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Linda Zagzebski has recently argued that there is a conflict between a common view of the asymmetry of time and various other metaphysical hypotheses. She identifies conflicts in the case of the modal arrow of time and in the case of the causal arrow of time. In the case of the modal arrow I argue that on one view there is no conflict and that on another the principle should be abandoned that there are entailments between propositions about the past and the future. In the case of the causal arrow I argue that the conflict can be avoided by the adoption of a suitable closure principle.

Linda Zagzebski has recently argued[1] that there is a conflict between a common view of the asymmetry of time and various other metaphysical hypotheses. In particular there is a conflict between temporal asymmetry, the principle that the relevant type of temporal asymmetric modality is closed under entailment, and the possibility that there are entailments between propositions about the past and the future. She identifies conflicts in the case of the modal arrow of time and in the case of the causal arrow of time. There are a number of views one might have about the modal arrow; but I shall argue that on one view there is no conflict, and that on another the principle should be abandoned that there are entailments between propositions about the past and the future. I shall then go on to argue that in, the case of the causal arrow, the conflict can be avoided by the adoption of a suitable closure principle.

I. The modal arrow of time

The view about the modal arrow which Zagzebski considers has the following characteristics:

There is a principle of the necessity of the past:

Principle of the Necessity of the Past
If B is a proposition about the past[2] and B is true, then nec_t B.

As expected pos_t B if and only if not nec_t not B.

There is the normal principle for the transfer of necessity:

Transfer of Necessity Principle (TNP)
$Nec_t\ p, Nec\ (p \varnothing q) > Nec_t\ q$

And the equivalent principle for the transfer of possibility:

Transfer of Possibility Principle (TPP)
$Pos_t\ p, Nec\ (p \varnothing q) > Pos_t\ q$

She rightly points out that if we take the future, in contrast to the past, to be contingent in the sense that no proposition about the future is either necessary or impossible, and we also suppose that at least one proposition about the past entails at least one proposition about the future, we have a problem. For suppose that proposition p is about the past. It follows from the principle of the necessity of the past that it is necessary; and, if we suppose that it entails a proposition q about the future, it follows, given TNP, that q is necessary. But this conflicts with the principle that the future is contingent. Equally, if we suppose that the future is contingent and that there is at least one proposition p about the future such that it entails a proposition q about the past and such that its negation, not p, entails not q, then TPP implies that both q and not q must be possible. But this conflicts with the principle of the necessity of the past.

How might one respond to these problems?

Well, one natural response might be to reject the view that the future is contingent in the sense that *no* proposition about the future is either necessary or impossible. Zagzebski indeed notes that the intuition of the necessity of the past may be stronger than the intuition of the contingency of the future, and comments[3],

> That is possible, but then it is important to see that the rejection of either side of the asymmetry threatens the other and suggests that the idea of modal temporal asymmetry is confused. If the kind of necessity possessed by the past is possessed by the future, or even if it is possible that it is possessed by the future, the necessity of the past cannot be something it has simply in virtue of its pastness.

But this is surely wrong. If the necessity which characterises the past can also apply to the future, it follows indeed that this necessity cannot be unique to the past. But it does not follow that it does not apply to the past simply in virtue of its pastness. Pastness may by sufficient for the necessity at issue, without being necessary. We would, of course, have a modality which was not *purely* temporal; but it would be in part temporal.

Such an account of necessity is to be found in Aristotle.[4] His view seems to be that true propositions about the past are necessary; so are universal truths involving universals (which will include laws of nature); so are propositions entailed by these. He also thought that there were propositions about the future that are not necessary: it is neither necessary that there will be a sea battle tomorrow nor necessary that the

will not be. So Aristotle was able to accept both the principle of the necessity of the past (though without the subscript, since the necessity involved is not exclusively temporal), an asymmetry between past and future, and TNP and TPP (again, without the subscripts). There would also be nothing to stop him accepting that propositions about the past can entail propositions about the future and vice versa. It is true that it would follow from his view about necessity that, if universal determinism were true, all propositions about the future would be necessary or impossible. But there would still be an asymmetry between the past and the future in that true propositions about the past would owe their necessity to their pastness, whereas true propositions about the future would not owe their necessity to their futurity.

