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Is there Value in Inconsistency?

Nomos

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A Reply to Christoph Engel's Comment

There are a number of claims in the Engel commentary, only some of which we shall attempt to engage here. But his 'bottom line' is clear enough: he believes that the attempt to draw analogies between collective epistemic and collective preference problems is essentially wrong-headed – that there is really no connection between the epistemic and the preference setting, or at least not enough connection to be interesting. Since our approach depends on the claim that these two issues *are* related, and that pointing up the relation between them is illuminating, Engel's position is obviously one that we contest.

Here we want to investigate three issues that are both canvassed in our main presentation but perhaps too briefly. Our discussion of each of these issues takes as its point of departure a direct quotation from Engel's critique. The first deals with the relation between the epistemic and the preference version of the 'majoritarian' problem; the others deal with the nature of the problem in the epistemic case. We deal with these, in turn, in the ensuing sections.

I

> *"… in order to generate a cognitive version of Arrow's theorem, Baurmann and Brennan must instil ordinality into a set of cognitive problems."*

Engel's idea here seems to be that, since Arrow's theorem relates to the aggregation of *rankings,* that some analogous ranking of propositions must be introduced if Arrow's approach is to have any connection to the 'cognitive' case.

There are two levels at which we want to respond to this idea. At the first level, we want to insist that our approach does not require that the Arrow theorem be directly applicable to the epistemic case, as if there were an isomorphism between the 'preference' and 'cognitive' settings. All that is necessary is that there be a reasonably close family resemblance between majoritarian *preference reversals* and instances of majoritarian logical incoherence. The resemblance here may simply consist in the following four similarities:

- individual preferences/beliefs are given and obey certain standard properties (transitivity in the preference case, logical coherence in the belief case);

- the quest for an aggregate version of those preferences/beliefs is an object of interest;

- a set of plausible meta-level norms for aggregation is provided;

- no aggregation rule satisfying these norms can be found for all possible compositions of preferences/beliefs.

The question as to whether the epistemic version of the problem is *the real* Arrow problem is a secondary issue. To be sure, it is necessary that majoritarian inconsistency *be* a problem of some kind in at least some cases. And it is necessary that the basic logic of the Arrow problem and the majoritarian inconsistency problem be sufficiently alike that there is some interest in examining the problems side by side. Beyond that, we do

not need to go. In fact, it is important to us that the preference version and the epistemic versions be sufficiently different that they call for different weightings of somewhat analogous meta-level norms.

That said, we think that Engel under-estimates the extent to which majoritarian inconsistency and majoritarian incoherence are alike. He seems to be led to this because he thinks of propositions as 'social states'. On this basis, he sees a ranking of propositions to be required to get any Arrow analogy fully off the ground. But a proposition is better thought of as a pair-wise comparison. Just as transitivity requires a relation between pair-wise comparisons for individuals, so logical entailment requires a relation between propositions. The question is whether, under various aggregation procedures obeying certain other apparently desirable properties, the transitivity/consistency that applies at the individual level transfers to the aggregate level. The answer is in general no – and for reasons that seem to us strikingly similar.

II

"If only unconditioned statements were accepted at the social level, the paradox would go away."

It is true that the propositions that figure in our examples are not strictly independent. In the medical example, say, it would be incoherent for a doctor to believe that it would be appropriate for you to have the operation, when she does not believe that you have the disease. Equally, in the judicial example, it may seem strange to think of a judge saying, of a contract that he doesn't believe exists, that it is entirely conscionable. Of course, we agree. But we think this kind of observation misses the critical point. The doctor who believes that patient A does not have the disease certainly does not think that A should have the surgery. But this fact does not prevent the doctor from totally coherently believing that patients who *do* have the disease ought to be operated on immediately. In the same way, a judge can believe that the requirements that need to be met for a contract to exist are not met in a particular case, and also believe that, if they had been met, unconscionability would not be an issue.

In any event, it is easy to see that Engel's claim is false on its face. Let p and q be logically independent propositions *by stipulation*. Suppose the pattern of belief among three individuals is that 1 believes p and q; 2 believes p and not q; 3 believes q and not p. Since p and q are logically independent, this pattern of beliefs cannot be ruled out on logical grounds.

Now consider the 'majority beliefs' that derive from this structure. A majority believes p. And a majority believes q. But a majority does not believe the proposition (p and q). This means that majority rule can give rise to logical incoherence – because it is a requirement of logical coherence that belief in p and belief in q implies belief in (p and q).

