true, which we may represent by 0. (There may be more ways of not being true; however, this will not matter for present purposes.) How is *validity* to be understood? In the jargon of many-valued logic, validity is to be understood in terms of *designated values*, these being the different ways of being true, as it were. Specifically, an argument is valid iff (necessarily) if all the premises are designated, then the conclusion is designated. Equivalently, an argument is valid iff there is no case in which all premises are either 1 or ½ but the conclusion is 0.[4]

The pluralist's reply, then, is straightforward. Pluralists are committed to there being two different ways of being true. This, however, does not conflict with the usual semantic account of validity. Validity is still necessary truth-preservation; however, 'truth-preservation' must be understood pluralistically – as the preservation of any way of being true. Specifically, pluralists may agree with Tappolet that the (wet cat) argument from (1) and (2) to (3) is valid provided that there is no case in which (1) and (2) are designated but (3) fails to be designated.

One might ask about which of the numerous many-valued logics pluralists should endorse. For now, however, this question may be left aside. The only point of this paper is that Wright's proposed pluralistic approach need not founder on mixed inferences; Tappolet seems to have posed a false dilemma. By following the framework of many-valued logics, pluralists can have their mixed inferences and their pluralism too. Given that pluralists are so-called because they recognize different truth predicates, the lead of many-valued logic is a natural one for them to follow.[5]

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[4] I assume familiarity with many-valued logic, but for detailed discussion see N. Rescher, *Many-valued Logic* (New York: McGraw-Hill, 1969); for a brief discussion see J. Beall and G. Restall, 'Logical Consequence', in E. Zalta (ed.), *Stanford Encyclopedia of Philosophy* (CSLI, Stanford Univ., forthcoming).

[5] I am grateful to Mark Colyvan, Bas van Fraassen, Jay Garfield and Ed Gettier, each of whom has contributed to this paper in various ways.

TRUTH PLURALISM AND MANY-VALUED LOGICS: A REPLY TO BEALL

By Christine Tappolet

I. THE TRILEMMA

Truth pluralism, as defended by Crispin Wright, is the view that there are different truth predicates corresponding to different sorts of sentences. Briefly, whereas descriptive sentences are claimed to be assessable in terms of 'heavyweight' truth,

which involves realism about the corresponding entities, allegedly non-descriptive sentences, such as sentences about the moral or the comical, are supposed only to be assessable in terms of 'lightweight' truth, a kind of truth that does not involve realism.[1]

I have argued that what I call 'mixed inferences', that is, inferences which involve both descriptive sentences and alleged non-descriptive sentences, are a problem for pluralism about truth predicates.[2] Mixed inferences apparently make for a trilemma. The truth pluralist has to choose between one of the following options: (a) denying that such inferences can be valid; (b) claiming that, in addition to the different truth predicates, there is a unique predicate characterizing the premises and the conclusion; or (c) denying the classical account of validity, according to which an argument is valid on condition that the truth of the premises necessitates the truth of the conclusion.

None of these options is palatable. As should be clear from my paper 'Mixed Inferences', examples of obviously valid mixed inferences are easily found. In case anyone thinks that the problem could be dealt with by the claim that so-called heavyweight truths can entail lightweight truths, here is another example:

1. Cruel cats are hungry
2. This cat is cruel
3. Therefore this cat is hungry.

One might well doubt the soundness of this argument, but it is clearly valid. The second horn leaves one wondering why the truth predicate that is preserved by the inference is not the only one that is needed. Unless the pluralist gives us a good reason to postulate further truth predicates, Ockham's razor has to be applied. As to the third horn, it is clearly an option one should choose only as a last resort. On the whole, it seems a much better idea to stick to a monistic conception of truth.

II. BEALL'S REPLY

In a neat attempt to save truth pluralism, JC Beall argues that truth pluralism is in fact compatible with the classical account of validity.[3] His suggestion is that pluralists can help themselves to the account of validity used in many-valued logics. More precisely (p. 382):

> validity is to be understood in terms of *designated values*, these being the different ways of being true, as it were. Specifically, an argument is valid iff (necessarily) if all the premises are designated, then the conclusion is designated.

[1] C.J.G. Wright, 'Realism, Anti-realism, Irrealism, *Quasi*-realism', in P. French *et al.* (eds), *Midwest Studies in Philosophy*, Vol. XII (Univ. of Chicago Press, 1988), pp. 25–49, and *Truth and Objectivity* (Harvard UP, 1992).

[2] See my 'Mixed Inferences: a Problem for Pluralism about Truth Predicates', *Analysis*, 57 (1997), pp. 209–10.

[3] Beall, 'On Mixed Inferences and Pluralism about Truth Predicates', *The Philosophical Quarterly*, 50 (2000), pp. 380–2 above.

