

## II—PETER MILNE

### WHAT IS THE NORMATIVE ROLE OF LOGIC?

In making assertions one takes on commitments to the consistency of what one asserts and to the logical consequences of what one asserts. Although there is no quick link between belief and assertion, the dialectical requirements on assertion feed back into normative constraints on those beliefs that constitute one's evidence. But if we are not certain of many of our beliefs and that uncertainty is modelled in terms of probabilities, then there is at least *prima facie* incoherence between the normative constraints on belief and the probability-like structure of degrees of belief. I suggest that the norm-governed practice relating to degrees of belief is the evaluation of betting odds.

#### I

My starting point is a little different from Professor Field's. I'm going to begin with an area in which the normative force of logic is quite clearly discerned, at least by some authorities, and then work back from there to belief. The starting point I have in mind is assertion.

The making of assertions is a rule- or convention- governed practice. Amongst the conventions governing assertion one stands out dramatically for present purposes: that one stands by the logical consequences of what one asserts. This is a commonplace of rational discourse. Assertion itself conventionally indicates some form of commitment to what one asserts, and this commitment carries over to the logical consequences of what one asserts. Vic Dudman has this to say:

I deprecate the idea of explaining discourse in terms of belief, preferring C. L. Hamblin's notion of individual speakers' *commitments*. To these belief is strictly irrelevant: 'We do not believe everything we say; but our saying it commits us whether we believe it or not' (*Fallacies* (London, 1970): 264). When a speaker affirms a proposition, for example, I construe that as her incurring public commitments to its truth, not as her confiding private belief in its truth. Commitment has

desirable properties denied to belief, e.g., it is sheer romancing to suppose that a speaker's current beliefs might be consistent and closed under deduction, but it is a fundamental dialectical requirement that each speaker keep her cumulative *commitments* consistent, and treat entailments of commitments as commitments. (Dudman 1991, p. 228, n. 14)

One might think the divorce of belief and assertion here a little overplayed, but that there is some such divorce is pointed to by an observation of G. E. Moore's:

If by a slip you say 'Broad' when you mean 'Moore' you can be said to have asserted that Broad lectured for 4 years at Columbia, when all you intended to assert was that Moore did; & you *can* be said to have *told* people that Broad did. (Moore 1962, pp. 303–4, cited Wolgast 1977, p. 93)

Thus the commitments one takes on in assertion need not reflect belief at all. Through inadvertence one may incur commitments to the truth of propositions one is perhaps even unaware that one has voiced (as, say, when one makes a mistake in a foreign language) and to their logical consequences.

Michael Dummett has emphasized this point that assertion should not be taken as the expression of belief (or any other propositional attitude).

We have a natural tendency to think of these various linguistic acts—making an assertion, expressing a thought—as the external expression of an interior act of adopting a particular mental attitude. This tendency is of course reinforced by the fact that to some of them interior acts or events do correspond—an act of judgment, or a thought's suddenly occurring to one, though not as true or false; though indeed asking oneself a question is somewhat unlike asking someone else a question, and giving oneself a command very unlike giving someone else a command. The analysis of these interior acts and events is a matter of epistemology, not of logic; but the *linguistic* acts should be classified as conventional actions, not as the external expression of interior states. Assertion, for example, is to be explained in terms of the conventions governing the use of those sentences which are understood as having assertoric force, not as the utterance of a sentence with the intention of expressing one's interior act of judgment (or interior state of belief) that it is true. (Dummett 1981, p. 311)

What we see from Dudman, Moore, and Dummett—unlikely bed-

fellows perhaps—is that assertion is, first and foremost, a convention-governed practice, it is not primarily the expression of a propositional attitude. Of course, as Dummett says, mental states or events may correspond to the making of assertions, but we should read this as *may* correspond; there is, as Moore's observation indicates, no necessity.

What is the nature of the commitments to an asserted proposition and to the logical consequences of the propositions one has asserted? Or, to ask if not the same question then a closely related one, how does one discharge the commitments taken on? To discharge the commitment to a proposition, be it asserted or a logical consequence of asserted propositions, one either withdraws an assertion on which the proposition depends or defends the proposition—provides evidence, reasons, a justification—when challenged to do so. We shall return to the form such challenges normally take. Withdrawal may occur without challenge, for example it may occur upon the speaker's recognition that what she said was not anything she intended to say, as might happen with Moore's slip. And providing evidence, finding reasons, a justification for the consequences of assertions does not require a challenge. One may do it 'idly' or in an attempt at systematic elaboration of claims one has made. For now, we note that what is *expected* of a participant in the public practice of assertion is that she stands by the consequences of her unwithdrawn assertions. And it is in the nature of such a public, convention-governed practice that this expectation may, on occasion, fail to be met.

As in any public practice we must allow a competence–performance distinction: people make mistakes. Breaches of the conventions must, however, be relatively infrequent. As Peter Geach observed,

Most chess moves are valid, most intentions are carried out, most statements are veracious; none of these statements is just a rough generalization, for if we tried to describe how it would be for most chess moves to be invalid, most intentions not to be carried out, most statements to be lies, we should soon find ourselves talking nonsense. (Geach 1956, p. 39)

Geach's point is that this is no mere empirical fact. The practices of playing chess, forming intentions, making statements, would simply collapse (or never get off the ground in the first place) were it to be that much of the time the 'rules' were not complied with.

Why is it that, under the norms governing assertion, we are to

treat entailments of commitments as commitments? The obvious answer stems from the platitude that assertion aims at truth, a platitude implicit in Geach's 'most statements are veracious'. As Dummett puts it, 'Assertions take place against the background of a custom of uttering them with the intention of saying something true' (Dummett 1981, p. 302). (That assertion aims at truth does not, of course, count against occasional subversion, both deliberate and unwitting, of that aim: this is what we take from Geach.) The logical consequences of truths are truths and so the consequences of what a participant asserts are true if she succeeds in complying with the aim of assertion. This does not at all mean that she must be aware of those consequences: as said already, the commitment undertaken is discharged either in withdrawing an assertion upon which a consequence depends logically or on standing by the consequence *when the consequence comes to her attention*. But since the consequences of truths are truths, a challenge to a consequence is a challenge to the participant's assertions: she is challenged on the grounds of not having, or at least not obviously having, conformed to the norm of truth governing assertion. Since assertion aims at truth, assertion is governed by the norm *assert only what is true*.