This Aristotelian view, as I have said, does not subscribe to an asymmetry which is as strong as that envisaged by Zagzebski in her discussion of the modal arrow of time. But there is at least one view worth mentioning which does, a view which associates the past with reality and the future with lack of reality.[5] On a strong version of this view, not only would the proposition that there will be a sea battle tomorrow lack a truth value, so would the proposition that the sun will rise tomorrow.[6] Though perhaps it might be allowed that it was true that the sun will rise tomorrow or the sun will not rise tomorrow, and perhaps this might count as a proposition about the future. So there will, at any rate, be no logically contingent truths about the future. In that case it is easy to see how the view would avoid the conflict pointed out by Zagzebski. It would avoid it by denying that a true proposition about the past could entail a contingently true proposition about the future, and by denying that a contingent truth about the future could entail anything. And this would, of course, not be a matter of adhering to a view about temporal asymmetry at the cost of rejecting an apparently unrelated metaphysical view. To deny these things is an immediate consequence of denying that there are any contingent truths about the future.

On such a view the principle of the necessity of the past would be acceptable as it stands, but TNP (and TPP) would presumably need revising, since as TNP stands any logical truth would possess temporal necessity. We could avoid this by substituting the following:

Transfer of Necessity Principle 2 (TNP2)
$Nec_t\ p$, Nec $(p \varnothing q)$ and q is not logically necessary > $Nec_t\ q$.

II. The causal arrow of time

Zagzebski suggests very plausibly that, in many people's minds, what underlies a belief in an asymmetry between past and future, is a belief that propositions about the past cannot now be caused to be true, whereas (some) propositions about the future can be caused to be true. So we seem to have an intuitively appealing asymmetry. She then considers what transfer principles might be adopted for causability. She considers first principles which parallel those for necessity and possibility :

Transfer of Causability Principle (TCP)
Causable p, Nec (p∅q), > Causable q

Transfer of Noncausability Principle (TNCP)
Not causable p, Nec (p∅q) > Not causable q.

She points out, however, that TCP will not do, since a necessary truth is entailed by any proposition; so it would be a consequence of TCP that q would be causable if q were a necessary truth. She also points out that TNCP will not do, since an impossible proposition entails every proposition. So, if any impossible proposition is not causable, it would be a consequence of TNCP that q would not be causable whatever q was. She suggests instead:

Transfer of Causability Principle 2 (TCP2)
Causable p, Nec (p∅q) & q is not logically necessary > Causable q

Transfer of Noncausability Principle 2 (TNCP2)
Not causable p, Nec (p∅q) & p is not logically impossible > Not causable q.

Now she points out that TCP2 leads to problems if we suppose that there are causable propositions about the future which entail propositions about the past which are not logically necessary. An example involving such an entailment might be generated, she suggests, by the plausibly necessary principle that nothing can come from nothing. In particular she exploits the following:

Necessarily[(Eve will exist in the future∅The causally necessary conditions for Eve's existence obtained in the past) & (Eve will not exist in the future∅the causally necessary conditions for Eve's non-existence obtained in the past)]

Then, if it is causable that Eve will exist in the future or causable that she won't, it follows that it is causable that the necessary conditions for her existing obtained in the past or it is causable that the necessary conditions for her non-existence obtained in the past. But neither of these can be the case, if the past is not causable. So we have a problem.

She is right. But, if we ask why the problem arises, it is easy to suggest a revision of TCP which will avoid the problem. The root of the problem is that, in order to cause p to be the case, it is not necessary to cause all the necessary conditions for p to be fulfilled. It is sufficient to cause the fulfilment of the necessary conditions that are not anyway going to be fulfilled. For instance I can cause my car to start. It is a necessary condition of my car's starting that it exists. But I do not have to be able to cause it to exist in order to cause it to start. By the same token Eve's existence may be causable now, without the past necessary conditions being causable now, *as long as those necessary conditions obtain anyway*. So it is clear how we should revise TCP.

