to count as judgments, inferences or beliefs, say—the agent must be appropriately sensitive to the laws of logic.[14] Were a creature to fail, persistently and systematically, to display the requisite sensitivity to the logical strictures, we would not be able to recognize it as a thinking being at all.

The relevant contrast here is that logic is not merely normative in a *regulative* sense, but in a *constitutive* sense.[15] Let me elaborate. The distinction between regulative and constitutive norms or principles is Kantian at root (KRV A179/B222). Here, however, I refer primarily to John Searle's way of drawing it. According to Searle, regulative norms 'regulate antecedently or independently existing forms of behavior', such as rules of etiquette or traffic laws. Constitutive norms, by contrast

> create or define new forms of behavior. The rules of football or chess, for example, do not merely regulate playing football or chess but as it were they create

---

[13] I do think this interpretation of Frege has a lot going for it. And I will assume it in the following. However, even if it turns out that it does not ultimately stand as a matter of Frege scholarship, it nevertheless provides a useful foil for the discussion of Carnap's conception of the normativity of logic.

[14] This interpretation of Frege's conception of the normativity of logic has been pushed most forcefully by MacFarlane (2000, 2002) and Taschek (2008). But the central idea seems to me to be endorsed more or less explicitly by a number of authors. To give just one example, Michael Friedman writes,

> The principles and theorems of the Begriffsschrift are implicit in the requirements of any coherent thinking about anything at all, and this is how Frege's construction of arithmetic within the Begriffsschrift is to provide an answer to Kant: arithmetic is in no sense dependent on our spatiotemporal intuition but is built in to the most general conditions of thought (Friedman 1999c, p. 167).

This interpretation also bears some resemblance to the tradition of Frege interpretation originating with Burton Dreben and Jean van Heijenoort (and which has gained significant influence in the writings of Ricketts and Goldfarb among others). Central to this tradition is the notion of 'logocentrism', the idea that for Frege there is no extra-logical vantage point to be had, and in particular that there is no possibility of a meta-linguistic stance in the contemporary. In the absence of such an external standpoint, we cannot speak, on Frege's picture, of the relation between language and that to which it refers. This, in turn, is supposed to lead us to reassess Frege's apparent realist commitments. See Sullivan (2004) for an illuminating critical discussion of this tradition. Though the logocentrist tradition is of course related to the present project, its aims are importantly different. Our (rather more narrow) focus is squarely on the project of developing and comparing the constitutivist accounts of the normativity of logic that can be found in Frege and Carnap. No such position is suggested, let alone implied by the logocentrist tradition. I am grateful to an anonymous referee for pressing on this point.

[15] Much of this discussion is inspired by Clinton Tolley's (2006) insightful discussion of the normativity of logic in Kant. Our main difference is that Tolley thinks that constitutive principles cannot carry normative force; I believe they can. A full discussion would lead us too far afield.

the very possibility of playing such games' (Searle 1969, p. 33–34), see also (Searle 2010, p. 97).

Take the case of traffic rules. While I ought to abide by the traffic rules, I can choose to ignore them. Rowdy driving in violation of the traffic code might well result in my losing my license. Yet no matter how cavalier my attitude towards traffic laws is, my activity still counts as driving. Contrast this with the rules governing the game of chess. I cannot in the same way opt out of conforming to the rules of chess *while continuing to count as playing chess*; in systematically violating the rules of chess and persisting in doing so even in the face of criticism, I forfeit my right to the title 'chess player'. Unless one appropriately acknowledges that one's moves are subject to the rules of chess, one's activity does not qualify as playing chess. According to the reading of Frege we are considering, the laws of logic are to thought what the rules of chess are to the game of chess: I cannot fail to acknowledge that the laws of logic set standards of correctness for my thinking without thereby jeopardizing my status as a thinker. In this sense, the laws of logic create the very possibility of conceptual activity. As Frege puts it: 'the laws of logic prescribe universally how one should think *if one is to think at all*' (Frege 1897, p. xv; my emphasis).

This reading of Frege according to which the logical laws enjoy a distinctive kind of normativity—a constitutive normativity—is supported also by a number of further passages, as for example in his argument for the fundamental difference in nature between arithmetic and geometry in *Grundlagen der Arithmetik*, namely that the former is while the latter is not analytic.

> For purposes of conceptual thought we can always assume the contrary of some one or other of the geometrical axioms, without involving ourselves in any self-contradictions when we proceed to our deductions, despite the conflict between our assumptions and our intuition. The fact that this is possible shows that the axioms of geometry are independent of one another and of the primitive laws of logic, and consequently are synthetic. Can the same be said of the fundamental propositions of the science of number? Here, we have only to try denying any one of them, and complete confusion ensues. Even to think at all seems no longer possible. The basis of arithmetic lies deeper, it seems than that of any of the empirical sciences, and even than that of geometry. The truths of arithmetic govern all that is numerable. This is the widest domain of all; for to it belongs not only the actual, not only the intuitable, but everything thinkable. Should not the laws of number, then, be connected very intimately with the laws of thought? (Frege 1884, Sect. 14)

Frege's argument in this passage plainly relies on the assumption that logic is constitutive for thinking. It is because he presupposes that upon renouncing a logical law 'complete confusion' would immediately 'ensue' that Frege can argue for the analyticity of arithmetic on the basis that the denial of any of its axioms would equally render thought impossible altogether.[16]

---

[16] It should be noted that Frege's observation is not entirely correct. For instance, the denial of the axiom of induction is known to be consistent with the remainder of the Peano-Dedekind axioms.

