Carsten Breul

epistemological point of view.

References


Ducasse, C. J. (1951), Nature, Mind, and Death. La Salle (IL): Open Court.


Otávio Bueno

PRAGMATICS, PRAGMATIC TRUTH AND POSSIBLE WORLDS

1. Introduction

The use of possible worlds in formal semantics and in systematic philosophy has been explored in detail in the last few decades. Kripke and Lewis, just to mention two examples, have discussed the ways in which this talk can be useful for obtaining metalogical results in modal logic and for devising an analysis of modal discourse respectively. However, according to Lewis, as far as metalogical results are concerned, there is no real need for possible worlds. After all, the only thing which is required is a set of objects, which can even be thought of as a possible world, but which can actually be anything one pleases (Lewis 1986, 17). Where possible worlds are in fact needed, Lewis stresses, is in the application of such results — at a philosophical level, not at a mathematical one.

The problem, at least for some people, is that the talk of possible worlds, from Lewis’s perspective, involves a commitment to modal realism; that is, the claim that there are non-actual worlds. And this is crucial for Lewis’s purposes. Otherwise, most of his claims for the fruitfulness of possible worlds talk — in the analysis, for instance, of modality, counterfactuals and properties (Lewis 1986, 3-69) — and against ersatz modal realism1 does not follow.

For many writers, especially empiricists and fictionalists of various sorts (see, for example, van Fraassen 1989, and Rosen 1990), the belief in the existence of possible, but non-actual, worlds is something unacceptable. On the other hand, the benefits gained by the introduction of such worlds are remarkable. However, in contrast to Lewis (1986, 3-5), these writers will not claim that the fact that the hypothesis of the plurality of worlds is serviceable is a reason to consider it to be true. On the contrary, the very notion of truth is to receive considerable restrictions, especially in van Fraassen’s view. In both cases, we have proposals to the effect that a fictionalist account of modality could be presented (in the sense that a commitment to possible worlds is not needed in the understanding of modality). Nonetheless, in neither case has a proper theory of modality actually been constructed.

The aim of the present paper is bridge this gap, roughly sketching such a theory. Part of the explanation of why this theory has not already been formulated comes

---

* Many thanks to Steven French, Newton da Costa and especially to John Divers for illuminating and helpful discussions on the issues addressed here.

1 According to ersatz modal realism, there is only one world and innumerable abstract entities which represent ways that this world could have been (Lewis 1986, 136-191).
from the lack of an appropriate framework in which it can be stated. In my view, such a framework can be found in da Costa’s and French’s partial structures approach, which involves both a notion of partial structure and of pragmatic truth (see da Costa and French 1989 and 1990; this framework was first formulated in Mikenberg, da Costa and Chaququi 1986). In order to do so, I shall first present, in section 2, da Costa’s and French’s account, stressing the role of partial structures and pragmatic truth in this context. In section 3, in terms of this setting, I will advance my alternative, putting forward a notion of modality from a pragmatic perspective. Finally, in section 4, I will spell out the role that pragmatics plays in this proposal, arguing that it is largely responsible for the virtues found in the latter.

2. Partial structures and pragmatic truth

The investigation of a certain domain \( \Delta \) of knowledge involves the study of the relations among its objects. Nonetheless, the information about such objects is frequently ‘incomplete’, since one does not know whether certain relations concerned hold for all the objects of the relevant domain (or for all the \( n \)-tuples thereof). In order to accommodate this situation, da Costa and French advanced the concept of a *partial relation*; that is, a relation which is not defined for every object, or \( n \)-tuple of objects, of its domain. More formally, we can characterise an \( n \)-place partial relation \( R \) over \( D \) as a triple \((R^1, R^2, R^3)\), where \( R^1 \), \( R^2 \) and \( R^3 \) are mutually disjoint sets, with \( R^1 \cup R^2 \cup R^3 = D \), and such that \( R^1 \) is the set of \( n \)-tuples that belong to \( R \); \( R^2 \) of those \( n \)-tuples that do not belong to \( R \); and \( R^3 \) those \( n \)-tuples for which it is not defined whether they belong or not to \( R \). (Notice that if \( R^3 \) is empty, \( R \) is a standard \( n \)-place relation which can be identified with \( R^1 \); see da Costa and French 1990, p. 255, note 2.)

