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# The MWI and Distributive Justice

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Special Issue

The Many-Worlds Interpretation of Quantum Mechanics

Edited by

Prof. Dr. Lev Vaidman



Article

# The MWI and Distributive Justice

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**Abstract:** Everettians generally argue that their view recommends just the same rational choices as orthodoxy. In this note, however, we will show that Everettians should advocate non-standard choices in one specific kind of situation, namely situations where different people have unequal claims to an indivisible good.

**Keywords:** many worlds; distributive justice; Everett; quantum mechanics; rational choice

## 1. Introduction

Defenders of the Everettian view typically hold that their strange metaphysical commitments make no difference to how we should live our lives. Everettians should proceed as normal when they make decisions. They should aim to maximise expected utility across all physically possible futures, weighted by those futures' probabilities, or intensities, or caring measures, or anyway squared wave function amplitudes. It does not matter what the quantities are called, argue Everettians, given that they have reason to attach the same numbers to envisaged futures as everybody else.

This might well hold true in general. In this note, however, we will show that Everettianism dictates unorthodox behaviour in one specific kind of situation, namely situations where different people have unequal claims to an indivisible good. In such situations, we shall argue, Everettian agents should act differently to non-Everettians.

In what follows, we shall assume the "fission programme" version of Everettianism [1]. In this version, which was originally adopted by Everett himself, and is endorsed by perhaps the majority of his followers, any quantum "collapse" is followed by the macroscopic objects involved, including any observers, "splitting" in a way that results in actual "branches" for all outcomes with a non-zero probability.

## 2. Normal Probabilities and Utilities

Before proceeding, let us put one issue to one side. Huw Price argued that a concern with fairness should lead Everettians to reject the Born rule that dictates the standard probabilities for outcomes in chancy quantum situations. If all the possible selves who experience such outcomes are equally real, argues Price, you should not favour the interests of the high-probability ones over the low-probability ones, but should treat them all equally. It would be unconscionable, argued Price, for an Everettian to deliberately engender a real successor who dies miserably in a plane crash, just to allow another successor to enjoy a few days on a sunny beach [2].

David Wallace responded that Price's underlying reaction might well be a rational response to Everettianism, but that it is no argument against Everettians respecting the Born rule. Much of Price's concern, said Wallace, can be met by reducing the positive utility attached to a few days' holiday, by comparison with the negative utility attached to an untimely death, and perhaps the Everettian realization that the death is sure to be real on some branch of reality should indeed encourage such a change of attitude. However, these utility adjustments can leave the Born probabilities as they are. Moreover, highlighted Wallace, no assignment of probabilities to chancy outcomes is going to ensure



**Citation:** Papineau, D.; Rowe, T. The MWI and Distributive Justice. *Quantum Rep.* **2023**, *5*, 224–227. <https://doi.org/10.3390/quantum5010014>

Academic Editor: Lev Vaidman

Received: 31 January 2023

Revised: 20 February 2023

Accepted: 23 February 2023

Published: 28 February 2023



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equal treatment of all successors, unless agents avoid all risky choices, and he goes on to present further arguments that no systematic deviations from the Born rule can be coherently sustained [3].

We think that Wallace is right about all this, but we need not assume this here. Our point is quite different from Price's. In the contexts we shall consider, all the probabilities and utilities at issue will be ones assumed both by orthodoxy and by Everettians. We shall show that, even so, in these cases, Everettian metaphysics advises different choices to orthodoxy.

### 3. Unequal Claims

Suppose Ann and Bill both suffer from a painful disease that lasts a year. Ann's suffering is worse. Let us say her degree of pain over a week is six, to Bill's four. (As will become clear, our general form of argument will not depend on the precise numbers).

Each week, just one dose of a drug that counters the disease is available. Ann can be rendered free of the pain for a week, or Bill can, but not both.

What is the best policy? One option (let us call it *All-Weeks-Ann*) would be to give Ann the drug every week. Clearly, that would maximise the cross-individual aggregate pain relief. After all, if Bill and not Ann were to receive the drug for any week, we would only alleviate four degrees of pain rather than six.