The preface to the first volume of his *Grundgesetze* points in the same direction. In a famous passage, Frege imagines being confronted with creatures whose judgments and assertions would be in no way regulated by the logical laws. Illogical creatures of this kind would be utterly unintelligible for us. In Frege's words, we would have encountered a hitherto unknown kind of madness (Frege 1893, p. xvi). The novelty of this type of madness, presumably, resides in the fact that it does not consist in a departure from or subversion of our ordinary modes of thinking, but rather that the creatures in question could not properly be said to be engaged in anything resembling conceptual activity at all. For partaking in conceptual activity presupposes manifesting at least a minimal sensitivity to logical strictures. It is in this sense, then, that the previous passage of Frege's that 'the laws of logic prescribe universally how one should think *if one is to think at all*' (idem, p. xv) is to be understood.

We might summarize the interpretation we have been considering as committing Frege to the

- **Constitutivity Thesis (CT):** Logic provides constitutive norms for thinking as such.

It bears emphasis that attributing CT to Frege is *not* to saddle him with the view that in order to think at all one's thinking must at all times conform to the logical laws. Such a view would make logical error in our thinking impossible; in committing a logical blunder, my mental activity would *ipso facto* cease to qualify as thinking. Frege explicitly rejects this view on a number of occasions, e.g.:

> Thinking, as it actually takes place, is not always in agreement with the laws of logic any more than people's actual behavior is always in agreement with the moral law (Frege 1897, p. 228).

According to our interpretation of CT above, all that is required to qualify as a thinker, i.e. a being that judges, infers, has beliefs, etc., is that one takes one's mental acts and states to be evaluable in the light of the laws of logic. That is, although one may at times (perhaps even frequently and systematically) stray from the path prescribed by logic in one's thinking, one nevertheless counts as a thinker so long as one appropriately acknowledges logic's normative authority over one's thinking. Consider again the game of chess. It seems plausible that I might violate the rules of chess, deliberately or out of ignorance, and still count as playing chess, so long, at least, as I acknowledge that my activity is answerable to the rules, for example, by being disposed to correct myself when the illegal move is pointed out to me.[17] Similarly, all that is necessary to count as a thinker is to be sensitive to the fact that my practice of judging, inferring, believing, etc., is normatively constrained by the laws of logic. It is not easy to specify, in any detail, what the requisite acknowledgment or sensitivity consists in. William Taschek proposes that acknowledging

> the categorical authority of logic will involve one's possessing a capacity to recognize—when being sincere and reflective, and possibly with appropriate

---

[17] Similar points are made by MacFarlane (2002, p. 37) and Taschek (2008, p. 384) in the case of thinking, and by Williamson (1996 p. 491) in the case of speaking a language and performing assertions.

prompting—logical mistakes both in one's own judgmental and inferential prac-
tice and that of others (Taschek 2008, p. 384)

Importantly, it is not necessary for the agent in order to have the requisite sensibility
to be able explicitly to represent the laws of logic to herself.[18] Clearly, a full account
would require filling in a number of blanks here, but for our purposes Taschek's sketch
will serve just fine.

As we have seen, to say that logic issues in constitutive norms for thinking is to
say that a being that fails appropriately to acknowledge the strictures of logic cannot
be correctly ascribed the types of states and episodes that constitute thinking. Frege is
thus making a substantive claim about the nature of certain mental states and events:
the claim, namely, that it is essential to the conceptual activity of thinking that it should
be constrained by norms of logical cogency in a particular kind of way.

We might try to understand this thesis as follows. There are presumably several
distinct levels at which we can describe our mental life. Frege, on this interpretation, is
making the claim that the boundary between the kinds of mental activity that constitute
thinking, on the one hand, and other kinds of mental activity (non-conceptual activity
like being in pain, for instance), on the other hand, is a boundary between those mental
activities that are characterizable in terms of their constitutive norms and those that are
not. This is not to deny that much can be learned about thinking and other processes
through descriptions that operate at different, non-normative levels—the 'symbolic' or
the neurological level of description, say. The claim is merely that if we are interested
in demarcating conceptual activity from other types of mental phenomena, we should
look to the constitutive norms governing it. In this sense, Frege might be viewed as a
precursor of contemporary forms of 'normativism about the mental': views according
to which any account of intentional states must make ineliminable appeal to the norms
that govern them.[19] For instance, consider the view that a form of the truth norm is
constitutive of belief. What makes a belief a belief is that it aims at the truth. And one
way of spelling out the content of that metaphor is via the *truth norm*: For all subjects
S, for all propositions A: if S considers or ought to consider A,

<p style="text-align:center">S ought to believe A if and only if A is true.</p>

Not unlike Frege (on the interpretation of Frege defended here), advocates of the
truth norm are typically normativists about beliefs: they maintain that an appropriate
account of what makes a belief a belief as opposed to some other mental state, and
hence what makes it meaningful to speak of beliefs in the first place, is an account of
the norms that are essential to believing. Frege's CT is comparable but targets a rather
more general activity, that of thinking.[20]

So much for Frege's account of the normativity of logic. Before turning to Carnap,
however, let us briefly take stock of our findings up to this point. These are the two
pivotal features of Frege's conception of the normativity of logic.