However, in order to accommodate our patterns of modelling information, something more than partial relations is required: an appropriate notion of *structure* should also be presented. This notion is similarly thought of as incorporating the ‘openness’ typical of our epistemic situation, where we usually face ‘incomplete’ information. Based on a partial relation, da Costa and French formulate the concept of a *partial (or pragmatic) structure*. It is a set-theoretical structure of the form \((D, R_\alpha, P)_{\alpha \in \Delta}\), where \( D \) is a non-empty set (representing the objects used in the systematisation of the relevant domain of knowledge \( \Delta \), whose study we are concerned with), \((R_\alpha)_{\alpha \in \Delta}\) is a family of partial relations defined over \( D \), and \( P \) is a set of sentences (representing what is known, or taken to be known, about \( D \), including laws and observable statements).

In terms of partial structures, we can formulate a particular notion of truth, which extends Tarski’s account, and leads to the characterisation of the concept of pragmatic truth.\(^2\) Since the Tarskian semantics was constructed only for total structures, in order to use it, it is necessary that a total structure be obtained from a partial one, ‘extending’ its partial relations. Such ‘extended’ structures are called *normal structures*. More formally, given a partial structure \( A = (D, R_\alpha, P)_{\alpha \in \Delta} \) we say that the structure \( B = (D', R'_\alpha, P')_{\alpha \in \Delta} \) is an A-normal structure if: (1) \( D = D' \); (2) every constant of the language in question is interpreted by the same object both in \( A \) and in \( B \); (3) \( R'_\alpha \) extends the corresponding relation \( R_\alpha \) (in the sense that, as opposed to the latter, the former is defined for every \( n \)-tuples of objects of its domain); and (4) if \( \alpha \in P' \), then \( \alpha \) is true in \( B \) (in the Tarskian sense).

It should be noticed that, given a partial structure, it is not always the case that it is possible to extend it into a normal one. Necessary and sufficient conditions for this result are as follows (see Mikenberg, da Costa and Chaququi 1986). Given a partial structure \( A = (D, R_\alpha, P)_{\alpha \in \Delta} \) for each partial relation \( R_\alpha \) we construct a set \( M_\alpha \) of atomic sentences and negations of atomic sentences such that the former corresponds to the \( n \)-tuples that satisfy \( R_\alpha \) and the latter to those \( n \)-tuples that do not satisfy \( R_\alpha \). Let \( M \) be \( \bigcup_{\alpha \in \Delta} M_\alpha \). Therefore, a pragmatic structure \( A \) admits an A-normal structure if, and only if, the set \( M \cup P \) is consistent. In other words, the extension of a pragmatic structure \( A \) to a total A-normal structure \( B \) is possible whenever the extension of the partial relations is made in such a way that the consistency between the new extended relations and the accepted basic propositions \( P \) is guaranteed.

Normal structures are introduced in order to present an interpretation of the language in question. This strategy was also employed by Tarski in his characterisation of the concept of truth: the latter was defined in a *structure*. And the same feature is employed in the formulation of the concept of pragmatic truth. We say that a sentence \( \alpha \) is *pragmatically true* in a partial structure \( A = (D, R_\alpha, P)_{\alpha \in \Delta} \) according to an A-normal structure \( B = (D', R'_\alpha, P')_{\alpha \in \Delta} \) if \( \alpha \) is true in \( B \) (in the Tarskian sense). If \( \alpha \) is not pragmatically true in \( S \) according to \( B \), we say that \( \alpha \) is pragmatically false (in \( S \) according to \( B \)).

Notice that the concept of pragmatic truth is an *as if* concept: if a sentence \( \alpha \) is pragmatically true, it describes the domain in question *as if* its description were true. Being consistent with the basic knowledge (represented by the set of accepted sentences \( P \)) of this domain, \( \alpha \) grasps some of the main bits of information about it, without committing us to the acceptance of the further bits (formulated by the extended A-normal structure) as true.

