

## Are all metaphysically necessarily true theories unfalsifiable?

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It seems to me that there is no reason to think that all metaphysically necessarily true theories are unfalsifiable. Consider a metaphysically necessarily true theory T. Theory T can be understood as a conjunction of metaphysically necessarily true propositions (say, the conjunction of T's premises, T's inferences and T's conclusions). Being a conjunction of necessarily true propositions, theory T is true in each and every metaphysically possible world. There is no possible world in which T is false.

Does it follow that T is unfalsifiable? No. There is no reason to think that we cannot at least *conceive of* an observation O whose occurrence would be logically incompatible with theory T. And if we indeed can, it follows that T is *falsifiable*. For even though there is of course no metaphysically possible world in which O occurs (after all, T is necessarily true), T is falsifiable by virtue of the fact that we can *conceive of* an observation O that - if actualized - would falsify theory T. The fact that this observation cannot occur does not undermine that we can still *conceive of* it occurring. And it's by virtue of *this* that T is falsifiable.

Note that I am committed here to the claim that conceivability *does not entail* metaphysical possibility. For else us being able to conceive of O occurring would entail that there is a possible world in which O occurs and thus T would not be necessarily true. Indeed, conceivability is not a guarantee for possibility. I don't go further than holding that conceivability merely renders metaphysical possibility *more likely*.

So for all we know there might be necessarily true falsifiable theories. We cannot exclude the existence of such theories. And this is a good thing, since if no metaphysically necessarily true theory is falsifiable, no such theory is scientific on Popper's falsifiability account. On his famous account only metaphysically contingently true theories would be scientific. This is counterintuitive, to say the least. For why would we have to denounce a falsifiable theory as unscientific only because we find out that it is necessarily true? That's not rational. If it already was considered scientific on Popper's criterion of falsifiability, it should remain to be considered scientific if it turns out to be metaphysically necessarily true.

To illustrate I would have to appeal to a metaphysically necessarily true theory. This is problematic since it is difficult - to say the least - to pick out such a theory. Nevertheless, let's illustrate the above by simply assuming for the sake of argument that Einstein's theory of special relativity is necessarily true. I do not believe that this theory is necessarily true. In fact I believe it's only contingently true. But that's another matter. For illustration purposes I for now just *assume* it to be necessarily true. If it is, then it is true in all possible worlds. Would Einstein's theory in this case still be scientific on Popper's criterion? That is, would the theory still be falsifiable? Yes, it would. Conceive of a changing speed of light. We can clearly conceive of this, even though there is no metaphysical possible world in which the speed of light varies. We can even construe a measurable empirical description of a changing light speed, even though such a change is impossible. So we can still conceive of circumstances that falsify Einstein's theory, even though such a falsification is metaphysically impossible assuming that Einstein's theory is necessarily true. So on the assumption that Einstein's theory is necessary, it is still falsifiable and therefore scientific on Popper's account, although there is no possible world in which it is falsified. It is falsifiable, but cannot be falsified.

Now, are there in fact metaphysically necessarily true theories that are falsifiable? And if not, is there

some deeper yet unconcealed reason for this or is it simply a brute fact of reality? One might hold that it is trivially true that all metaphysically necessarily true theories are unfalsifiable by virtue of the fact that there are no such theories. But this cannot be right. For if there are no metaphysically necessarily true theories, the following theory would be necessarily true: "There are no metaphysically necessarily true theories". After all, suppose for *reductio ad absurdum* that there is a possible world W in which the proposition "There are no metaphysically necessarily true theories" is false. In that case there is a metaphysically necessarily true theory H in W. Theory H is true in all possible worlds and thus also in the actual world. But then it follows that H is metaphysically necessarily true in the actual world as well and we arrive at a logical contradiction. So there must be at least one metaphysically necessarily true theory.

One might think that this theory may be wholly uninteresting since it perhaps consist merely of analytical truths (such as logical tautologies and statements of the form "All bachelors are unmarried"). And if so, it is not falsifiable either. However, we can demonstrate that there must exist a non-analytic or synthetic metaphysically necessarily true theory. For if there are no synthetic metaphysically necessarily true theories, the following theory would in fact be synthetic and metaphysically necessarily true: "There are no synthetic metaphysically necessarily true theories". I'll show this in what follows. First, this theory is not analytic and thus synthetic since whether all metaphysically necessary truths are analytic cannot be settled by conceptual analysis alone. Whether it is so is a substantive matter that depends on the nature of reality. Second, in order to show that the theory is metaphysically necessarily true we suppose again for *reductio* that there is a metaphysically possible world V in which the proposition "There are no synthetic metaphysically necessarily true theories" is false. In that case there is a theory L in V that is synthetic and metaphysically necessarily true in V. But then theory L is synthetic and metaphysically necessarily true in the actual world as well and again we arrive at a contradiction. So there must be at least one synthetic metaphysically necessarily true theory in the actual world. And for all we know this theory may due to its synthetic nature be falsifiable in the way described above.