Assertion being a public practice, it operates under the sanction of the community of participants in that practice. Thus while the norm speaks of commitment to logical consequences, in practice the community determines what count as consequences. In line with Hilary Putnam's division of linguistic labour in the case of the reference of natural kind terms, the ultimate communal determination as to what count as logical consequences may owe some to the theoretical activity of philosophers and logicians: those who theorize logical consequence. Now, as Alan Millar points out, rule- or convention-governed practices may survive not just accidental contravention of the rules but even the deliberate and systematic flouting of some of the conventions by some of the participants; it is, he observes, quite possible for individuals to participate in practices with the aim of effecting change in the rules/conventions:

Practices are modifiable and can be modified with good reason. One can envisage circumstances in which players have good reason to flout an unpopular rule with a view to having it abandoned or modified. Similar considerations apply to practices associated with institutional offices. (Millar 2004, p. 86)

In line with this observation on the modifiability of practices, there can be, or at least seems to be, room for rational change of logic. Which logic, which reckoning of logical consequence, assertion should answer to can, it seems, be a matter of rational debate. Whether there is a fact of the matter regarding ‘the correct logic’ has some bearing here. Should there be a correct logic, given any leanings to fallibilism over its identity, it would be harsh to call members of the losing side in any debate over logical consequence *irrational* unless there are conclusive grounds for attributing error. Even then it may be that if there is a good explanation for their error one may hesitate to call them irrational. Was Frege irrational to adopt his Basic Law V?<sup>1</sup> If there is no fact of the matter as to the correct account of consequence, there is, in the same sense, no fact of the matter regarding the commitments taken on in assertion (cf. Millar 2004, p. 73, n.46). This is not to say that disputes cannot be settled on grounds other than correctness—for example, achieving reflective equilibrium between intuitions concerning what follows from what and demands of systematization.

In the twentieth century almost nothing in logic went uncontested. Even the rule of ‘and’-elimination (conjunctive simplification)—from  $A \wedge B$  infer  $A$ , from  $A \wedge B$  infer  $B$ —has been contested (see, for example, Gahringer 1970; Thompson 1991). That said, we should take seriously the thought that a grasp of some elementary inferences may be constitutive of understanding. We find Hare in *The Language of Morals* saying, over half a century ago,

Thus, if someone professed to admit that all men were mortal and that Socrates was a man but refused to admit that Socrates was mortal, the correct thing to do would be not, as has sometimes been suggested, to accuse him of some kind of logical purblindness, but to say, ‘You evidently don’t know the meaning of the word “all”; for if you did you would *eo ipso* know how to make inferences of this sort’. (Hare 1952, p. 33)

For a much more circumspect statement of a similar viewpoint I turn to Barry Stroud:

There is no doubt that a person’s understanding of what he believes is an essential ingredient in belief, and that his not responding in appro-

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<sup>1</sup> In the light of Cantor’s warnings, W. W. Tait considers him at least foolhardy. See Tait (1997).

priate ways—for example, his not accepting obvious consequences or obviously reasonable conclusions from things he purports to believe or his not changing his alleged beliefs when other things he believes are obviously good reason to do so—is good evidence that he does not understand them and therefore cannot properly be said to have the relevant beliefs at all. ... Certainly if someone saw *none* of the relations between a particular proposition P and others, and was not disposed to accept it even though he already believed what were obviously good reasons for it or to reject it when he believed what were obviously good reasons against it, we would at some point justifiably conclude that he did not understand it. But that shows at most that understanding something requires seeing *some* (perhaps even a great many) of its obvious connections with other things. It does not immediately provide a way of showing, of some particular proposition Q, that the person must see a connection between P and Q if he understands P. As long as he sees enough connections between P and other propositions he could be said to understand P even if he persisted in his non-acceptance of Q. (Stroud 1979, pp. 191–2)

As Stroud sees it, much can go wrong but an individual cannot be wrong all the time. Surely correctly, Stroud holds that there are no inferential connexions she must get right, but, on the other hand, she must get some inferential connexions right some of the time.<sup>2</sup> Given the competence–performance distinction, there is, of course, no inference, however blindingly obvious, that a person cannot get wrong for any number of reasons. Nevertheless, inferentialists about the logical constants may wish to take a line somewhat firmer than Stroud’s, and that for two reasons. Firstly, Geach’s observation suggests that we should get at least simple inferences right much of the time. Secondly, while Hare overstates the case, there would certainly be something more than a little odd in ascribing an understanding of ‘all’ to someone who systematically refused to draw the conclusion from the premisses in most inferences conforming to the pattern:

All As are B  
 c is an A  
 Therefore, c is B.

<sup>2</sup> In a footnote at just this point, Stroud refers to the Ph.D. thesis that became Chermiak (1986) ‘for an argument that a certain minimal consistency and inferential ability is required for the possession of any beliefs, but that does not warrant the specification of particular beliefs or inferences that *must* be accepted’. See Chermiak (1986, especially §2.5).

Neither of these observations rules out the possibility of systematic error on the part of some participants in the practice. What they do suggest is that some systematic errors should be attributed to failures of understanding. Concentrating on the competence side of the distinction, an inferentialist may say that there are certain inferential connections one ought to see in virtue of one's understanding the propositions involved.

The quotation from Stroud mentions belief prominently, so I shall take it as my cue to turn to the matter of how assertion relates to propositional attitudes. We have seen Dudman divorce assertion and belief and Dummett deny that assertion expresses belief, but what of the assertions made and made as intended by a reflective speaker: should they not reflect the speaker's beliefs (or, perhaps better, judgements)? Jennifer Lackey has recently argued that they need not (Lackey 2007). One may, she contends, be nonetheless a *good asserter*. Two examples, among others, that she gives of what she calls *selfless assertion* concern professionals, one a teacher, the other a doctor, who, called upon to pronounce, in their professional capacities, on certain issues, tell their respective audiences the received view in their respective professions, acknowledge the strength of the evidence in favour of the received view, but at the time privately harbour epistemically ungrounded doubts about what they say, doubts they know at the time to be epistemically ungrounded. If there is such a phenomenon as selfless assertion *as a species of correct assertion*, as Lackey maintains there is, assertion *in accord with the norms of assertion*, does it shed any light on the norms governing assertion? Doubtless there can be a speech act in which someone acts as a mouthpiece for a received view. And given the public nature of assertion, such a person may well be taken to have made an assertion. But should we think of this as *correct* assertion or is it more akin to lying?

Recall Dudman's

When a speaker affirms a proposition, for example, I construe that as her incurring public commitments to its truth, not as her confiding private belief in its truth. (Dudman 1991, p. 228, n. 14)

This clearly leaves room for Lackey's selfless asserter. The asserter is construed as incurring public commitments to the truth of what she says; we do not, he says, construe her as confiding private belief in its truth. While the public commitments are discharged if she with-

draws her assertions, someone who *always* backs down when faced with a challenge is not ‘playing the game’—like someone who resigns immediately in every game of chess, she seems to have lost sight of the point of the practice. Defending—or, perhaps better, shoring up—one’s assertions is the default; withdrawing an assertion indicates at least apparent acknowledgement of a failure to fit with the aim. A selfless asserter may maintain the pretence when challenged and elaborate the received view. In doing so there is perhaps an element of deception, for she is construed as *voluntarily* having taken on (public) commitments to the truth of what she says. In maintaining the deception, the speaker represents herself as endorsing what she says. We must look more closely at the purpose of the public commitments taken on in assertion to see whether there is anything wrong in the selfless asserter’s practice.