\(^2\) Pragmatic truth receives this name because (i) it incorporates mathematically certain constraints found in the pragmatic conception of truth (see da Costa and French 1997, Chapter 1), and (ii) it formulation was heuristically inspired by the writings of pragmatist philosophers, such as Peirce and James (see Mikenberg, da Costa and Chaququi 1986).
3. Modalities from a pragmatic perspective

The project to be presented here – an analysis of modality in terms of partial structures and pragmatic truth – has, as its main philosophical motivations, (i) the idea that modalities can be understood from an empiricist perspective (actually, a constructive empiricist one; see van Fraassen 1989), and that, in order to do so, (ii) no particular commitment to the existence of possible worlds is required. In this sense, as Divers has noticed (in a personal communication), this is a deflationary project, as far as possible worlds are concerned.

The main strategy for articulating such a project consists in devising an analysis according to which modal claims have truth-value – something which is sensible enough to suppose –, although the aim of modal discourse is not to establish the truth. Instead of requiring it to be true simpliciter, such a discourse is evaluated and actually expected to be only pragmatically true; that is, true with respect to certain structures (pragmatic ones) in a particular domain. We can thus assume all the richness of Lewis’s possible worlds, exploring the expressive power they offer, without needing to be committed to them – as long as all we demand for the talk of possible worlds is that it is pragmatically true.

And this is so for at least two reasons. First, as will be clear in a moment, there is no quantification over possible worlds; they are actually reinterpreted in terms of A-normal structures. The main idea is that the process of extending a partial structure A to an A-normal, total structure B has to be conducted in such a way that B is associated with a maximally consistent set of sentences – atomic sentences and negation of atomic sentences of the language under consideration (see section 2) –, and in this regard B can be viewed as a possible world. However, and this is the second reason, possible worlds are taken only as convenient fictions for the understanding of modal discourse; no claim is made to the effect that the use of such fictions reflects something about reality. Modal discourse, understood in terms of possible worlds, does not need to be true to be good, it suffices if it is pragmatically true.

These two considerations thus offer a motivation for the introduction of the following truth-conditions for modal sentences:

Necessarily \( P \) (\( \Box P \)) is pragmatically true (in a partial structure \( A \)) iff for all A-normal structures, \( P \) is pragmatically true.

Possibly \( \neg P \) is pragmatically true (in a partial structure \( A \)) iff there is some A-normal structure in which \( P \) is pragmatically true.

It should be pointed out that (i) although the fact that a sentence \( P \) is pragmatically true does not imply that it is true (after all, there might be a distinct A-normal structure in which it is not true), if \( P \) is pragmatically true in all A-normal structures, then it is true. Thus, in the analysis just formulated, if \( \Box P \) is pragmatically true, then \( P \) is pragmatically true (in fact, in that case, \( P \) is true). Thus, just as in the classical case, we have that \( \Box P \rightarrow P \). Moreover, (ii) from the fact that \( \Box P \) is pragmatically true, although we can actually conclude that \( P \) is pragmatically true, because pragmatic truth does not imply truth, we cannot conclude that \( P \) is true. So, we are not led to the modal fallacy of inferring \( P \) from \( \Box P \).

With regard to the ‘ontological adequacy’ of the present account, it is worth noticing that throughout the analysis no quantification was made over possible worlds. Modalities were understood as properties of our structures. In this sense, a truly fictionalist account of modalities has been suggested. Just as the notion of pragmatic truth represents the idea that it is just as if a sentence were true (such a sentence is considered in a certain domain, represented by a partial structure), the analysis of modalities just introduced is meant to represent the idea that our modal claims are nothing but an exploration of our models and structures, and no reification of, nor even reference to, possible worlds is required to accommodate this talk (in conformity to the constructive empiricist view; see van Fraassen 1989).

This point can be spelled out by taking the \( R_3 \)-component of a partial relation (over a certain domain \( D \)) as referring to what might have been the case in \( D \); in other words, to the possibilia. (This may be called the ‘modal interpretation of a partial structure.) When one wonders about what might have happened to the development of philosophy in the twentieth century had Wittgenstein decided to become a engineer, one is exploring precisely the sort of ‘openness’ found at the modal level, an ‘openness’ that, of course, can be nicely accommodated in the partial structures framework. Each particular way of extending a partial relation to a total one supplies a different way the world (represented by the domain under consideration) might have been.