---

[18] Again the comparison with Williamson (1996) on the constitutive norms of assertion is telling.

[19] See e.g. Wedgwood (2006) and Zangwill (2005).

[20] The notion that CT (or variants of it) might be directed towards different target activities, will play a
central role in Sect. 5.

1. Logic issues in laws that are both descriptive and prescriptive. The relation between the two aspects is such that the normative force of the laws of logic is grounded in their descriptive adequacy. Hence, we ought to align our thinking with the logical laws precisely because they afford an accurate representation of the most general features of reality. Frege's account of the normativity of logic is thus intimately connected with his monism and realism about logic: there is one true logic and that logic issues in substantive generalizations that are answerable to an objective reality. It is in virtue of its descriptive adequacy that logic exerts normative force on our thinking.
2. The laws of logic have a special normative status because they give rise to norms that are constitutive (as opposed to merely regulative) for our practices of judgment, inference and belief: an activity can count as thinking only if it is assessable in the light of the logical laws.

4 Carnap's voluntarism

So much for Frege's view of the matter. How, in light of our previous discussion, should we characterize Carnap's view of the normativity of logic? The obvious starting point is Carnap's dramatic departure from Frege's conception of the nature of logic. In what has been hailed as Carnap's 'most original and fundamental philosophical move' (Friedman 1999a, p. 169), Carnap abandons the 'absolutist' conception of logic—the notion that there is but one true *L*ogic. In one fell swoop, Carnap jettisons both Frege's realism and his monism.[21] Logic is not in the business of describing reality. Therefore, its laws lack any *descriptive dimension*; they are not answerable to an external standard against which they could be judged to be true or false, correct or incorrect. Nor, therefore, can the legitimacy of the resultant norms be grounded in the correctness of the system from which they flow. Indeed, for Carnap the question of 'correctness' cannot even be meaningfully asked when it comes to logical systems. All logical systems are prima facie equal. Carnap's well-known *laissez-faire* attitude with regard to this question is enshrined in his celebrated *principle of tolerance*, according to which

> 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 (Carnap 1937, Sect. 17).

We are thus 'entirely free' ('*völlig frei*') (idem, p. xiv) to devise any logical framework we please so long as, in doing so, we comply with Carnap's exacting standards of precision. In the absence of standards of external correctness, it is *we* who choose

---

[21] Admittedly, the formulation here is somewhat misleading as to Carnap's actual intellectual development. It is really Wittgenstein's universalism (not Frege) that occupies Carnap most in the period when he first conceives of the principle of tolerance. See Friedman (1999b) and Awodey and Carus (2009) for helpful accounts of Carnap's thinking around this time. My presentation may be excused in the context of this comparative project.

logical systems, and we do so on pragmatic grounds: we adopt those logical systems that best serve our theoretical ends.[22]

The upshot of this radical break with Frege's realism and resulting monism for Carnap's conception of the normativity of logic is immediate. Whatever normative status logic may enjoy on Carnap's view, it cannot be *grounded* in descriptive adequacy, as it is for Frege. On Frege's view, the laws of logic issue in prescriptions about how we should think *as a result of* their status as universal truths—the normativity of the logical laws, we noted, is directly consequent upon their descriptive adequacy. The ensuing norms are norms that we, *qua* thinking agents, are inevitably answerable to. They do not require our approval or acceptance in order to be norms for us. In contemporary jargon we might say that on Frege's view the normative facts supervene on the logical laws.[23], normative or not (Frege 1918). Being normative facts these facts rely on the existence of beings whose activities and practices are sensitive to them in order to exert normative force. Nevertheless, these facts are objective and mind-independent.

Not so on Carnap's wholly different conception of the nature of the norms. According to Carnap, *we* are the ones who elect a system of logic. It is by endorsing a system that we invest it with a normative force that it would not otherwise have. We choose to hold ourselves and our peers accountable to the rules set out by the selected logical system, and we do so because we judge that doing so serves our theoretical ends. Carnap's principle of tolerance thus is accompanied by a voluntarism about logical norms: logical norms are *self-imposed*. Perhaps we could say that Carnap sets out a positivistic conception of logical norms in opposition to Frege's 'logical jus naturalism'.

5 Carnap's relativized constitutivity thesis

Let us turn now to the second feature of Frege's conception of the normative status of logic, CT; i.e. the idea that logic sets constitutive norms for all thinking. Is the Carnapian conception that has begun to emerge in the last section compatible with CT? The short answer is that it cannot be. At least not in quite the same way. For even our sketchy characterization of CT makes it clear that an activity governed by constitutive norms—in this case the 'activity' of thinking—cannot simultaneously be governed by two or more sets of extensionally distinct constitutive norms.