We get a clue to the point of the public commitments taken on in assertion from Richard Foley’s defence of the rational acceptability of all of a set of jointly inconsistent beliefs. Foley, like many in the light of Kyburg’s Lottery Paradox, holds that the rational agent may be entitled to inconsistent beliefs. Foley, however, distinguishes a subclass of beliefs, namely those the agent may use as evidence:

This is not to say that the discovery of inconsistency is ever epistemically irrelevant. It isn’t. Inconsistency is always an indication of inaccuracy, and because of this, it would be a mistake to base further inquiry on a set of propositions that you know to be inconsistent. It would be a mistake, in effect, to make all of these propositions part of your evidence, since this would risk spreading the error to yet other propositions. (Foley 1992, p. 119)

Foley has in mind an individual’s own evidence. Nevertheless, he has provided the essential pointer: I suggest that Dudman’s ‘fundamental dialectical requirement’ is a fundamental requirement exactly because in asserting a proposition one is putting it forward for use by others as evidence in their own deliberations. Evidence must not only be consistent, what follows from evidence can also be used as evidence—hence we obtain the two dialectical constraints. And so much of what we take ourselves to know is based on the testimony of others, on what others have presented as evidence that we can build on.

Testimony allows for collaboration. As Christopher Cherniak puts it,

Individuals differ not only in exotic expertise but more commonly in being in better or worse positions to know particular things, by virtue of their current background and perceptual history and perspective. The hypothesis of the nonuniform distribution of belief or information in the community at any given moment motivates generalizing Putnam's 'division of linguistic labor' to a distribution of cognitive labor: in that wider way, two, or  $n$ , heads are better than one. (Cherniak 1986, pp. 104–5)

As Cherniak goes on to observe,

Of course, this highly structured information-propagation procedure works on the assumption that when an utterer makes an assertion, others can rely on it as more than a random guess. The usefulness of the whole system would wither if members did not generally attempt to meet, and could not expect others to meet, standards of trustworthiness in making assertions. (Cherniak 1986, p. 105)

That the standards of trustworthiness involve more than that the speaker merely believe what she says, as hinted at, I think, by Cherniak's 'random guess', is not a novel point. Isaac Levi, for whom accepting as true is believing, drew attention to this some time ago when he distinguished what one accepts as true from what one accepts as evidence: evidence meets higher standards than belief:

If we are to attempt to justify accepting one sentence or set of sentences by an appeal to others already accepted, the set of sentences to which the appeal is made should be accepted as not only true but as evidence. Although acceptance as true is a necessary condition for acceptance as evidence, the converse does not hold. A medical research worker might believe in Enovid's freedom from deleterious side effects yet he might with good reason continue to conduct tests of its safety. While he may believe that it is safe, he surely cannot take that hypothesis as evidence in the context of testing. (Levi 1967, p. 28)

As Foley, so Levi has an individual's own evidence in mind but when we tie this higher standard for evidence to the putting forward as evidence in assertion we take a step towards an explanation of a passing observation of Donald Davidson's:

Someone who makes an assertion represents himself as believing what he says, and perhaps as being justified in his belief. (Davidson 1984, p. 268)

In assertion taken to be sincere the maker of the assertion will come across as (1) believing what she says, (2) believing that she believes it, and (3) believing that her belief in what she says is justified. That this is so is a feature of the practice of assertion. In asserting a proposition, and thus putting it forward for use as evidence by others, the speaker represents herself as having a justified true belief, a belief she can back up if challenged (or, failing that, withdraw). In doing so she represents herself as meeting standards of trustworthiness governing assertion. (She does not express any of the three beliefs she represents herself as having.)

Remember that Lackey's selfless asserter is in a situation in which she is obliged to pronounce one way or the other on a matter within her professional competence. Possessing a strong but knowingly ungrounded belief that the received view is mistaken, she opts to go along with the received view, which she knows to be well supported by the evidence. Since she is obliged to make an assertion, the most we can expect of her in circumstances that may be less than ideal is that she does her best to conform to the norms governing assertion. And this is exactly what she does in going with the received view; she better conforms to the requirements of trustworthiness in doing so, even though she does not believe what she says. Assertion, to repeat, does not express belief. What Lackey's examples show is that this may be so even for assertions made and made as intended by a reflective speaker. (One may nonetheless feel that the selfless asserter should indicate that she is temporarily acting as a mouthpiece for a view. This is not to say that she must make it explicit that she does not herself hold the view, for that might undermine the selfless assertion. Still, perhaps some small flag should be raised. There is nothing odd about assertions so qualified: teaching just about any discipline is full of them.)

Justified true belief has a familiar ring to it. It is, then, perhaps no coincidence that Elias Thijssse arrived at an analysis of assertoric force according to which when one asserts that *A* one believes that one knows that *A* (Thijssse 1987, cited van Benthem 1988, p. 45). What is asserted, what is said, is that *A*; what is conveyed or implied in asserting that *A* is that one believes that one knows that *A*.

That assertion expresses belief is a thesis of G. E. Moore's, advanced in explanation of what we nowadays call Moore's Paradox. But Moore was well aware that not all assertion expresses belief. We have already seen him give reasons for exactly not taking asser-

tion to *express* belief. As far back as his *Ethics* of 1912 Moore had this point firmly in view:

If, for instance, I say, 'A is B,' and mean what I say, what I *mean* is always merely that A is B; but those words of mine will always also *express* either the fact that I *think* that A is B, or the fact that I *know* it to be so; and even where I do not mean what I say, my words may be said to *imply* either that I think that A is B or that I know it, since they will commonly lead people to suppose that one or other of these two things is the case. (Moore 1912, p. 125)

'Imply' here nicely helps fill out how 'represents' is to be read when, above, we said that in making an assertion a speaker represents herself as having a justified true belief, and so represents herself as meeting standards of trustworthiness governing assertion: following Moore, she implies this.<sup>3</sup> Unfortunately, the claim that assertion expresses belief is well embedded in the literature. But that assertion should imply (or, as others say, express) only belief, and not, say, belief that one knows, leaves mysterious a phenomenon to which Elizabeth Wolgast does well to draw attention:

Saying that the cat has been fed is different from saying one thinks that the cat has been fed. Yet if the former expresses belief, shouldn't these be equivalent? What is the difference? If you compare the sentences, you observe that one is weaker than the other. The flat statement is stronger; saying one believes or thinks the cat has been fed is weaker than saying it has been fed. If someone says he believes the troops are advancing, he is being more tentative than if he said flatly that they are advancing. Furthermore, the more he emphasizes the word 'believe,' the more his qualification is being emphasized. In saying he believes, he is expressing less conviction than if he said nothing about belief at all. (Wolgast 1977, p. 114)

To explain this phenomenon Wolgast is forced to answer her own question by maintaining that, as assertion itself implies belief, the phrase 'I believe' performs the special function of signalling the implying of a weak belief. Note the oddity, if I read her aright, of Wolgast's explanation: when I assert 'I believe the troops are advanc-

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<sup>3</sup> To be sure, Moore says it is the speaker's *words* that express or imply that she believes or knows that which she says. But given what he says the words mean, it must be the speaker's saying of them that expresses or implies, not literally that which is said (for said by another it would not have the same implication).

ing', I do say that they are advancing and imply that I believe this only weakly, the more weakly the more I emphasize 'believe' in my act of assertion. Notice too that by Wolgast's account of the matter, if one is not to be credited with simultaneously, with one utterance, saying two different things and implying two different things (both different from what is said), there must be some convention that stops it being the case that I am not at the same time reporting that I have a certain belief and implying that I have an ordinary full strength belief that this is so. (And since I surely ought to be able to do the latter on occasion, there must also be a conventional means at my disposal of signalling that that first convention is being cancelled.) As the beliefs that find expression in assertion are usually beliefs one is aware one has, we have a much more straightforward explanation of the phenomenon Wolgast indicates if we look to Thijsse's analysis: on the whole it's a lot easier to come to believe that one knows one believes that  $p$  than it is to come to believe that one knows that  $p$ .

