

1. Introduction

According to Hugh Everett III, when things could go one way or another, things go both ways. When I flip a coin, it lands both heads and tails. I do not normally find that flipped coins land both heads and tails; in fact, they seemingly always land exactly one way. What gives? Everett explains coin flips cause the world to branch in two. Before the flip, one coin, one flipper, and so on. After the flip, two coins, two flippers, and so on. The world travels two paths at once. Along one path, heads; along the other, tails. Neither path can observe the other, but both exist, nonetheless. Everett's claims about the extraordinary powers of coin flips are in service to a theory about quantum mechanics, the measurement problem, or what happens when a superposition collapses. Macrophenomena like coin flips, are composed of quantum particles in superposition. When observed, the superposition collapses into a single state but which and why? Everett explains that every state of superposition exists and that we merely become a part of one such state. Hence, every valid evolution of the wavefunction corresponds to one path of many taken by the world.

Quantum survivability is an intriguing consequence of Everett's theory. If Everett is right, then we – you and I and everyone else – will live forever. For any event that would take a life, that event induces the world to branch into so many futures, some of which support survival. Our total 'measure' or representation across branches decreases but, first-personally, we carry on. We can always rely on *some* quantum state to sustain us. Quantum survivability is not a certain consequence of the Everett interpretation, but it has its adherents – David Lewis among them.

According to David Lewis, when things could go one way or another, things go both ways. When I flip a coin, it lands both heads and tails. I do not normally find that flipped coins land both heads and tails; in fact, they seemingly always land exactly one way. What gives? Lewis explains the actual world is but one among a plurality of concrete but spatiotemporally isolated worlds, and that the truth about what is possible of the actual world depends on what is true in any world. Lewis' theory is called 'Modal Realism.' When I flip a coin in the actual world, it will land heads or tails. But, if it is genuinely true that the coin *could* have landed otherwise, then there exists some world where it does land otherwise. Well, Lewis claims it is not the same coin that lands otherwise, but its counterpart. Lewis rejects transworld identity. More accurately, when I flip a coin, it lands exactly one way and its counterpart lands the other way.

Both Everett and Lewis tell these remarkable stories about the plural existence of worlds in service to theory. Only one story is thought to imply our indestructibility. This is a mistake. In this paper, I argue Modal Realism implies our indestructibility. I term the thesis 'intermodal persistence' (IP). Its gist is that we can always rely on *some* world to sustain us just as we can always rely on some quantum state to sustain us.

Lewis rejects IP. He believes survival is a matter of both identity and psychological continuity, but he denies transworld identity and denies psychological continuity between worlds. We are worldbound individuals and worlds are causally isolated from one another. We are not identical to our counterparts nor do our surviving counterparts bear a causal relation to us. Hence, their survival is not our survival. I agree with Lewis that survival is a matter of

identity and psychological continuity, but I disagree that such conditions preclude IP. Transworld identity comes in varieties and psychological continuity is not intraworldly causal continuity. Although some transworld individuals are ruled out by counterpart theory, the kind needed for our survival across worlds is not. And although worlds are causally isolated, certain orderings of individual stages between worlds are yet psychologically continuous.

The paper is organized as follows. I present a basic argument for indestructibility. I present Lewis' objections to that argument. I defend against those objections.

2. *Intermodal Persistence*

Here I present a basic argument for IP. The first premise is that concrete modal realism itself is true, of course. Hence:

Concrete Modal Realism: Merely possible worlds and their inhabitants have the same ontological status as the actual world; merely possible worlds are concrete.

For present purposes, little else needs to be said about *Concrete Modal Realism*. The boundaries of worlds are carved along causal or spatiotemporal lines. We are familiar with the actual world. Every part of the actual world is related in some salient way – causally or spatiotemporally. Then, there are the other worlds. They are non-actual, but they are equally real. No part of any world is spatiotemporally or causally related to any part of another world.

Given non-actual concrete worlds exist, we next require enough worlds to furnish truthmakers for almost all our possibility claims – at least sufficiently many to ensure the survivability of any life-threatening circumstance. I contend if sufficiently many worlds exist to substantiate as many pre-theoretic modal opinions as are needed to make Modal Realism an adequate analysis of possibility, then there are enough worlds to entail the possibility of one's future survival in all circumstances. Hence:

Plenitude: Enough worlds exist to ground the truth of sufficiently many of our pre-theoretic modal opinions as needed for a Lewis-style analysis of possibility to be adequate.

Next, we simply require that survival is always possible.

Necessary Survival Chances: For any person stage p , a person stage p' possibly exists such that p and p' are distinct stages of the same person P , and p' is a future stage of P at p .¹

Necessary Survival Chances is a possibility claim, a modal opinion, and so combines with *Plenitude* to imply the existence of surviving counterparts of every person who actually dies. *Concrete Modal Realism* imbues those counterparts with reality, a concrete existence.