Alternatively, one can also consider an epistemic interpretation of a partial structure. In this context, the partial relations model the ‘incompleteness’ of our knowledge about \( D \). Of course, our modal knowledge faces such an ‘incompleteness’, just as various other kinds of knowledge do. And although this ‘incompleteness’ may decrease with the increase of information about the relevant domain, it will never be completely removed. In a sense, this is one of the aspects of modality: the rich exploration of possibilities.

Finally, as for the ‘definitional’ status of the present account, the proposal sketched here is not meant to supply a reductive (eliminative) analysis of modality, since it explicitly relies on a modal notion: consistency. As was seen in section 2, this notion lies at the heart of the existence of A-normal structures, in terms of which pragmatic truth was defined. This ‘non-reductiveness’, however, is taken as a virtue, rather than a vice of the present proposal, since in my view any purely extensional analysis of modality should have got something wrong. After all, modalities, if taken seriously enough, are intensional things.

---

\(^3\) In what follows, I have been greatly helped by John Divers.
4. A plea for pragmatic modalities

Pragmatic considerations enter in two stages in the account just presented. First, the claim that an A-normal structure can be viewed as a possible world, being something beyond a purely structural claim, is pragmatical; it is concerned with us, with our own way of understanding such structures and relating them, for heuristic considerations, to other structures (possible worlds). Second, the way of interpreting a partial structure, either in a 'modal' or in an epistemic way, similarly brings again a pragmatic point. We consider such structures 'from outside', and claim that they are concerned with representing ways the world might have been (or our knowledge of it might have evolved). As a result, modal claims can be understood without the postulation of possible worlds, which are only useful fictions. In using such worlds, all we strive for is pragmatic truth. And this is enough.

References


---

Tom Burke

MINIMAL REQUIREMENTS FOR formalizing Dewey's Theory of Inquiry

Contemporary deductive logic is a study of recursively defined grammars and various kinds of deductive inference sanctioned by such grammars, while contemporary inductive logic is a study of an assortment of probabilistic inference techniques. In contrast, John Dewey's 1938 Logic: The Theory of Inquiry, while philosophically sophisticated and no less abstract, is devoid of the kinds of mathematical formalism typical of contemporary logic. Dewey views logic as a study of generic features of inquiry. Contemporary mathematical logic, as a body of formal techniques and principles, could be incorporated into this view if we could (1) place these technical concerns within a broader theory of inquiry, and (2) link them to the operational foundations of that broader theory.

Dewey (1938) defines inquiry as a controlled transformation of an indeterminate situation into one which is sufficiently determinate to become a unified whole. This pattern of inquiry is reflected in Kuhn's 1970 account of scientific revolution and subsequent stabilization of "normal" scientific activities. This may be viewed as a movement not towards an end of science but towards a flourishing of science where, ideally, instrumentalational, experimental, and conceptual machineries should work effectively together to facilitate warranted progress toward a coherent mastery of a given subject matter. Such a state of warranted flourishing is what Dewey means by "knowing". And such successes are generally fallible, given that the existing status quo tends to be undermined if and when inconsistencies arise or as progress otherwise begins to bog down, at which point scientific activities inevitably take off in new directions. As a movement from destabilizing disturbances to stabilized research activities, such episodes of scientific normalization exhibit the general pattern of inquiry in Dewey's sense of the term.

For Dewey, understanding this pattern of inquiry is the aim of logic. As taught in mathematics and philosophy departments today, logic is focused on systems of inference as they would function in stable cases of normal science. In contrast, Dewey would place all phases of inquiry within the scope of logic. Can this broader conception of logic be cast in contemporary formalistic terms?

Formal Models of Inquiry: The formal apparatus outlined below should be viewed as a body of tools, principles, methods for modeling inquiries. This formal apparatus by itself is not a theory of inquiry, but is intended to underwrite a method of modeling which, say, a political theorist, medical ethicist, military strategist, or any other problem solver might use to represent and control the transformation of given problem domains. Logic as such should provide a range of representational tools and principles applicable and testable in concrete inquiries.