In part, Engel's false claim, arising as it does from a mis-interpretation of the examples, may be our fault. Perhaps those examples are not explicated in sufficient detail to capture the central points. A fuller explication of the medical example is provided below with this possibility in mind. That said, however, it is of course absolutely central to the whole exercise that the 'bottom-line' proposition in each case is *not* logically independent of the 'reasons' that justify it. The whole point is that final decisions (bottom-line propositions) are based on reasons (logically prior propositions) in each individual case – but not necessarily for the majority!

Of course, there is nothing deeply puzzling in this fact. We cannot expect that logical coherence in beliefs – which is a property of individuals – will transfer to majorities if the particular individuals who compose the majority in each case are different. And of course it is precisely this difference in majority composition that drives the 'inconsistency'. The majority that believes p is constituted by individuals 1 and 2. The majority that believes q is constituted by individuals 1 and 3. The majority that believes (not [p and q]) is constituted by 2 and 3.

But this is just to repeat what we argue in the paper. The incoherence uncovered does not depend on statements being conditional, as Engel claims. It depends on the simple fact that majorities can change composition.

We should finally emphasise that it would be totally unreasonable to exclude conditional statements from belief formation. The epistemic substance of the proposition: "if X has disease V, she should have surgical procedure J" does not depend on whether X has the disease!

It is perhaps belabouring the point, but it might be useful to go back to the medical example and retell it in the following (simplified) way. The simplification is just that we will reduce the propositions to two. We retain the three doctors, so that the idea of a 'majority view' is meaningful. Here is how the story might unfold.

> You are not feeling well. You take yourself to your doctor. He conducts some tests and you report back a week later to hear the results.
>
> "I have bad news for you, I'm afraid", he tells you. "You have a malignant tumour in your prostate. You should have surgery immediately."
>
> You gulp. This is a shock. Perhaps, you think, you should get a second opinion, just to be on the safe side. So you go to a second doctor – recommended to you by a friend. You tell the second doctor everything. She says to you: "Certainly, if you have a malignant tumour, you should have immediate surgery: that advice is good. But let me conduct some tests of my own. You can come back in three days time and I'll let you know what the tests show."
>
> Three days later you report back. The news is wonderful. She has conducted the tests and they are totally clear. You don't have a malignant tumour at all.

But you ponder. You have had quite different verdicts from two different doctors. You'd like to believe the second, but ... Perhaps you should get a third opinion.

Two days later you find yourself in a third doctor's office. You explain your predicament. "Well" says Doctor Three, "I'll do some tests and give you a judgement next week." And duly next week, the doctor delivers his verdict.

"There is" he says "good news and bad news. The bad news is that you definitely have a tumour and it is indeed malignant."

You are devastated. But there was, wasn't there, a glimmer of hope? Plaintively, you enquire: "You said there was good news?" "Yes, I think so" Doctor Three replies. "The situation is that lots of men of your age have prostate cancer and yours is not yet greatly advanced. This is a form of cancer that develops quite slowly. In fact, most of the 50% of men who have the disease at your age actually die of something else. If I were you, I would not have surgery. I shall give you some pain-killers to take whenever the pain gets troublesome. But I think that this is not really anything to worry about. I do not recommend surgery in cases like yours."

What are you to do? The doctors seem disagreed on just about everything. But they all have good reputations and all speak with total confidence. "I guess I'll just go with the majority", you say to yourself. Doctors 1 and 3 think you have a malignant tumour. So you accept that. Doctors 1 and 2 think that people who have a malignant tumour should have immediate surgery. So, majority opinion plus simple logic, requires that you have the operation immediately.

But wait a minute. A majority of the doctors think you *shouldn't* have the surgery: doctor 2 because you don't have the disease; doctor 3 because surgery is not called for. "Going with the majority" doesn't really provide a decisive answer as to what you ought to do.

Engel seems to make two claims in the face of this predicament. First, he seems to think that the judgement of the second doctor on the question of whether surgery is the required treatment *for those people who have a malignant tumour* is irrelevant. He thinks this because this doctor doesn't think you have a malignant tumour. But we think Engel is wrong about this. One can perfectly coherently believe both that surgery is appropriate for the relevant class of patients (those who have a tumour) and yet believe that a particular patient (you) is not in that class. Doctor Two doesn't believe *you* should have surgery. But that belief does not disqualify her expertise on the general question of appropriate treatment in cases where the disease is present. And expert opinion on that question is something that you want.