To see this, suppose we had two extensionally distinct sets of norms N_1 and N_2 both of which are assumed to be constitutive of some activity A.[24] Suppose that according

---

[22] Carnap's conception of logic, we must not forget, is rather more encompassing than what most contemporary authors would be comfortable with. This is not to say, of course, that there is currently anything like a consensus about what falls under the remit of logic. All the same, most would nowadays shirk from lumping together inference rules for the standard connectives and the axioms of induction and of choice under the heading of 'L(ogical)-rules', as Carnap does (Carnap 1937, Sect. 30).

[23] My talk of normative facts should be taken with a grain of salt and is obviously not offered as an interpretation of Frege in any strict sense. As is well known, Frege rejected any metaphysics of facts in the sense of correspondence theory of truth

[24] Notice that two extensionally equivalent norms may be intensionally distinct (e.g. 'you ought to take the sum of x and 1 and then multiply the result by 2' and 'you ought to multiply x by 2 and multiply 1 by 2 and then add the products' are intensionally distinct norms that are extensionally equivalent because

to N_1 but not N_2 one must ϕ in order to count as Aing. Well, if N_1 really is constitutive of A, then I cannot A unless I appropriately take my actions to be answerable to N_1. In particular, my failure to ϕ jeopardizes my status as an Aer, unless I am disposed readily to correct myself and to proceed to ϕ once I become aware of my violation (or at least appropriately acknowledge my transgression as such). That, as we have seen, is just what it means to A: to acknowledge that my actions are to be evaluated by the standards set by N_1, in particular the injunction to ϕ. But in the scenario we are imagining A is equally governed by N_2, a set of norms that does not include the injunction that one must ϕ, but which, *ex hypothesi*, is equally constitutive of A. Hence, so long as my actions are suitably responsible to N_2, I am exempt from ϕing while nevertheless counting as Aing. But this means that N_1 is not constitutively normative of Aing after all, contradicting our initial assumption.

If this is right, it should be true in particular in the case of logic and thought: thought cannot be normatively constituted by two distinct sets of logical norms. Given that no two extensionally distinct logical laws can give rise to the same set of norms, it follows that thought is governed by a unique set of logical laws by the standards of CT. In short, CT entrains a commitment to logical monism in the sense that there can be but one constitutive norm-setting logic. But this means that CT is incompatible with Carnap's logical pluralism.

But it seems too quick to dismiss the notion of a tolerance-tolerating variant of CT. The following analogy stirs us in the right direction. Arguably, the rule of law is a constitutive condition for a state's (in the political sense) being just. But the rule of law can be realized in multiple ways. It can be realized in different types of legal and constitutional frameworks and can be upheld by various kinds of political and judicial institutions. All that matters is that the state and its legislative and judiciary branches conform to certain standards (e.g. that the law be clearly stated, public, prospective, applicable to all and, on a 'thick' reading of 'rule of law', that it protect a certain number of rights, etc.). The idea, then, is that there are a number of different legal frameworks all meeting the appropriate standards, but there is no single framework the adoption of which would be *necessary* to guarantee the rule of law. For a state to be just it is necessary that it adopt *some* suitable legal framework satisfying the aforementioned standards, but it does not matter much which. (In practice, of course, it might matter a great deal because certain systems and types of institutions are preferable to others in a given situation, but we may ignore these complications here.)

Put schematically: what we are imagining is an activity or practice governed by what we might dub a *disjunctive constitutive norm*. Consider again the case of Aing. For Aing to be governed by a disjunctive constitutive norm means (in the simplest case involving only two sets of constitutive norms) that in order to count as Aing one's actions must be governed by either of the extensionally distinct sets of norms N_1 *or* N_2 (though not both). Hence, Ann and Bob might both A even though Ann might be

---

normatively constrained by N_1 and Bob by N_2. It would be wrong to say of either N_1 or N_2 that only they are constitutive of Aing. What is constitutive of Aing is that one acknowledges the force of one of N_1 or N_2 on one's actions in the right kind of way.

Most games are not like this. One is not given distinct sets of rules and told that in order to play the game one must abide by one (and only one) of those sets. In some games, however, there may be variations on rules that have this sort of disjunctive effect. For example, there are different schools when it comes to casual pool playing (though not of course at the level of official competition). According to some, the eight ball can be potted in any hole provided the player announces the hole prior to the shot; according to others, it must be potted in the hole directly opposite the ball last potted, etc. Another example is whether to allow castling or not in chess.[25] Our attitude towards this, presumably, is that one counts as playing pool no matter which of the rules one adopts. All that matters is that the players in a particular game agree on the rules in force.