Still, nearly everybody will regard *All-Weeks-Ann* as less than ideal. It is unfair to Bill. He deserves some consideration too. He should have, at least, some weeks free of pain. So, some *Mixed-Weeks* option would seem better than *All-Weeks-Ann*. For example, we could give Ann the drug on just 60% of the weeks, and Bill on the other 40%. (Again, the precise number does not matter. Let us assume, for the sake of the argument, that the optimal mixed strategy is the 60-40 one).

There are issues in this situation about the commensurability of pain relief and fairness. However, let us not complicate things. Our points are most easily made if we assume some common utility scale for both.

As far as aggregate pain relief goes, *All-Weeks-Ann* outscores our assumed optimal *Mixed-Weeks* by 312 to 270.4 units of value over the 52 weeks of the year (*All-Ann* scores  $52 \times 6 = 312$  for pain relief over the year. As to *Mixed-Weeks*, on 60% of the 52 weeks, it delivers six units of pain relief, and on 40% it delivers four. In total, that is  $(0.6 \times 52 \times 6) + (0.4 \times 52 \times 4) = 270.4$ ).

However, we are assuming that *Mixed-Weeks* will outscore *All-Weeks-Ann* by more than that on fairness. To give it a number, let us suppose that the extra fairness of *Mixed-Weeks* adds 100 units of value. Then, all things considered, *Mixed-Weeks* outscores *All-Weeks-Ann* by 58.4 units of value.

### 4. An Indivisible Good

Now we turn to a variant case—a once-off one-week problem. The pain will only last one week for both Ann and Bill, and there is just one dose of the drug available for that week.

Clearly, the maximum pain relief will be delivered if we simply administering the drug straight to Ann—*This-Week-Ann*. That will deliver six units of pain relief, rather than the four that we would obtain by administering it to Bill.

Even so, some theorists think that *This-Week-Ann* would be unfair too. They say that, even in the once-off case, we should mimic the *Mixed-Weeks* strategy by holding a *lottery*. We should draw straws—the *Lottery-Mixing* option, let us call it—with the result that Ann has only a 60% chance of receiving the drug, and Bill has a 40% chance. That would be much fairer, they say, and this fairness would, as before, offset the prospect that we might fail to maximise the aggregate pain relief. (See, for example [4]).

In truth, however, the case for *Lottery-Mixing* over *This-Week-Ann* is highly unconvincing (at least as long as we assume orthodoxy over Everettian metaphysics). As far as pain relief goes, *Lottery-Mixing* lags behind *This-Week-Ann* by an expected 5.2 units to 6.

(There is a 40% chance that we will only alleviate Bill's four degrees of pain rather than Ann's six). What is supposed to compensate this pain-relieving inferiority to make us end up preferring *Lottery-Mixing*?

Well, we could say that, in addition to the issue of actual pain relief, on which *Lottery-Mixing* clearly lags behind, there is the point that *Lottery-Mixing* does definitely give Bill a 40% chance of pain relief. Additionally, you might think that this is where the extra fairness lies. At least Bill's chance of pain relief is proportional to his entitlement, and that is what makes *Lottery-Mixing* better than *This-Week-Ann* overall.

Still, what good are chances in themselves, when abstracted from their realizations? I make a bet that gives me a 90% chance of winning £100. However, the stupid horse fails to come home. Has anything good happened to me? Surely not. I wanted money, not a high chance of money. The chance without the money will not put food on the table. Chances, as such, butter no parsnips.

By the same coin, we should reject the idea that the chances being shared appropriately between Bill and Ann can compensate for *Lottery-Mixing*'s failure to maximize pain relief. It is not similar to the extended week-by-week *Mixed-Weeks* strategy. In that case, the overall loss of aggregate pain relief was balanced by the extra fairness Bill receiving some real pain relief alongside Ann.

However, in *Lottery-Mixing*, the supposed extra fairness dividend is bogus. Giving Bill a 40% chance of pain relief does not in itself add anything worthwhile to *Lottery-Mixing*'s negative impact on aggregate pain relief. As stated before, nobody cares about chances as such, but only actual outcomes. Additionally, *Lottery-Mixing* is clearly behind on that score. (Cf [5]).