Thijsse's analysis ties in nicely with a thesis notably propounded by Keith DeRose (1996) and by Timothy Williamson (1996), namely, that *one is entitled to assert what one knows*, for in attempting to comply with this norm one will take oneself to be entitled to assert a proposition just in case one believes that one knows it. Thus while the norm prescribes that one is entitled to assert what one knows, one's practice in attempting to comply with that norm will be to assert what one believes one knows. Notice that Williamson argues against taking the norm governing assertion to be: *one is entitled to assert what one believes one knows* (Williamson 1996, pp. 512–13). I am taking Thijsse's account as a description of what one does when one tries to comply with Williamson's own preferred norm. Care in distinguishing between the norm and what one does in the attempt to comply with it takes care, I think, of arguments put forward for a norm of assertion along the lines of: *assert only what one rationally believes one knows* (see, e.g., Brown 2008).<sup>4</sup> Moreover, this is a norm to which one aspires. Required to make an assertion, Lackey's selfless asserter does her best to conform (by going with the evidence favouring it), even though, in

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<sup>4</sup> In like manner, if the norm for assertion were *assert only what is true*, the *practice* would be to assert only what one believes. Notice that the knowledge norm entails that one asserts only truths, whereas the norm that says *assert only what one rationally believes one knows* does not; the truth norm would be a separate constraint on assertion.

temporarily not believing the received view she falls at the first hurdle as far as knowledge is concerned. As I see it, Lackey's examples furnish no grounds for rejecting knowledge as the norm for assertion.

We should note that in English the commonest way in conversation to put a mild challenge to a speaker is to say, 'How do you know that?' (It's a question one can ask oneself in reflective mood.) The status as knowledge is not contested outright but information is requested to justify that status. More hostile questioning does contest the status as knowledge: we say, 'Why do you say that?' or 'What makes you say that?' or even 'Do you really believe that?'—and supporting the point that belief is not sufficient for assertion, we should note that one way *to withdraw* an assertion is to say, 'I don't have a good argument for that but I still believe it anyway.' In saying this one is backing down from blunt, unqualified assertion.

It would be tedious, to say the least, if all of one's assertions were met with the question, 'How do you know that?' A challenge ought to be grounded in reasonable suspicion or doubt—another aspect of the practice of assertion. Doubts may depend on knowledge of the subject matter or knowledge of the speaker. It is no simple task to say what counts as reasonable doubt.<sup>5</sup> And what counts as an adequate response may depend on shared background beliefs, knowledge of the speaker, and—borrowing from contextualist accounts of knowledge—what may be at stake in accepting the testimony of another. I take myself to know that Albany is the state capital of New York and Sacramento the state capital of California. Were you to ask me how I know, I would have to say, 'I don't know how I know. These are things I've known for a long time. I don't remember how I came to know them.' If not a lot hangs on it and you regard me as, even perhaps know me to be, generally a reliable source of truths, it may suffice that I repeat my claim to knowledge. If the stakes are high, you may seek confirmation elsewhere or even discount my having said anything on the matter, regarding me as having failed to establish that I meet the requisite standards of trustworthiness on the matter (although I'll be miffed if you do that).

As a final step, putting the knowledge norm together with the thought that in making an assertion one is putting forward what

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<sup>5</sup> See, for example, Cherniak 1986, ch. 5.

can be used as evidence by oneself and others, we obtain the normative constraint that one's evidence is among what one knows. And since, presumably, knowledge meets whatever higher standards are needed for evidence over and above belief, we obtain another thesis for which Williamson has argued, namely that one's evidence is what one knows (Williamson 1997).

The story just told, cobbled together as it is from diverse sources, hangs together rather well (albeit that much, much more could be said—and has been said by others—on any of the matters mentioned). We have an overt *normative* role for logic in governing assertion. Assertion aims at truth *and* is a matter of putting forward propositions for others to use as evidence in the furtherance of their epistemic projects. One's own evidence is what one knows and that is what one may assert. One will then assert only what one takes oneself to know; and since the consequences of truths are truths, one must implicitly take the consequences of what one takes oneself to know to be true. In making the assertions one is committed to standing by these consequences or withdrawing one or more of the assertions. Contesting a logical consequence of assertions made is, then, a way of asking the speaker to show that she has complied with the norms governing assertion.

One might well think the knowledge norm for assertion too taxing, even inoperable, despite 'How do you *know* that?' being the standard challenge. Absent the KK principle and going back to the quote from Davidson, one might hold that justified true belief is the appropriate norm. This weaker constraint may appeal particularly to those who maintain that justification is internal. An assertion challenged, the speaker must withdraw the assertion or provide a defence and the latter certainly looks like an internalist undertaking: individuals rise to the challenge and offer reasons for accepting what they have asserted. That one's assertion may be justified by external factors unknown does one little good in the dialectical setting of assertion: it is not enough that one's assertion *be justified*, a justification has to *be provided*. However, as we have seen, what counts as a response to a reasonable challenge may be something quite weak: perhaps no more than a claim by the speaker to know, not merely believe, or a pointer to past reliability. Moreover, justifying an assertion is a task that may be taken up by others; the speaker's burden may be shared. Be that as it may, I should point out that for present purposes it matters little whether the norm for assertion is

knowledge or justified true belief. What matters is that both entail the truth norm and both have it that in making an assertion the speaker represents herself as being in a stronger epistemic position than merely believing what she asserts.<sup>6</sup>

Does the normative role of logic in governing assertion feed back into a normative role with respect to an individual's propositional attitudes and, in particular, belief? Certainly, one should not form beliefs in such a way that one is led often to contravene the norms of assertion. That much, surely, goes without saying, but that is in part because it says little. Assertion must be allowed to include dialogue with oneself, and the frequency of contravention must be in relation to one's own assertions, or else by refraining from saying much one could comply. But with those qualifications in place we yet do not have a strong constraint here, for, as we have seen, there is no straightforward connection between belief and assertion.