But could thought be like this? Might it be constitutive of thought *not* that there is a unique set of logical norms to which thinking is subject, but rather that the thinker acknowledge the normative authority of one set of logical laws among a range of different but equally acceptable options? According to this picture there are more than one, potentially numerous, sets of norms. None of them has an exclusive claim to being constitutive for thought, but in order to count as thinking one must acknowledge the authority of exactly one (any one) of them. This leads us to a weaker version of CT. Call it *relativized CT* (and the Fregean position entertained thus far: *strict CT*). Logic could then be said to be constitutively normative in this relativized sense if it is essential to thought that it be responsible to *some* logical norms. What distinguishes relativized CT from strict CT is that there is no *single* logical consequence relation with a claim to laying down *the* norms of all thinking. There are several consequence relations, each of which gives rise to the logical norms potentially constitutive of thought. For that potentiality to be realized the corresponding logical framework would have to be selected. We might imagine, for instance, that all Dutch people operated on the basis of intuitionist logic, while the rest of the world favors classical logic. Both the Dutch and everyone else would count as thinking, they would just think differently, logically speaking. On this view, thought, much like the rule of law, is characterized by its *multiple normative realizability*.

How does Carnap fit into this picture? Well, he certainly does not appear to make an analogous claim about the nature of the states and events that comprise thinking. And yet there is a sense in which Carnap can, and indeed does, coherently hold both tolerance and a weakened, relativized version of CT. What sense is that? Well, one's chosen logico-linguistic framework *does* set norms, constitutive norms even, but these norms are not constitutive of thought understood as the psychological activity of individual agents. Rather, linguistic frameworks in Carnap's sense *set standards of correctness that make truth-evaluable claims first possible*.[26]

---

[25] I am grateful to an anonymous referee for the example.

[26] As can be gleaned from some of the quoted passages, a number of authors have noted the constitutive role played by linguistic frameworks in Carnap's thought (Creath 2007; Friedman 1999a; Richardson 2007; Ricketts 2007). My aim here is to develop these observations into a full-fledged account of Carnap's

The idea is this. A language or linguistic frame is a vocabulary along with a set of formation rules and a set of transformation rules. It is the job of formation rules to determine which grammatical constructions are permissible. It is the job of the transformation rules to specify which types of inferential moves are permissible. Transformation rules fall into logico-mathematical *L-rules* and (possibly) extra-logical *P(hysical)-rules*, which embody principles involving *descriptive* (as well as *logical* vocabulary).[27] The L-rules generate a relation of logical consequence, they set out the ground rules that

> define standards for the acceptance and the rejection of sentences and theories formulated within the calculus and [so define the] standards for a language-relative notion of cognitive correctness (Ricketts 2007, p. 206).

How does this work? Linguistic frameworks are evaluated on the basis of their potential to serve as suitable (local or global) languages of science. In order for a linguistic framework to perform this function, it must be 'coordinated' with our sensible experience by identifying (or adding, if need be) a descriptive vocabulary that includes observation predicates (O-predicates). The descriptive vocabulary receives its meaning from the P-rules that govern it and from its logical connections with the O-predicates. Rather than assuming, as Frege did, a pre-existent realm of senses and thoughts that one's vocabulary would then have to be mapped onto by means of necessarily imprecise verbal 'elucidations', Carnap starts with a purely syntactic specification of the language, which receives meaning through the said process of coordination with our theoretical principles and our observations.[28] It is thus by forging connections between P-rules, the mathematical machinery and our empirical data that logic contributes to endowing the descriptive vocabulary with meaning. As Alan Richardson aptly puts it:

> logic provides the formal conditions for sense-making. Suppose we wish to know the reason the sky is blue. The object for which we want the reason is the sentence 'the sky is blue'; a theoretical reason is then another sentence within the same language from which our target reason logically follows. The very notion of a theoretical reason, therefore, makes sense only internal to a logical framework. Thus there is no realm of theoretical reasons that can be appealed to in advance of the adoption of a logical system. […] The adoption of some logical system is necessary for there to be a notion of evidence or theoretical reason in the first place (Richardson 2007, pp. 300–301).

Footnote 26 contiuned

conception of the normative role of logic, and to demonstrate the significance of the latter for his greater philosophical projects.

[27] I am deliberately skirting a number of intricacies that are inessential to my point here. See Friedman (1999a), Koellner (2013) and Ricketts (2007) for helpful discussions of some of the issues involved.

[28] I am describing Carnap's view during his syntactic period, relying mainly on (Carnap 1936) and (Carnap 1937). After Carnap's shift to semantics it becomes possible to specify the relations between the appropriate syntactic items and their *designata* in the metalanguage explicitly. I take it that the transition to his semantic period does not change anything about the constitutive role of logic in determining meaning. See Carnap (1939).

Thus, a logical framework is necessary for there to be theoretical reasons and hence the possibility of making and evaluating meaningful claims at all. It is in this sense that logic 'provides the formal conditions of sense-making'. It is only once we have specified what follows from what, which statements are logically incompatible with which other ones, and so on, that we determine the truth-conditions and hence the meanings of the sentences in our language.