Transfer of Causability Principle 3 (TCP3)
Causable p, Nec (p∅q) & q is not true > Causable q

Is this principle acceptable? It is, of course, closely related to one of the power entailment principles suggested by William Hasker.[7]

(PEP) If it is in S's power to bring it about that *P*, and "*P*" entails "*Q*" and "*Q*" is false, then it is in S's power to bring it about that *Q*.

Now Zagzebski proposes three arguments against this principle (and related power entailment principles) in her *The Dilemma of Freedom and Foreknowledge*.[8] As far as the second of these arguments goes, happily TCP3 escapes, even if PEP does not.

Zagzebski's argument[9] is that, if God can determine that certain contingent states of affairs are strictly equivalent, it is plausible that he can make "I do A" strictly equivalent to "God does B", by deciding from all eternity that he would do B when and only when I do A, and that this decision would obtain no matter what else was the case. If we also suppose that God is essentially omniscient, and that, although I do not do A, I have the power to bring it about that I do A, the following will all be true: I have the power to bring it about that I do A; nec (I do A ∅ God does B); it is false that God does B. But, she claims, it will not be true that I have the power to bring it about that God does B. So PEP is not true. Now it is certainly debatable whether, in the circumstances envisaged, I do not have the power to bring it about that God does B[10]. But the example is in any case not a counterexample to TCP3, since all that TCP3 requires is that, if it is causable that I do A, and B is false, it is causable that God does B. And this will be true, since it is causable by God.[11]

However the first of Zagzebski's arguments seems to cause trouble for both PEP and TCP3.[12] This argument depends crucially on the idea that God has the power to make some necessary truths necessary. In particular she suggests that he may have the power to make the following a necessary truth:

(11) If there is a Fall, God sends his Son to redeem the world.

Suppose he does. He will nonetheless, she suggests, have the power to make (11) false. But the falsity of (11) entails that God does not exist (because, presumably, the negation of a necessary truth entails any proposition). But, since God does not have the power to bring it about that God does not exist, it seems that we have a counterexample to PEP. But we also have a counterexample to TCP3 because of the following: that (11) is false is causable; nec ((11) is false ∅ God does not exist), because (11) is necessary; it is false that God does not exist (let us suppose); but it is not presumably causable that God does not exist.

One natural reaction to this argument would be to reject the idea that God has the power to make necessary truths necessary. But it is worth asking whether TCP3 could be plausibly revised if we do not reject the idea. And surely it could. The reason it will not do as it stands is that it does not

take account of the fact that the necessity of (p∅q) may be affected by the truth of p. It won't, of course, in a modal system where, if p is necessary, it is necessarily necessary. But, in the circumstances envisaged by the example, this is not so; for, although (11) is necessary, if God were to make (11) false, it would not then be necessary; so its falsity would no longer entail that God does not exist, since that entailment crucially depends on the impossibility of the falsity of (11). So we must build into a revised version of TCP3 the requirement that the truth of p would not undermine the necessity of (p∅q). One way to do this would be to replace "Nec (p∅q)" with "Nec nec (p∅q)". But that would be unnecessarily strong, since, for our purposes, it need not be that it is necessarily true that nec (p∅q), as long as its truth is not undermined by the truth of p. Here is a more conservative suggestion, which deals directly with the crucial problem:

Transfer of Causability Principle 4 (TCP4)
Causable p, Nec (p∅q) & if p, it would still be the case that nec (p∅q)) & q is not true > Causable q

So, the position with regard to the transfer of causability is, I suggest, this. If p cannot be causable if not p is necessary, then TCP3 is plausible. If, on the contrary, p can be causable in spite of the fact that not p is necessary, then TCP4 is plausible.