Two facts help us out. Firstly, Stroud indicates that some grasp of logical connexions is required for the very possession of beliefs. Secondly, at least those beliefs that constitute one's evidence are candidates for assertion and should be policed internally as they would be were they to be offered as evidence to others in assertion. The reason for this is that one should treat one's own evidence as one would that proffered by others. Consequently, when a logical consequence of those beliefs one holds, as we might say, *responsibly*, becomes salient, one should either accept it or disown one of one's beliefs. This is close to Millar's *Implication Commitment Principle*:

For any  $x$ ,  $\pi$ , if  $x$  believes  $\pi$ , then for any  $\theta$ , if  $\pi$  implies  $\theta$ , then  $x$  incurs a commitment to believing  $\theta$ , if  $x$  gives any verdict on  $\theta$ . (Millar 2004, p. 109)

As it stands, this speaks only of consequences of beliefs taken individually. I am not at all sure Millar intends that restriction. When he first discusses the normative commitments incurred by believing, he says the following:

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<sup>6</sup> One takes on public commitments to the truth of consequences of what one asserts. If knowledge is the norm for assertion and, as some maintain, knowledge is not closed under known entailment, one may end up committed to the truth of a proposition that one is not entitled to assert. This may seem odd—it does to me—but I am not (yet) convinced that it signals outright incoherence. A challenge to a consequence is a challenge to what one has asserted—that's the important point.

Suppose that I believe

(a) Whenever there is frost on the ground it has been freezing.

Since I have this belief, I incur a commitment to accepting whatever is implied by (a) and whatever is implied by (a) taken along with other things I believe. ...

The basic *implication commitment*, as I shall call it, gives rise to derivative implication commitments, depending on what is implied by (a) and by (a) together with other things I believe. For example, in virtue of believing (a), and believing

(b) There is frost on the ground

I incur a commitment to believing

(c) It has been freezing. (Millar 2004, pp. 72–3)

Millar goes on to explain,

When fully specified, the commitment to (c) incurred by believing (a) and (b) is a commitment to believing (c) *if one gives any verdict on (c) at all*. The verdicts are believing (c), disbelieving (believing the negation of) (c), and withholding both belief and disbelief from (c). The latter is to be understood as a definite verdict—taking a stance on (c)—rather than as simply the absence of both belief and disbelief. ... I can *discharge* the commitment incurred by believing (a) and believing (b) in one of two ways: by ensuring that I do not give a verdict on (c) other than belief, or by giving up belief in either (a) or (b). (Millar 2004, pp. 73–4)

Reading the principle in the stronger way that seems to be intended in the talk of derivative principles, i.e. as governing consequences of beliefs taken collectively rather than taken individually, the significant difference then becomes that Millar takes his Implication Commitment Principle to apply to all beliefs. But if an individual can rationally have inconsistent beliefs, this would not be good.

Can a rational individual have inconsistent justified beliefs? Perhaps the Preface Paradox provides the best case in favour. Certainly David Christensen (2004) devotes a fair bit of space to it in arguing that beliefs need be neither consistent nor closed under logical consequence. He says, ‘Preface cases present dramatic examples in which our ordinary assertion practices violate cogency quite flagrantly’ (Christensen 2004, p. 74), *cogency* being his term (originating in Levi 1967) for Dudman’s dialectical requirements of consistency and deductive closure. An author is taken to assert the propositions contained in the body of her work; she modestly states

in the preface that undoubtedly the work contains at least one error. In doing this she clearly sins against one of Dudman's fundamental dialectical requirements: consistency. But isn't she reasonable in doing so? An observation of Cherniak's serves, contrary to his intention, to undermine the apparent reasonableness:

The seemingly overlooked point that is of interest here is that the *size* of the belief set for which a person makes the statement of error *F* determines the reasonability of his joint assertions. If he says, 'Some sentence in  $\{p\}$  is false, and  $p$ ', this seems clearly irrational, like saying, 'I am inconsistent; I believe both  $p$  and not- $p$ '. If he says, 'Some sentence in  $\{p, q\}$  is false, and  $p$ , and  $q$ ', this is similarly unacceptable. But if the set is very large, and in particular encompasses the person's total belief set, then accepting *F* along with that belief set becomes much more reasonable. (Cherniak 1986, p. 51)

True enough, in some respect it is *more* reasonable the larger the set of propositions considered. But there is no number above which it is reasonable to assert all the propositions in the body of the work *and* the modest claim to error in the preface. Either there is an error in the body of the work, or the claim in the preface is mistaken. Either way, it is known that there must be at least one error somewhere, and so, to echo Foley's words, it would be a mistake to make all of these propositions part of your evidence (and as they are not all part of one's evidence, they cannot all be asserted). If it is a mistake when there is only one proposition in the body of the work, and a mistake when there are only two, then it is not unqualifiedly the right thing to do when there are ten, or twenty, or a hundred, or ten thousand, or a billion.

Scientists, it is often said, work with inconsistent theories: individual theories that are inconsistent with what Kuhn calls anomalies, or pairs, or triples, and so on, of theories that are jointly inconsistent. Rutherford's model of the atom was spectacularly inconsistent with the classical theory of electromagnetism and the known stability of hydrogen atoms:

Physics faced another great embarrassment in 1911. Ernest Rutherford had convincingly argued that atoms consist of electrons orbiting a positively charged nucleus, much like a miniature solar system. Electromagnetic theory, though, predicted that orbiting electrons would continuously radiate away their energy and spiral into the nucleus in about a trillionth of a second. Of course, hydrogen atoms were known to be eminently stable. Indeed, this discrepancy was the worst quanti-

tative failure in the history of physics—underpredicting the lifetime of hydrogen by some 40 orders of magnitude. (Tegmark and Wheeler 2001, p. 70)

Bohr quantized the Rutherford model, restricting permitted orbits by quantizing angular momentum to certain allowed values. He then just denied that electrons in those orbits radiate energy even though their orbital motion is accelerated motion. Graham Priest has made much of this, taking Bohr's theory of the atom as a striking example of an empirically fruitful, inconsistent theory (Priest 2006, pp. 145–8). The crucial question is whether scientists *believed* the theory. Priest himself says, 'Now, no one ever thought that Bohr's theory was correct' (Priest 2006, pp. 205–6). There is a fine point here about the propositional attitude scientists adopt when they work on theories. Is it belief in truth? Is it belief in approximate truth? Is it some form of acceptance other than belief, say acceptance as a premiss in one's deliberations (Cohen 1992, pp. 4–27) or tentative acceptance as a working hypothesis (Harman 1986, pp. 46–7)? To say the least, it is not at all obvious that it is belief (and even were it belief, that it would be rational belief) (cf. Christensen 2004, §4.2; Engel 2000).

So where we have got to is this. Logic has a normative role in determining the commitments taken on in assertion. Logic also has a normative role in determining the commitments undertaken in holding those beliefs that constitute one's evidence, those beliefs that are candidates for expression in assertion, and may expand out to the commitments entered into in holding any beliefs (but I certainly have not said enough to justify that claim here). And some grasp of logical connexions is implicated in the very having of beliefs.

## II

The fly in the ointment is degree of belief. I take myself to know that Albany is the state capital of New York and Sacramento the state capital of California. I am much less confident that Bismarck is the capital of North Dakota. Indeed, were you to ask me the capital of North Dakota, I would say, 'It's Bismarck, I think.' And if you ask me the capital of Missouri I'd respond with a guess, I have nothing worth calling a belief as to which city is the capital (though I'm damn sure it's not Moberly).