It should be clear by now that the norms set forth by one's adopted logic (or the L-rules of one's preferred linguistic framework, if you prefer) have a genuinely constitutive function in the relativized sense defined above. They create the very possibility of truth-evaluable and so of cognitive discourse. For only a system of linguistic representation with *some* such logical structure can be said to give rise to meaningful theoretical questions. But this invites the question how much and what kind of logical structure a linguistic framework must have in order for it to be able to play this all-important constitutive role. Given Carnap's firm commitment to tolerance, this necessary requirement cannot be substantive in the sense of providing an identifiable range of logical principles that would constitute a core logic and of which any system of L-rules would then have to be a super-structure. On the other hand, the notion that the logical structure in question would be so minimal that virtually anything—my office chair, say—might be viewed as (the sole) sign-token instantiating a system with the requisite structure is equally implausible. The upshot, it would seem, is that a linguistic framework would have to possess certain minimal structural prerequisites in order for it to qualify as a suitable candidate. The task of identifying these structural prerequisites is a difficult and important one, but it is not one I can undertake within the scope of this paper.

However, even these very general considerations raise a further interesting question: if all systems of linguistic representation apt at fulfilling the said constitutive function must share certain structural features, does this not show that Carnap is committed to a form of absolutism after all? Or at least, does it not show the principle of tolerance to be considerably more tame than we might have believed it to be? And if so, might Carnap's take on logic's normative status not reveal him to be closer to Frege's metaphysical conception of logic—Frege's absolutism—after all? It would then appear that Carnap too is committed to the existence of certain necessary, unrevisable conditions common to all suitable linguistic frameworks.

What is undoubtedly true is that tolerance (and with it our freedom to construct logical systems and to impose the corresponding norms upon ourselves) has its limits. In a sense this should not come as too great a surprise. All the same, our discussion has revealed a convergence in Frege's and Carnap's thinking—their shared commitment to the idea that conceptual activity presupposes the existence of logical structure— which is perhaps unexpected. But it would be wrong, I think, to conclude from this that the opposition between Frege and Carnap is in fact just an opposition between two distinct absolutist positions. The reason this would be a mistake is because it overlooks an important difference between a commitment to the necessity of certain *structural* features on the one hand, and a commitment to a *specific* set of logical principles on the other. The former commitment remains compatible with Carnap's conventionalism, as well as with the relativized version of CT; the latter does not. Frege's commitment is clearly of the latter kind. He claims not only that a system of

logical norms—any system of logical norms—is acceptable so long as it meets certain minimal requirements. Rather we ought to comply with a logical principle like

$$\forall p \forall q(p \rightarrow (q \rightarrow p))$$

because it correctly describes reality. Carnapian tolerance, in contrast, is compatible with systems of logic that countenance the principle in question, as well as with ones—e.g. relevance logics—that do not. Consequently, the fundamental difference between Frege's strict version of the constitutivity thesis whereupon logical normativity remains firmly grounded in its descriptive adequacy on the one hand, and Carnap's relativized version of the constitutivity thesis with its voluntarism about logical norms on the other hand, remains intact. While we cannot choose not to adopt a system of logical norms and still engage in conceptual activity, the particular norms we do adopt still are ones we impose upon ourselves.[29]

Finally, a word on the question of the target activities of logical constitutive norms. As we have noted, the constitutive norms set by logic appear to be directed towards a different activity for Carnap than for Frege. Whilst on Frege's conception the norms induced by logic constrain the conceptual activity of individuals, Carnap is concerned primarily with the constitutive function of logical norms vis-à-vis rigorously defined systems of linguistic representation that codify our scientific activity. As such, they do not straightforwardly apply to any old episode of thinking. Consequently, the reach of logical norms—the individuals and activities that are constrained by these norms—appears to be rather more limited on Carnap's account than it is on Frege's. For Frege, the normative force of logic extends equally to ordinary thinking folk. Research scientists as much as Joe Shmoe must acknowledge norms of logical cogency if they are to count as thinking at all. (Although it matters a great deal more that we have a clear grasp of logical propriety in scientific contexts.)

It is important, however, not to make too much of the question of the normative reach of logic. Frege is no more concerned with the mental processes of individual thinkers than Carnap. He, too, is primarily concerned with applying logic to scientific discourse. It is simply an artifact of Frege's 'natural law'-conception of the normativity of logic that the normative reach of logic extends to Joe Shmoe and scientists alike. On Frege's story, we said, any thinking being is bound by logic, independently of whether he or she has endorsed any system of logic or even has any explicit knowledge of logical principles at all. For the 'legal positivist' Carnap, on the other hand, one is bound by logical laws only in virtue of having adopted them (or, more precisely, the formal logico-linguistic framework that gives rise to them). But clearly, ordinary thinkers have no truck with formal logical systems; nor do they deliberately adopt them. Therein lies the reason why the question of the normativity of logic only arises explicitly in the rarefied sphere of organized scientific research for Carnap.