Is there also a plausible revision of TNCP? I doubt it. As it stands it is totally implausible. For suppose that p is true, and is a statement of a set of sufficient conditions in the past for q, and that q is about the future. Then, although p may be uncausable now, we shall expect q to be causable now, since we shall expect p to be set of sufficient conditions for some proposition r which is true of the present, and is capable of causing q. This will indeed always be the case if causal chains are continuous in time. Again, suppose that p is a statement about the past which is false. Then, the fact that its truth would have necessitated the truth of q, will hardly mean that q is not causable. Why should there not be other ways of causing q which do not rely on the truth of p? However, there is no reason why we should expect any revision of TNCP to be true. After all there is no interesting principle about what follows from the impossibly of p together with nec (p∅q). And there is no interesting principle about what follows from the non-necessity of p, together with nec (p∅q).

However, just as there is both a principle of the transference of possibility and an (equivalent) principle of the transference of necessity, so, if TCP3 is true, there will be an equivalent principle of what we may call "unpreventability". Let us say that p is unpreventable just if not p is not causable. Then the following will be equivalent to TCP3:

Transfer of Unpreventability Principle 3 (TUP3)
Unpreventable p, Nec (p∅q) & p is true > Unpreventable q.[13]

And TUP3 fortunately looks rather plausible.[14]

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NOTES

1. "Omniscience and the arrow of time", *Faith and Philosophy* 19.4 (October 2002), 503-19.

2. When a proposition is said to be about the past, this must mean that it is wholly about the past, since we would obviously not expect a conjunction of a proposition about the past and a proposition about the future to be necessary. When is it true of a proposition that it is wholly about the past? Zagzebski does not say, and I shall not either. But one should notice that it cannot be the case for the purposes of her paper that, if p is about the past and p entails q, then q is about the past. For this would be inconsistent with the idea that propositions about the past can entail propositions about the future - assuming, of course, that no proposition can be wholly about the past and wholly about the future. It seems likely that to give a plausible account of when a proposition is wholly about the past it is going to be necessary to distinguish between logical entailment and metaphysical entailment, as Zagzebski does not. (See 518, note 2.)

3. "Omniscience and the arrow of time", 503-4

4. *De Interpretatione*, ch 9.

5. As Zagzebski notes. "Omniscience and the arrow of time", 503

6. I should emphasise that I am describing a possible view, not defending it. There will, of course, be a problem about laws nature in so far as they relate conditions at one time to conditions at another.

7. *God, Time and Knowledge* (Ithaca: Cornell University Press, 1989), 112. He labels the principle "PEP5".

8. *The Dilemma of Freedom and Foreknowledge*, (Oxford: Oxford University Press, 1991), 110-5. I discuss her first two arguments, but not her third (114-5), since she has now withdrawn it ("Rejoinder to Hasker", *Faith and Philosophy* 10.2 (April 1993), 260).

9. *The Dilemma of Freedom and Foreknowledge*, 113-4.

10. My inclination is to agree with Hasker that I do have the power to bring it about that God does B. See his "Zagzebski on power entailment", *Faith and Philosophy* 10.2 (April 1993), 252-3.

11. No doubt Zagzebski's example is questionable, since it is questionable whether God can make "I do A" strictly equivalent to "God does B". But it seems that the plausibility of the example as a counterexample to PEP does not depend on this. It would be sufficient for the purposes of generating a counterexample that the truth of "God does A if and only if I do B" is something that I have no power over.

12. *The Dilemma of Freedom and Foreknowledge,* 110-3.

13. TCP3 is equivalent to Not causable q, Nec (p∅q) & q is not true > Not causable p, which is equivalent, by virtue of substituting "not p" for "q" and "not q" for "p" to Not causable not p, Nec (not q∅not p) & not p is not true > Not causable not q, which is equivalent to Unpreventable p, Nec (p∅q) & p is true > Unpreventable q.

14. But, of course, it would have to be revised to the equivalent of TCP4, if TCP3 is not acceptable in the light of Zagzebski's argument.