Belief comes graded. That poses a problem for making any connexion between belief and assertion, for assertion does not. (Assertions may be qualified with ‘I believe’, ‘I think’, but there are not degrees of assertion.) The orthodoxy for long was that sufficiently high degree of belief sufficed for assertion. Lotteries pose a severe problem. Dudman takes it as just obvious, since there is a possibility, however slim, that any given ticket will win, that one cannot assert ‘My ticket won’t win’, however great the number of tickets in the lottery. His conclusion:

[I]f there is a ‘rule of assertion’, it cannot be to assert what is highly probable. (Dudman 1992, p. 205)

Others have needed a little more persuasion. Here’s one way to think about it. Suppose the threshold for assertion is  $1-\epsilon$ . Then, assuming degrees of belief behave as probabilities, the minimum probability/degree of belief the conjunction of  $n$  propositions achieving the threshold can have is either  $1-n\epsilon$  or 0, whichever is the greater. And what that means is that, as a function of  $\epsilon$ , there is a number  $m_\epsilon$  which is the least number of jointly inconsistent assertions one can rationally make. The smaller  $\epsilon$ , the larger the sets of inconsistent propositions that are ruled out for joint assertion. As Christensen says, regarding belief rather than assertion, but the point translates,

[C]onsidered apart from the probabilistic constraints, there’s nothing attractive about principles that one can believe inconsistent sets of beliefs only so long as they contain at least 17, or at least 117, members. (Christensen 2004, p. 26)

The Lottery Paradox (Kyburg 1961, p. 197) ensures that, whatever the value  $m_\epsilon$ , there are sets of jointly inconsistent propositions each of which attains the threshold. Even if one holds that the threshold is fuzzy and/or context-sensitive, it will still be the case that small sets of inconsistent assertions are not okay and large sets are—and that is surely unacceptable.

High probability need not transfer from the premisses to the conclusion of a logically valid argument. Indeed, it may well be that the negation of the conclusion of a valid argument has a probability at least as high as any of the premisses (as happens in the Lottery Paradox). Gilbert Harman has noted how odd it would be to engage in dialogue with someone who is guided solely by degree of belief. He goes so far as to state that it would be ‘contrary to the way we nor-

mally think' (Harman 1986, p. 23). He says,

Imagine arguing with such a person. You might get him to believe certain premises and to appreciate that they imply your conclusion, but he is not persuaded to believe this conclusion, saying that, although you have persuaded him to assign a high probability to each of your premises, that is not enough to show he should assign a high probability to the conclusion! This is not the way people usually respond to arguments. (Harman 1986, p. 23)

Now, it may well be that the conclusion does not enjoy a high probability, even though the premisses taken individually do. Nevertheless, if the premisses are either asserted or taken as evidence, the norms governing assertion and belief require that one stand by the conclusion or withdraw one or more of the premisses. Supposing there is no good reason to withdraw any of the premisses, we find ourselves in a seemingly problematic situation. If we ever have beliefs which are highly probable but not certain, the norms governing belief seem to require us to do something *epistemically irresponsible*: to believe highly improbable propositions—and these can be improbable by the epistemic agent's own lights. Likewise, if we ever assert propositions which are highly probable but not certain, the norms governing assertion require us to take on commitments to the truth of highly improbable propositions—and, again, these can be improbable by the epistemic agent's own lights.

The appearance of epistemic irresponsibility can, I think, be mitigated to a certain extent. The conclusion of a valid argument cannot be any less probable than *the conjunction* of its premisses. While taken individually each premiss is highly probable, collectively they may be much less so. And that is just in the nature of probability: the improbability of the conclusion merely makes salient the joint improbability of the premisses. But if, taken individually, they are believed or asserted responsibly, the mere improbability of some conclusion reached from them does nothing to impugn them. Still, there is something more than a little unsettling here. Why should one take on commitments to believe or to stand by propositions in whose negations one has a vastly greater degree of belief? And we *do* take on these commitments. As Harman observes, we take deduction from individually plausible premisses as providing reason for belief (cf. Kaplan 1996, p. 97). Our reaction is *not* as Dummett says it should be:

Philosophers discussing the concept of belief sometimes speak of an ideal subject as one who believes all the logical consequences of his beliefs; but, unless we make the further idealization that he has only true beliefs, there is nothing ideal about him. Most of our beliefs are perforce based on grounds that fall short of being conclusive; but a form of inference guaranteed to preserve truth is not, in general, guaranteed to preserve degree of probability. This is already obvious for the rule of and-introduction: the conjunction of two statements will usually have a probability lower than either. The 'ideal' subject, starting from beliefs whose probability is close to 1, will end up with beliefs with probability negligibly greater than 0; the man of common sense, initially adopting beliefs with a much lower evidential basis, but reasoning from them only to a meagre extent, will finish with far fewer false beliefs than he. That is why scientific conclusions arrived at by long chains of impeccable reasoning from highly probable initial premises almost always prove, when a direct test becomes possible, to be wrong. That is not a ground for discouraging scientists from pursuing their chains of inferential reasoning: only so will they discover that, contrary to probability, one or more of their premises is false. It is a ground only for refusing any credence to the conclusions they reach. (Dummett 1991, p. 50)

The fact of the matter is, as Harman indicates, we are not guided solely by degree of belief in our reaction to the conclusion of a chain of inferential reasoning. Were Dummett right, we would ever be amazed that any sophisticated scientific theory makes *any* correct predictions—and, I submit, we are not.<sup>7</sup>

Maximal probability does transfer from multiple premisses to conclusion of a valid argument, but taking as beliefs only those propositions to which the agent assigns degree of belief 1 is usually thought to be far too stringent a criterion (cf. Kaplan 1996, pp. 91–3; Christensen 2004, p. 21).<sup>8</sup> High probability does not transfer,

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<sup>7</sup> Christensen takes Dummett's line when he says, 'But probabilistic coherence does not force a rational agent who strongly believes each of the individual premisses considered separately to believe the conclusion at all strongly,' and goes on to say, 'For believing each of the individual premisses—even strongly—does not rationalize strongly believing their conjunction' (Christensen 2004, p. 82). We can agree with the first claim, but Harman's point is that the second is contrary to the way we normally think.

<sup>8</sup> The rubric *assert only what is maximally probable* would come closer to what Dudman insists on: that 'assertibility goes out the window as soon as the underlying thought is reduced to relying on "mere" probability'. Absence of possibility to the contrary is, he suggests, needed for assertibility (Dudman 1991, p. 205).

that much is true, but something we value epistemically does to such an extent that it overrides the diminution of probability in the passage from premisses to conclusion. Or, at least, this is so if (i) we assign only high, not maximal, degree of belief to some of the beliefs in our evidence, and (ii) the graded structure of degrees of belief is sufficiently akin to that of probability for these probabilistic considerations to translate.