The last premise is the condition under which a person's survival is guaranteed.

¹ For p' to be a possible future stage of P at p , some set of intermediary stages between p and p' must be possible just in case p and p' would be distal stages.

Survival: For any person P with stage p, if a possible future stage p' of p exists, then P will persist until at least p'.

We have already inferred from the first three premises that such a future always exists for everyone. *Survival* tells us we survive insofar as a concrete pathway into the future exists. Hence, we conclude that we are all indestructible. *Survival* is the obvious suspect, and the rest of the paper is dedicated to its defense. Some may find *Survival* has intuitive appeal, but likely only because they do not also endorse Modal Realism. *Survival* is a much stronger claim when we think of our possible future being a world away.

3. *Survival Conditions*

But being a world away makes the difference for Lewis. Persistence is a matter of psychological continuity, which is itself a causal matter. *Ex hypothesi*, we are never causally related to otherworldly individuals and so are never psychologically continuous with them. A thought: if individuals between worlds were identical, then they persist if they are alive in at least one world. Alas, Lewis also rejects transworld identity. Hence, Lewis has a two-pronged objection to IP. Survival is both a matter of psychological continuity and identity, yet modal realism denies the existence of both causal relations between worlds and transworld individuals. Hence, *Survival* is false for the modal realist and *Concrete Modal Realism* is false for everyone else. Damned if you do...

I can come up with three kinds of responses. The first is to outright reject that any one person persists at all, that only momentary stages are persons and persistence is a relation between many distinct individuals. The idea tows the line between comforting and unnerving. Regardless, Lewis (and everyone else) takes the monadicity of survival to be an obvious desideratum. Another idea is to accept Lewis' view of persistence for the most part but append disjunctive conditions for persistence, a view which I call Next-Best-Thing-ism. Next-best-Thing-ism has the right spirit but is explanatorily deficit. Conceptually distal conditions for survival sound *ad hoc*. What IP needs is a palatable theory of survival that combines with modal realism in the right way.

The best kind response is to buy into Lewis' account of survival – identity and psychological continuity both matter – but argue his account yet implies our indestructibility – at least in conjunction with concrete modal realism. Lewis is right to complain about transworld identity's prospects as a ground for the truth of our modal opinions, but I counter that Lewis is wrong to deny the existence of transworld individuals outright. Likewise, Lewis is right that psychological continuity is necessary for survival, but wrong to believe psychological continuity cannot obtain across worlds (or that we cannot make sense of its necessity across worlds).

4. *Transworld Identity*

Relations come cheap. Identity relations come at a discount if any. Who is to say there cannot exist a being extended across worlds? Take a dumb donkey in this world and a talking donkey in another world, their fusion is a third thing. Why not? In the present context, any axiom

of counterpart theory that defines individuals as worldly inhabitants begs the question against transworld identity. Why should we think all individuals are worldbound? Is it because we only think of ourselves as inhabitants of one world? Well, that is because we have always thought that only one world exists. But Modal Realism says many exist. Once the question has been raised, we should consider it. Might we exist across more than one world? There is no sense in answering ‘no,’ all in the name of common sense. If the modal realist knows anything to be mortal, it is common sense, which has long since been laid to rest in his mind.

It could be said that counterpart theory’s chief virtue is to do away with transworld identity. Should the modal realist worry that his view is ineffectual without a ban on transworld identity? Leave off the postulate that all individuals are worldbound and run the risk of transworld individuals with unanalyzable modal properties. Or so we might worry. But the worry would be misplaced. Pretend we have irrefutable proof of the existence of many worlds that makes no mention of what is possible. Surely any genuine proponent of unrestricted mereology claims two or more individuals between worlds are always parts of another individual. There is no right to deny him on behalf of counterpart theory! But there is no need anyway. It is absurd to presume Modal Realism’s own reductive analysis of possibility would be in worse shape because the existence of many worlds was independently demonstrated beyond the faintest doubt.

A wholesale denial of transworld identity is not only unjustified, but it is also simply uncalled for. Making sense of the modal properties of transworld individuals is trivial. Suppose Frank is the fusion of two cats between two worlds. Frank supervenes on the cats who compose him. What is possibly true of Frank is a matter of what is possibly true of what composes him and the context of our utterances about Frank. Frank *qua* composed of at least one black cat and one white cat who are not world mates has a counterpart in every interworldly pairing of one black cat and one white cat. At least, I see no issue with this analysis.

No, the source of Lewis’ prejudice against transworld individuals is the role they play in competing analyses of possibility. Proponents of transworld identity tend to think that you *are* your counterparts and that you genuinely have different properties in different worlds. Well, I agree with Lewis that I am not my counterparts and that I do not have all their properties. We can have transworld identity while rejecting that transworld individuals undermine counterpart theory. For a start, counterpart theory accommodates the flexibility of our modal opinions whereas transworld identity cannot. Of course, for any counterpart relation, there exists the individual composed of that set of counterparts, but so what? What are we to make of such an otherwise gerrymandered entity? Nothing I say.