(Do not be distracted by the attractiveness of a lottery in a once-off case where the entitlements are 50-50. In that situation a lottery will all least have the advantage of ensuring the drug is allocated impartially and not on some improper basis. However, this rationale falls away as soon as the pain symmetry is broken. There is nothing improperly partial about giving the drug straight to Ann because her need is greater).

## 5. Everettian Fairness

However, let us now bring in Everettian metaphysics. Now, the case for *Lottery-Mixing* looks quite different. Assume we have Ann and Bill in the once-off one-week situation of the preceding section. And now we hold a genuinely quantum lottery which gives Ann a 60% chance of the drug and Bill 40%. This will mean a future with two branches, on each of which both Ann and Bill have successors. On the first 60% branch, Ann's successor receives the drug and Bill's does not; on the other 40% branch, Bill's successor receives the drug and Ann's does not.

Now we have genuine fairness. We have managed to spread the actual pain relief over Ann's and Bill's successors, in proportion to their relative entitlements. *Lottery-Mixing* will still mean that the total amount of pain relief on weighted average across the branches is less than we would obtain from *This-Week-Ann* (5.2 to 6, as before). However, this loss of aggregate pain relief can now be compensated by some genuine extra fairness, just as it was for the *Mixed-Weeks* strategy in the year-long case (We originally offered this argument in favour of Everettian lotteries in Rowe and Papineau 2022 [6]).

Think of it in the following way. On orthodoxy, a lottery assigns the good proportionately over two *possible* futures (Ann wins, Bill wins). However, only one of these futures is actual, and that is the one where we want our actions to produce the best result. This means administering the drug to Ann, whatever any lottery says. If we end up administering the drug to Bill in the actual future because he won the lottery, we have simply done the wrong thing. Imagine then saying to Ann, in explanation of why we did not help her, "But don't forget the lottery fairly gave you a 60% chance of the drug". Ann will quite rightly respond, "What good are mere chances to anybody? Sure, there is a *possible* Ann who benefits from that chance. But why bring her into it? Morality is about real people, not possible people,

and you could have ensured the best for real people simply enough by giving the drug straight to me”.

On the Everettian view, by contrast, both the possible futures are actual. A lottery assigns the drug proportionately over actual worlds, not merely possible ones. Additionally, this should change our attitude. In effect, Everettianism renders the once-off drug divisible, after all. We can share it across the future, just as we did in the year-long case. True, we are not now administering it to Bill rather than Ann in different weeks of the year, but rather in different versions of this coming week. However, the upshot is the same. We have genuinely spread the pain relief across both Bill and Ann, and so, achieved the kind of fairness that can compensate for loss of aggregate pain relief.

## 6. Conclusions

It should be clear that the analysis we have given is of general significance. Everettian rational choices will diverge from orthodoxy across a wide range of situations. Our issue arises, in any case, where different people have unequal claims to an indivisible good. On orthodox metaphysics, there is a compelling argument that, in such cases, the good should simply be administered to the person with the greatest claim. However, Everettianism implies that, in such cases, allocating the goods by an appropriately weighted lottery will always be fairer.

We should note that it is not to be taken for granted that, in all such cases, the extra fairness delivered by an Everettian lottery will outweigh the diminution of aggregate benefit. In our examples, we assumed that this will be so. However, in real life, this will depend on the details of the unequal claims and of the lottery. Still, it is uncontroversial that extra fairness does sometimes compensate for a loss of aggregate benefit, as is shown by the way orthodox metaphysics regards the just distribution of divisible goods. Everettianism significantly expands the class of cases in which such compensation is available.

**Author Contributions:** Conceptualization and writing, D.P. and T.R. All authors have read and agreed to the published version of the manuscript.

**Funding:** There was no funding for this project.

**Data Availability Statement:** There were no data for this project.

**Conflicts of Interest:** The authors declare no conflict of interest.

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