Orthodoxy forges some connexion between degrees of belief and betting behaviour in the attempt to substantiate the probability-like behaviour of degrees of belief. Is there good reason to do so? I think there is. One evaluates the odds at which bets are offered in the light of one's assessment (assaying, weighing) of evidence. It is, in the first instance, the odds one assesses. One can perfectly well say 'Those are good odds for a bet on *A*' without having the least intention of actually making a bet oneself. This assessment is independent of any stake. In principle one holds the odds good no matter the stake, *as far as an assessment of the odds goes*. In practice, how much one might be willing to bet depends on all sorts of considerations. But if stakes are kept small, we get some approximation to the in-principle case. Let us, then, go a certain way with Christensen and accept that when stakes are small a reflective, rational agent's degrees of belief *sanction* certain bets as acceptable (cf. Christensen 2004, p. 117). More exactly, degrees of belief sanction certain *odds* as acceptable/not disadvantageous and one may be prepared to bet at those odds when the stakes are small. When one assesses favourably odds on all of a family of propositions, bets at those odds are, *in principle*, acceptable no matter the stakes proposed. It should not then be the case that stakes can be chosen so that one faces certain loss; it should not then be that one's evaluation of odds as acceptable/not disadvantageous permits a rationally defective betting strategy.<sup>9</sup> This is a normative constraint: one's evaluation of odds is rationally criticizable if it can lead to certain loss.

Assertion implies belief. Evaluation of odds, I want to say, *implies* degree of belief. We need some convention-governed practice that allows, some of the time, expression of degrees of belief, and this must be a practice that admits gradations. Of course, as with

<sup>9</sup> For a *simple* agent, a set of bets that is logically guaranteed to leave her monetarily worse off is rationally defective (Christensen 2004, p. 118.) An agent is simple in Christensen's sense if she values money positively and linearly with respect to monetary value.

assertion, there need be no straightforward connexion between degrees of belief and assessment of odds. Thus one cannot, as a certain tradition has tried to do, *operationalize* degree of belief through betting. Nevertheless, much of the time, assessment of odds and, indeed, betting behaviour reflects degrees of belief. Evaluation of odds is one manifestation, admittedly a highly conventionalized one, of our engagement with an uncertain world.<sup>10</sup>

Normalizing odds to betting quotients, there are two ways one can bet concerning the truth of a proposition: on or against (or, in terms of conventional roles, as bettor or as bookie). With betting quotient  $p$  and (positive) stake  $S$  the pay-offs for a bet concerning the truth of  $A$  are

	$A$	Not- $A$
On/Bettor	gains $(1-p)S$	loses $pS$
Against/Bookie	loses $(1-p)S$	gains $pS$

For fixed  $S$  the bet is acceptable to the rational agent when taking the bettor's role when  $p=0$ , for there is no prospect of loss and (perhaps) a possible gain; as  $p$  increases the possible gain diminishes and the possible loss increases, making the bet progressively less appealing. Consequently, either 0 is the only acceptable betting quotient and we set  $P^*(A)=0$  or there is a real number  $P^*(A)$  such that, for all  $p$ ,  $0 \leq p < P^*(A)$ , the bet with betting quotient  $p$  is acceptable but no such bet with a betting quotient greater than  $P^*(A)$  is acceptable. Likewise, the bet is acceptable to the rational agent when taking the bookie's role when  $p=1$  and either 1 is the only acceptable betting quotient and we set  $P^*(A)=1$  or there is a real number  $P^*(A)$  such that, for all  $p$ ,  $P^*(A) < p \leq 1$ , the bet with betting quotient  $p$  is acceptable but no such bet with a betting quotient less than  $P^*(A)$  is acceptable.

If  $P^*(A) < P_*(A)$  then there are a pair of numbers  $p$  and  $q$  with  $p < q$  such that the agent is willing to play the bookie's role for a bet with stake  $S$  at betting quotient  $p$  and play the bettor's role for a bet with stake  $S$  at betting quotient  $q$ . Accepting both bets at the same time, the agent faces certain loss of  $(q-p)S$ . Hence rationality re-

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<sup>10</sup> Just as assertion is not the only way beliefs are expressed or implied, so too evaluation of odds is by no means the only way degrees of belief are expressed or implied.

quires that  $P_*(A) \leq P^*(A)$ .<sup>11</sup>

Does rationality require that  $P_*(A) = P^*(A)$ ? I am going to float an argument that suggests it might, but the argument appeals to a couple of principles at least one of whose status is questionable. In swapping roles the bet *reverses*: bookie's gain is bettor's loss and vice versa. We need to appeal to two principles. Firstly, if a rational agent regards a bet, or family of bets, as disadvantageous, there is some (positive) sum which she regards it preferable to pay rather than to participate in the bet. Obviously the sum can be no greater than the maximum she can lose in the bet and may well be considerably smaller, but the claim is there should be some such sum. Secondly, if an agent prefers one bet to another or one family of bets to another then when all the bets are reversed, her preference should reverse too. That is, using  $-\mathcal{A}$  to denote the family of bets obtained by reversing all bets in the family  $\mathcal{A}$ , if she prefers  $\mathcal{A}$  to  $\mathcal{B}$  then she prefers  $-\mathcal{B}$  to  $-\mathcal{A}$ . Why should this be so? For sufficiently small stakes, the agent values money proportionately to monetary value. Under reversal, all gains become losses of exactly the same magnitude and all losses become gains of the same magnitude, so the comparison of gains and losses on various outcomes just inverts. Other than to note that these two principles are weak consequences of standard expected utility theory,<sup>12</sup> I shall not argue for them further.

Now, if  $P_*(A) < P^*(A)$  then there are values of  $p$  for which the agent regards both sides of the bet on the truth of  $A$  at betting quotient  $p$  with stake  $S$ —both the bettor's and bookie's roles—as disadvantageous. So there are (positive) sums she'd pay rather than take part in both bets, viewing as two bets her taking of one role and the other. As she values money positively, if she is prepared to pay some small sum to avoid participating in a bet, she is certainly prepared to pay a smaller amount or even, better still, to be paid not to participate. We view a payment as a degenerate bet with one certain outcome. So let  $\mathcal{A}$  be the bet from bettor's perspective,  $-\mathcal{A}$  the same bet from bookie's perspective, and  $\mathcal{B}$  the payment of some sum the

<sup>11</sup> It is at this point that one may suspect rather more is written into the conception of betting than was made transparent above. Loss is certain if  $A$  and not- $A$  exhaust the possible outcomes: this they are normally taken to do. Furthermore, it may seem that it is assumed the bet can be settled but this, I think, is not so. It suffices to be called on certain loss if one has favourably assessed odds so that were bets at appropriate stakes to be made and were they to be settled, there is a minimum amount that would be lost come what may. That suffices to show the assessment of odds rationally defective.