That being said, Carnap would presumably acknowledge that ordinary thinkers, too, must operate on the basis of certain tacit logico-linguistic principles, even if these principles have never been codified in any exact way. After all, linguistic frameworks are merely formalized rational reconstructions of our ordinary informal logico-linguistic

---

[29] I am grateful to an anonymous referee for helping me clarify my thoughts on this matter.

practices. So, even though formally articulated logical norms are not constitutive for thinking *tout court*, presumably sensitivity to *some* kind of tacitly acknowledged set of broadly logical norms *is* a necessary precondition for the existence of any kind of system of linguistic representation whatsoever. However, Carnap does not, to my knowledge, venture any more detailed claims on the matter. In particular, he says little about the connection between thought and talk. A possible explanation of this may be his repudiation of psychological notions in the context of logic. True to his teacher, Carnap maintained that the introduction of psychological notions of belief and inference is at best spurious, at worst, a source of psychologistic confusions. Nor would Carnap, a staunch naturalist, have been tempted by Frege's normativism about the mental phenomena that make up thinking. Thinking, he claimed, 'belongs to the subject matter of [empirical] psychology but not to that of logic' (Carnap 1962, p. 42).

It is not hard to see, though, why Carnap thought that science would stand to gain much from the rigorous codification of its foundational principles in a formal linguistic framework. The tacit principles regulating our informal practices are not precise enough to determine well-defined shared standards of correctness. But such shared standards are indispensable to serious scientific inquiry and hence to scientific progress. And it is precisely the lack of such shared criteria that Carnap takes to be responsible for the lack of progress in philosophical theorizing.[30] Only in the presence of such standards in the context of a sharply defined linguistic framework is it possible even to formulate well-defined *internal* questions—i.e. questions that we can hope to settle by means of the scientific principles and modes of inference set out by the framework as well as, perhaps, through empirical investigation.[31]

6 Conclusion

Let us summarize our comparison of Frege's and Carnap's versions of CT. We began by noting that strict CT is incompatible with Carnap's principle of tolerance. Instead we identified a relativized version of CT. There is not one logic but a multiplicity of *prima facie* acceptable systems that are disjunctively constitutive: the very possibility of properly truth-evaluable claims presupposes that we should fix on exactly one such system. Second, we found there to be a difference pertaining this time to the norms' targets—that which the norms are norms for: whereas the target of Frege's logical constitutive norms is *thought*, understood as the conceptual activity of individuals,

---

[30] See for instance (Carnap 1963, p. 45).

[31] Ricketts (1994, pp. 182–183) takes a similar line:

Carnap also assigns to logic a fundamental regulative role in enquiry. We observed that Carnap complains of 'disputations in which opponents talk at cross purposes' because there was no basis for 'mutual understanding', no common criterion for deciding the controversy.' Carnap believes that many such wrangles can be avoided, if investigators formulate hypotheses in a syntactically described language. This description fixes a consequence relation for the language; and only in the context of such a relation can one statement be said to support, oppose, or be irrelevant to another. A consequence relation is thus a basic and indispensable part of a common criterion for adjudicating disputes: it grounds agreement on the relevance of further statements to the hypothesis under consideration.

Carnap's relativized constitutive norms set the shared logico-linguistic standards of correctness that make productive scientific theory possible in the first place.[32]

References

Awodey, S., & Carus, A. W. (2007). Carnap's dream: Gödel, Wittgenstein, and Logical syntax. *Synthese*, *159*, 23–45. doi:10.1007/s11229-006-9066-4.

Awodey, S., & Carus, A. W. (2009). From Wittgenstein's prison to the boundless ocean: Carnaps dream of logical syntax. In P. Wagner (Ed.), *Carnap's logical syntax of language* (pp. 79–108). London: Palgrave Macmillan.

Burge, T. (1992). Frege on knowing the third realm. *Mind*, *101*(404), 633–650.

Carnap, R. (1936/1937). Testability and meaning. Philosophy of science, 3/4, 419–471 and 1–40.

Carnap, R. (1937). *The logical syntax of language*. London: Routledge.

Carnap, R. (1939). *Foundations for logic and mathematics*. Chicago: The University of Chicago Press.

Carnap, R. (1962). *Logical foundations of probability*. Chicago: The University of Chicago Press.

Carnap, R. (1963). Carnap's intellectual autobiography. In P. A. Schilpp (Ed.), *The philosophy of Rudolf Carnap* (pp. 3–81). Chicago: Open Court.

Creath, R. (2007). Quine's challenge to Carnap. In M. Friedman & R. Creath (Eds.), *The Cambridge companion to Carnap* (pp. 316–335). Cambridge: Cambridge University Press.

Field, H. (2009). What is the normative role of logic? *Proceedings of the Aristotelian Society*, *83*, 251–268.

Frege, G. (1879). Logic. In H. Hermes, F. Kambartel, & F. Kaulbach (Eds.), *Posthumous writings* (pp. 1–8). Oxford: Basil Blackwell.

Frege, G. (1884/1988). Grundlagen der Arithmetik. Hamburg: Meiner.

Frege, G. (1893/1903/2009). Grundgesetze der Arithmetik. Paderborn: Mentis, Paderborn.

Frege, G. (1897/1979). Logic. In H. Hermes, F. Kambartel, F. Kaulbach (Eds.), Posthumous writings, (pp. 126–152). Oxford: Basil Blackwell.

Frege, G. (1918/1956). The thought. *Mind*, *65*, 289–311.

Frege, G. (1924). Logische Untersuchungen; Dritter Teil: Gedankengefüge" ("Compound Thoughts"). *Beiträge zur Philosophie des deutschen Idealismus*, *3*, 36–51.