Second, Engel seems to think that the *overall majority* judgement on what you ought to do is irrelevant. You should, he thinks, just look at the judgements on the premises. Perhaps this is so. It is certainly true that the panel of doctors is not required to come to a joint decision – whether by majority rule or any other procedure. Still, to the extent that the majority view *as such* carries epistemic weight for the patient, the fact that the 'majority view' is internally inconsistent seems to be a real problem. One certainly can't prevent you as patient from reflecting on what the overall advice on the best course of action is. And the claim that this overall advice should not carry any weight with you requires additional argument that Engel does not supply.

III

Engel asserts that what is at stake in our cases of majoritarian incoherence is an (inappropriate) application of Arrow's theorem to the problem of "*decision-making under uncertainty*". The problem with this characterisation of our enterprise is not so much that it is false as that it is unhelpful. It is so because what is at stake is not so much decision-making under *uncertainty* as decision-making in the face of *disagreement*. Engel may assert that these amount to the same thing – so it is worth emphasising that uncertainty can arise for the isolated individual. Crusoe on his island can be uncertain about tomorrow's weather without any inter-personal disagreement whatsoever. And equally, individuals may disagree without any of them being subjectively 'uncertain'. Engel may assert that objective certainty is not consistent with the fact of disagreement – that individuals can't *really* be certain when others disagree with them. But 'certainty' in the context we are dealing with is a matter of individual beliefs – of their psychological states – not of what it is that may be "objectively justified". The phenomena that are of interest to us in our paper are created by particular *patterns of belief*. To describe the problem those patterns pose as a matter of decision-making under uncertainty just does not seem to capture what is at stake.

Now, Engel is perfectly right to claim that a decision as to what to do in cases like this is not independent of the costs and benefits of the alternative courses of action – of the size of the upside and the down-side risks. If the operation is inexpensive and relatively simple, and involves only minor inconvenience, you might be well-advised to have it even if the likelihood that you have a malignant tumour is small. And it is true that our medical example does not focus on this aspect. But determining the size of the relevant costs is also a matter on which you will probably want expert opinion; and then the problems we have referred to can be predicted to arise in this other domain.

There could be several reasons why one might think that it shouldn't. One might argue, for example, on the basis of what we term the mandate theory of 'truth', that the probability that a proposition is true is equal to the proportion of the expert body who believe it. On this basis, the proposition: you have the disease; and the proposition: surgery is required for victims; each has a probability of 2/3rds of being correct. So both together have a probability of 4/9ths of being correct – less than an even money bet. On

this interpretation, the precise distribution of negative views across the set of doctors is irrelevant. Suppose for example that one of the doctors (Doctor Two, say) believes *both* that you don't have the disease and that surgery is inappropriate even if you did. Suppose the other two believe that you have the disease and should have surgery. Despite the majority judgement in favour of proceeding (1 and 3), the measured probability of both propositions being correct would remain 4/9ths. The weight of evidence would not justify the belief that it is right to proceed.

Perhaps this is the line of reasoning that Engel has in mind. Or perhaps he thinks that the fact that the doctors do not have any institutional existence as a panel (unlike in the example of the bench of judges) means that the majority view on the final action is irrelevant. We do not think that conclusion follows and have framed our discussion of the example here to suggest why. In each visit to the doctor, you want advice as to whether you should have the operation or not. Two of the doctors tell you that you shouldn't, though each grounds that view on quite different reasons. It is the divergence between reasons that creates the ambiguity in your mind. If a majority of doctors had said that you should proceed, would you have been inclined to buck that majority view? Perhaps you would not, even though the mandate theory of truth suggests you should.

All of this serves perhaps simply to belabour points that were made more succinctly (and maybe more clearly) in the original version. We remain convinced that there is a close family resemblance between the issue of majoritarian incoherence and the issue of majoritarian preference reversals. We think that the same issue – differences in the composition of the majority in favour of different propositions – drives the central results in each case. But we think that different methods of resolving the difficulty – if it is to be resolved at all – commend themselves in different settings.

As far as we can tell, Engel does not dispute this last claim. His critique lies at an earlier point in the argument. He thinks majoritarian preference and majoritarian belief are driven by different logics, and that juxtaposing the Arrow theorem with the majoritarian incoherence problem is misleading. We think by contrast that the logic involved is essentially the same, that understanding is advanced by juxtaposing the two cases, and that the differences between the various cases lies in differential weight to be given to the various meta-level norms in different cases. Engel's discussion has not persuaded us to alter our views.