Modal realists should permit transworld individuals into their ontology. Should they also believe themselves to be such individuals? Our initial impression is that we are worldbound, but our initial impression was that only one world exists *a fortiori* we must have been worldbound. None of us have ever observed persistence across worlds, but so far, we have only ever observed the actual. Is there any reason to doubt the plausibility of our own existence across worlds? Well, the worry about psychological continuity remains.

5. *Psychological Continuity*

Even if the Lewisian is convinced there exist innocuous kinds of transworld individuals, he will still deny that I have shown an individual may persist between worlds. Persistence is also a matter of psychological continuity, a causal relation between an individual's temporal parts. Mere interworldly fusions fail to instantiate the appropriate causal relation between their parts because worlds are causally isolatory.

I partly agree. Survival is a kind of causal relation, but it concerns psychological causation and not worldly causation. What is causality's role in our existence? Does it matter to our survival whether *this* photon excites *that* atom? Does it matter whether photons excite atoms at all? Whether Everett was right? Whether there exist unmoved movers? In fairness, we cannot be certain until the mysteries of the mind have unraveled. But we tend not to think our lives depend on every detail *all the way down* about what causes what else. Psychological continuity occurs at a higher level of abstraction, which is a fact that supplies IP with one crucial resource for taking on psychological continuity. Alas, there is another.

There are many sober among us who do not believe cryogenic freezing could ever work in the way some others hope it will, who would rather believe the enterprise was captained by hundreds of different men by the name of 'James Tiberius Kirk', most of whom perished on the first occasion they attempted to beam down to some strange, new world. May such levelheaded thinkers rest in peace. Those of us with a little hope in our hearts for unending adventure may get what we want.

The important implication of surviving cryogenic freezing or teletransportation is that survival requires only a loose psychological continuity. If I were frozen dead for one hundred years only to be resurrected in an even more dystopian future, I would have no actual, temporal parts over the interim duration. I would survive as gripping television broadcasts do despite apparently pardonable commercial interruption. We survive gaps, which is the next crucial resource IP requires.

What does gap survival and the fact that psychological continuity concerns higher level abstraction have to do with anything? I suggest that between them, we have no reason to believe psychological continuity cannot bear between worlds. It does not matter whether two psychological states are worldmates when asking whether they are continuous. Gaps between worlds are akin to gaps within worlds, and the fine-grained differences between worlds – their thumb prints – are too fine grained to matter to psychological continuity. In the same way that the successor to 3 is 4, regardless of where numbers are located, the psychological continuity of mental states is exclusively grounded in the intrinsic properties of those states and disregards their spatiotemporal or modal location.

6. Conclusion

Here is how intermodal persistence may play out: the last moment before your death is a stage. That stage has a duplicate counterpart, a person stage itself, in another world. Said counterpart is the psychological precursor to an entire succession of person stages; it is the beginning of the second chapter of someone's psychological story – yours! You are the fusion of these two individuals. There is no question about how to order your parts between worlds just

like there is no question about how to order the natural numbers successively. The properties of the parts do all the work for us to ensure the appropriate relations obtain. Hence, *Survival*, hence we are indestructible.

This story does not sit quite right with me, however. I am always psychologically continuous with infinitely many duplicate counterparts. What anchors me to the actual world during the time leading up to my death? Certainly, however we choose to answer this question explains why we die when our actual bodies no longer support us! What force shackles our souls to the actual during life will prevent us from being spirited away to alien worlds at death. Except that I deny there is any such force at work. I cannot imagine what it would be.

Instead, I suggest we are bilocated. We do not constantly phase into and out of the alien worlds inhabited by our duplicate counterparts because we *are* our duplicate counterparts – all of them – those worlds are all actual worlds to each of us. A second story: every individual across the space of possibility with your exact qualitative character, is you. So long as one such individual persists, you persist. Hence *Survival*, hence you are indestructible.

Bibliography

Everett III, Hugh. "'Relative State' Formulation of Quantum Mechanics." *Reviews of modern physics* 29.3 (1957): 454.

Haslanger, Sally. "Humean supervenience and enduring things." *Australasian Journal of Philosophy* 72.3 (1994): 339-359.

Lewis, David K. "Survival and Identity." (1976).

— *On the Plurality of Worlds*. Vol. 322. Oxford: Blackwell, 1986.

— "Ramseyan Humility." Department of Philosophy, University of Melbourne, 2001.

— "How many lives has Schrödinger's Cat?" *Australasian Journal of Philosophy* 82.1 (2004): 3-22.

Tegmark, Max. "The Interpretation of Quantum Mechanics: Many Worlds or Many Words?" *Fortschritte der Physik: Progress of Physics* 46.6-8 (1998): 855-862.