---

[32] Readers of Friedman (2001) may have recognized a resemblance between Carnap's relativized CT and Friedman's notion of the 'constitutive a priori'. Constitutive a priori principles have

> the function of making the precise mathematical formulation and empirical application of the theories [formulated on their basis] first possible (idem, p. 40).

and so represent the necessary presuppositions for a certain form of scientific inquiry. That is, constitutive a priori principles play are, as it were, a generalization of synthetic a priori knowledge, the target of Kant's transcendental inquiry, which provides the conditions of the possibility of empirical knowledge, e.g. Euclidian geometry and certain fundamental principles of Newtonian mechanics. However, unlike Kant's constitutive principles, which he took to be set in stone, relativized a priori principles are not immune to revision. Advances in our scientific theories may call for the adoption of novel linguistic frameworks encapsulating novel constitutive principles. (See Friedman (2001) for further discussion and in particular for a defense against Quinian attacks.) I take the notion of relativized CT to be compatible and indeed continuous with Friedman's constitutive a priori principles. What my account adds to Friedman's is the normative dimension. Furthermore, while Friedman considers constitutive principles—logical, mathematical, physical—*en bloc*, my account isolates the constitutive role of logic.

Friedman, F. (1999a). Analytic truth in Carnap's Logical syntax of language. *Reconsidering logical positivism* (pp. 165–176). Cambridge: Cambridge University Press.

Friedman, M. (1999b). Carnap and Wittgenstein's Tractatus. *Reconsidering logical positivism* (pp. 177–197). Cambridge: Cambridge University Press.

Friedman, M. (1999c). Tolerance and analyticity in Carnap's philosophy of mathematics. *Reconsidering logical positivism* (pp. 198–233). Cambridge: Cambridge University Press.

Friedman, M. (2001). The dynamics of reason. Palo Alto, CA: CSLIPublications, 2001.

Goldfarb, W. (2010). Frege's conception of logic. In M. Potter & T. Ricketts (Eds.), *The Cambridge companion to Frege* (pp. 63–85). Cambridge: Cambridge University Press.

Harman, G. (1986). *Change in view: Principles of reasoning*. Cambridge: M.I.T. Press.

Kant, I. (1787/1998). Kritik der reinen Vernunft. Hamburg: Meiner.

Koellner, P. (2013) Carnap on the foundations of mathematics.

MacFarlane, J. (2000). What does it mean to say that logic is formal? PhD thesis, University of Pittsburgh, Pittsburgh.

MacFarlane, J. (2002). Frege, Kant, and the logic in logicism. *The philosophical review*, *111*, 25–65.

MacFarlane, J. (2004). In what sense (if any) is logic normative for thought? Unpublished.

Richardson, A. (2007). Carnapian pragmatism. In M. Friedman & R. Creath (Eds.), *The Cambridge companion to Carnap* (pp. 295–315). Cambridge: Cambridge University Press.

Ricketts, T. (1994). Carnap's principle of tolerance, empiricism, and conventionalism. In P. Clark & B. Hale (Eds.), *Reading Putnam* (pp. 176–200). Oxford: Blackwell.

Ricketts, T. (1996). Logic and truth in Frege. *Proceedings of the Aristotelian Society*, *70*, 121–175.

Ricketts, T. (2007). Tolerance and logicism: Logical syntax and the philosophy of mathematics. In M. Friedman & R. Creath (Eds.), *The Cambridge companion to Carnap* (pp. 200–225). Cambridge: Cambridge University Press.

Searle, J. (1969). *Speech acts*. Cambridge: Cambridge University Press.

Searle, J. (2010). *Making the social world*. Oxford: Oxford University Press.

Sullivan, P. (2004) Frege's logic. In D. M. Gabbay and J. Woods (Eds.), Handbook of the history and philosophy of logic, volume 3, (pp. 671–762). Amsterdam: North-Holland.

Taschek, W. (2008). Truth, assertion, and the horizontal: Frege on 'the essence of logic'. *Mind*, *117*, 375–401.

Tolley, C. (2006). Kant on the nature of logical laws. *Philosophical topics*, *34*, 371–407.

Tolley, C. (2008). Kant and the normativity of logic. In V. Rohden, R. Terra, G. de Almeida, & M. Ruffing (Eds.), *Recht und Frieden in der Philosophie Kants: Akten des X. Internationalen Kant-Kongresses* (Vol. 5, pp. 215–227). Berlin: De Gruyter.

Wedgwood, R. (2006). The normativity of the intentional. In B. McLaughlin & A. Beck- ermann (Eds.), *The Oxford handbook of the philosophy of mind*. Oxford: Clarendon Press.

Weiner, J. (1995). Realism bei Frege: Reply to Burge. *Synthese*, *102*(3), 363–382.

Williams, B. (1976). Deciding to believe. *Problems of the self* (pp. 136–151). Cambridge: Cambridge University Press.

Williamson, T. (1996). Knowing and asserting. *Philosophical review*, *102*, 489–523.

Zangwill, N. (2005). The normativity of the mental. *Philosophical explorations*, *8*, 1–19.