Thus if T_1 is the truth predicate that corresponds to descriptive sentences, while T_2 is the one corresponding to moral or comical sentences, an argument is valid if and only if the conclusion cannot be false if the premises are either T_1 or T_2; the conclusion has to be either T_1 or T_2. So far, so good. Even though this surely amounts to a revision of our ordinary validity concept, it is possible to define validity in this way.

The important question, however, is whether this account is congenial to truth pluralism. The problem is that it appears to presuppose a truth predicate that can be applied to sentences of all sorts. Of course, Beall would like us to believe that T_1 and T_2 are the only truth predicates. More precisely, he has to deny that there is a more general truth predicate – there is, of course, no limit to the number of truth predicates a pluralist can postulate at the lower level of generality.

For it to be obvious how difficult it is to be convinced by this, it suffices to think about the expression 'ways of being true' which Beall uses to elucidate the concept of designated values. The term 'true' in 'ways of being true' surely consists of a generic truth predicate, so that if a sentence is T_1 or T_2, it will also fall under this generic truth concept. An analogy might help. Blue and green are different ways of being coloured. But if 'blue' and 'green' are colour predicates, so is 'coloured'; 'coloured' is simply the most generic colour predicate.

Now Beall might reply that this is not how the expression 'ways of being true' is to be understood. However, it remains true that sentences which are T_1 and sentences which are T_2 share a common feature – they are designated. And it is difficult to believe that this is not a kind of truth. After all, one important truism usually thought to characterize truth applies to it: it is what is preserved by inferences.

Given this, the same question arises: why should we need the many truth predicates instead of the one that does the inferential job, i.e., what I called the generic truth predicate? Beall's suggestion does not allow for an escape from the trilemma; it amounts to the claim that, in addition to the different truth predicates corresponding to different types of sentences, there is a unique truth predicate that does the inferential job.

III. MIXED CONJUNCTIONS: A FURTHER PROBLEM

There is a further problem for the claim that there is a plurality of truth predicates, thrown up by mixed sentences and, more particularly, mixed conjunctions. The sentence 'This cat is wet and it is funny' can obviously be true. But what sort of truth predicates would apply to it? This is a tough question for truth pluralism. On this view, the first conjunct is supposed to be T_1, if true at all, and the second T_2, if true at all. Given this, it would be extremely odd to say that the conjunction itself is assessable in terms of either T_1 or T_2. Suppose that T_1 is a matter of correspondence to natural facts, whereas T_2 is the result of a social agreement. The problem is that conjunctions involving the two kinds of truth predicates will be neither a matter of correspondence to natural facts nor a result of social agreement.

Mixed conjunctions need to be true in a further way. Maybe a truly minimal truth predicate will do the job. But then each conjunct has to be true in the same way. This is what follows from the truism that a conjunction is true if and only if its conjuncts are true. Hence the question arises again why this further way of being true is not the only one we need. The pluralist owes us a reason for thinking that, in addition to the kind of truth that satisfies the conjunction truism, there are some truth predicates which need not satisfy it.

Interestingly, advocates of many-valued logics will find it more difficult to deal with this problem than with the mixed inference problem. The reason is that they will have to give an account of the *truth* of the conjunction. We can expect them to say that the conjunction is designated if and only if the conjuncts are. But as soon as one realizes that the designated value of the conjunction is a kind of truth, this move will become suspect. The kind of truth the conjunction admits, whatever that is, will become the best candidate for the unique truth-value that is needed.

IV. AN INFERENTIALLY IRRELEVANT DISTINCTION

I shall close with a deeper worry. The distinction between heavyweight and lightweight truth does not appear to allow for any difference in the inferential role of propositions. So there would be no formal difference between the two kinds of truth.

The kind of truth involved in the disjunction introduction rule, for instance, supposing that there are lightweight and heavyweight truths, does not make for a difference in its application. You can have both of the following:

This cat is hungry; therefore this cat is hungry or this cat is cruel
This cat is cruel; therefore this cat is cruel or this cat is hungry.

As far as I can see, the same consideration applies to all the rules of natural deduction. The introduction and elimination rules do not appear to be sensitive to putative differences between lightweight or heavyweight truth, supposing there are such things. Possibly the appearances are not to be trusted here. But clearly the onus of proof lies with the truth pluralist.

Now if the distinction between the two sorts of truth postulated by the pluralist is inferentially irrelevant, truth pluralism has a serious problem. Of course, it could be claimed that though there is no formal difference, there is a substantial difference between the two kinds of truths. But it is difficult to believe that we need predicates corresponding to lightweight and heavyweight truth in addition to the unique inferentially relevant truth predicate we need and are lucky enough to have.

This is bad news for truth pluralism. I take it to be good news for cognitivists, maybe even for realists about the moral and the comical, but this is controversial.[4]

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[4] I am grateful to Jérome Dokic, Jean-Pierre Marquis, Fabienne Pironet and especially François Lepage for helpful discussions.