<sup>12</sup> Under the assumption that, for the stakes involved, utility is proportional to money.

agent finds it acceptable to part with to avoid either one of the bets. The agent prefers  $\mathcal{B}$  to each of  $\mathcal{A}$  and  $\neg\mathcal{A}$ , and she prefers  $\neg\mathcal{B}$  to both. So she prefers  $\mathcal{B}$  to  $\mathcal{A}$  and she prefers  $\neg\mathcal{B}$  to  $\neg\mathcal{A}$ . But by the second principle, the reversal of preference under reversal of bets, she prefers  $\neg\mathcal{A}$  to  $\neg\mathcal{B}$ . Her preferences are incoherent: she cannot both prefer  $\neg\mathcal{A}$  to  $\neg\mathcal{B}$  and prefer  $\neg\mathcal{B}$  to  $\neg\mathcal{A}$ .

Given our two principles,  $P_*(A) = P^*(A)$ . This is rationally required if the two principles are principles of rationality. Are they? I have no view on how to settle that question. I will say only that *if* risk aversion is rationally permissible, reversal of preference under reversal of bets is not a requirement of reason. So I shall take it in the sequel that a case has not yet been made for identifying  $P_*(A)$  with  $P^*(A)$ .

Dutch Book Arguments, suitably de pragmatized, one trusts,<sup>13</sup> place constraints on the functions  $P^*$  and  $P_*$ , distributions of upper and lower probabilities respectively.<sup>14</sup> Considering only pay-offs, a bet as bookie at betting quotient  $p$  and stake  $S$  on the truth of  $A$  just is a bet as bettor at betting quotient  $1-p$  and stake  $S$  on the truth of not- $A$ . Consequently, we have that

$$\text{for any } A, P^*(A) + P_*(\text{not-}A) = P^*(\text{not-}A) + P_*(A) = 1.$$

If the functions  $P^*$  and  $P_*$  are defined over a field of propositions closed under negation, the values of one can therefore be inferred from the values taken by the other. Even so, and even more than in the case of ordinary probability distributions, distributions of upper and lower probabilities are computationally intractable.

Analogously to assertion and belief, a rational agent should endeavour to make her publicly made evaluations of odds, and, correlatively, her degrees of belief, conform to whatever is required by Dutch Book Arguments—and, perhaps, more generally, constraints on expectations—when these requirements come to her attention. In particular, then, when it comes to her attention that an argument is deductively valid and she has assessed odds so as to fix her upper and lower probabilities for the conjunction of the premisses, her up-

<sup>13</sup> We seek constraints on epistemic rationality, not prudential, hence the need to ‘depragmatize’. There is now an extensive literature on depragmatizing Dutch Book Arguments. See Christensen 2004, §§5.2–5.3, for a discussion.

<sup>14</sup> The details are formidable and special problems attend the use of upper and lower probabilities that have no parallel in the case of ordinary probability distributions. The standard reference in the area is Walley (1991).

per (lower) probability of the conclusion cannot be less than the upper (lower) probability of that conjunction.

In virtue of having graded beliefs in propositions, *some* logical connexions ought to manifest themselves in the agent's degrees of belief. In this regard, a constraint like Field's (D\*) (Field 2009, p. 259)

If it's obvious that  $A_1, \dots, A_n$  together entail  $B$ , then one ought to impose the constraint that  $P^*(B)$  is to be at least  $P^*(A_1) + \dots + P^*(A_n) - (n-1)$  and likewise for  $P_*$

seems appropriate, for it is too much to assume that whenever she has degrees of belief in the premisses she also has a degree of belief in their conjunction. Here obviousness may be read in terms of those inferential connexions one ought to see in virtue of one's understanding the propositions involved.

There is a more elegant formulation of (D\*). Take the functions  $U^* = 1 - P_*$  and  $U_* = 1 - P^*$  to be upper and lower measures of uncertainty (or improbability). Then we get

If it's obvious that the premisses of a valid argument entail the conclusion then one ought to impose the constraint that the upper (lower) uncertainty of the conclusion is never greater than the sum of the upper (lower) uncertainties of the premisses.

(Compare Edgington 1992.)

### III

In the first section in particular I have identified validity and preservation of truth. Although I am happy to accept everything Field (2009) has to say in his Part II regarding the mismatch of validity and truth-preservation where semantic discourse and the threat of paradox intrude, I think I need feel no embarrassment for having done so. Most of our assertions concern mundane matters, truth for them is grounded in worldly matters, and semantic paradoxes are distant. We are dealing with cases that fall within the realm where validity and truth preservation go hand in hand: the cases *when it matters*, as Field puts it. Of course, as he indicates, giving precise content to 'when it matters' is no easy task. Field gestures in a direction that raises no special problems for the account of norms gov-

erning assertion and belief presented here: a rule *preserves truth when it matters* if it preserves truth ‘when applied to premisses that can be established or are rationally believable’ (Field 2009, p. 266).

One point, drawing on the conventional nature of assertion, may be worth making. I said above that, in line with Putnam’s division of linguistic labour, the ultimate communal determination as to what count as logical consequences may owe some to the theoretical activity of those who theorize logical consequence. In the case of what rules govern a truth-predicate, those who theorize logical consequence are not agreed. It is easy enough for the straightforward cases. As Tarski taught us, ‘Snow is white’ is true (as a sentence of English) if, and only if, snow is white. But with truth explicitly or implicitly self-applied, there is not consensus; there is a breakdown in the guidance offered by the experts to the community of language users. While it is still correct to say that one is committed to the logical consequences of one’s assertions and one’s evidence, if the truth-predicate is counted among the logical features of one’s language, there may be no agreed standards of correctness determining all those commitments. Public rule- or convention-governed practices do not need rules to cover every possibility, nor even conventions on the setting of precedents. And semantic paradox does not stalk the land laying waste our every discourse.

Where a problem may threaten is in the normative role ascribed to logic in the light of assertion’s aiming at truth. If validity and truth-preservation come apart, valid inferences, it may seem, do not constrain the commitments taken on in assertion: validity is not obviously the right standard. Here, I think, the appearance of a problem is in fact illusory. In saying that assertion aims at truth, I do not believe that more has to be read into this than that for every proposition  $p$ , there is the norm: assert that  $p$  only if  $p$ . Arguably, as Julian Dodd (1999) has claimed, this makes it misleading—but convenient—to speak of truth as a norm of assertion. We can still tell much the same story about challenges to assertions being made through challenges to consequences. What we lose is any explanatory purchase we may have gained through talk of truth. It now simply becomes a feature of assertion and/or inference that assertions can be contested that way.

At first sight, the situation is more problematic if, as Dorit Baron and Keith Simmons have argued, assertion can be characterized only by appeal to the notion of truth. As they have it, assertion is

presenting as true (Bar-On and Simmons 2007). But it seems to me that this ‘presenting as true’ is no more than a shorthand re-description of what has just been said about assertion and logical consequence. A speaker just is presenting as true when she treats entailments of commitments as commitments and keeps her cumulative commitments consistent. In other words, to present as true is nothing other than to comply with Dudman’s fundamental dialectical requirement.<sup>15</sup>

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<sup>15</sup> I thank Georgi Gardiner for drawing some of the literature referenced in §1 to my attention and for discussion of some of the material in §§1 and 11.

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