Fine-Tuning the Multiverse Objection

Abstract

I seek to develop a clearer understanding of how a multiverse hypothesis affects the fine-tuning argument for theism. One of the key responses to the fine-tuning argument has been that there might be many universes. With many universes, the probability of getting a universe right for life may be quite high, in which case a design explanation is obviated. I examine the conditions that are needed for this objection to be successful. I review the current dialectic and suggest that confusion has arisen from the way a leg of the conversation has been developed—especially around the "this" universe rejoinder. I propose a way to get behind the confusion by thinking instead in terms of risk from the perspective of *each* universe. In the end, I hope to set the stage for a more productive investigation into what it would take to get a multiverse objection right for success.

Fine-Tuning the Multiverse Objection

To help us better understand the role of multiverses, I offer an analogy. Imagine you are invited to stay the night at Hilbert's Hotel. You are handed keys to room 76. As you enter your room, you look down the hall and see no end in sight. This hotel is just as legend describes it: infinite. Soon after you enter your room, you hear a knock on your door. A man in a black suit is standing outside. He invites you to play a lottery and then holds out a top hat.

"The rules are simple," he says. "There are a thousand tickets in this hat, labeled one through one thousand. Simply reach into the hat and draw out a ticket. If the number on the ticket happens to be "1000", then you will win a thousand dollars. If the ticket has the number 1 on it, you pay us $10. No other number has any consequent. Would you like to play?"

You agree to play. So, you draw out a ticket and have a look at its number. The ticket displays a big black number 1. You oI $10.

The man in black smiles slightly. He then asks, "Would you like to play again?" He explains, "Simply put the ticket you drew back into the hat, and I'll re-shake the tickets."

Will you play again?

Let us say you give the game another try. Unfortunately, once again you draw a "1" from the hat. Out of curiosity, you play *three* more times, and you draw a "1" each time, losing $10 each game. The game seems to be rigged against you. Is it?

Here is a reason to think the game is rigged. The probability that you lost the game seven consecutive times is 1/1000,000,000,000,000 *if* the game is fair. But if the game is rigged against you, then you can expect to lose every time. So using Bayesian reasoning, you conclude that your losses strongly *support* the hypothesis that the man in black is lying. Call this reasoning 'the rigged-game argument'.

But now suppose the man in black tries to assure you that the game is fair. He explains: "everyone in the hotel is invited to play the game each night. Although not everyone accepts the invitation to play, infinitely many do. He goes on to explain that by laws of probability, it's virtually certain that infinitely many people draw a "1" many times in a row every night. Therefore, you shouldn't be surprised by your losses." The man thus poses a multi-game objection to the rigged-game argument.

Does this multi-game objection defeat your reason for thinking the game is rigged? It would seem not. After all, it may be that *every* game is rigged. It's also possible that the man in front of you is lying about the reality of these infinitely many other games. What you do know is that *you* lost five times in a row. And you know that your losses are far more likely to have occurred if your game was rigged than if it wasn't rigged. The existence of games in *other* rooms makes no difference to your assessment about *your* game.

So far so good. But suppose now that the man in black invites you to peer outside your door. You look down the hall and see men in black lining every door as far as you can see. Your man in black then pulls from his pocket a silver device. He whispers into it, “Raise your hand if your person lost the game.” You look down the hall and see a speck of motion in the far distance. Beyond that, everything is a blur. Let us stipulate that in fact about 1 out of every 1000,000,000,000,000 games played resulted in a loss. And suppose the man in black convinces you of this fact. What should you think about your games now? Were they rigged?

I suggest that you would now have strong reason to think your games were *not* rigged. Here is why. You know that none of the other games are rigged. Furthermore, it is quite unlikely that out of the infinity of games, your games would be the only ones that are rigged. After all, the unusualness would be highly extreme—*one* out of *infinity* games. This high unusualness gives you a strong reason to think that your games are like the others: *not* rigged. The lesson here is that once you factor in the additional data about the other rooms and their distribution of losses, the most likely conclusion is that you lost your seven games by dumb luck.

I highlight two lessons so far. First, there can be different multi-game objections based upon different data. Recall that the first multi-game objection merely appealed to the hypothesis that there are other games. This second multi-game objection included knowledge of (or at least strong evidence for) the other games and the distribution of losses. I also saw that these different multi-game objections vary in their ability to defeat the rigged-game argument. In particular, while one objection defeats the argument, another objection fails to defeat the argument. The upshot is that not all multigame objections are equal.

I will now catalogue additional multigame objections in an effort to display further distinctions relevant to developing a successful *multiverse* objection. Our next scenario is designed to take into account a “selection-effect” that arises when assessing fine-tuning arguments. In particular, people in fine-tuned universe are unable to observe anything *but* a fine-tuned universe: if their universe were not fine-tuned for life, there would be no observers to observe the unfit universe. Consider, by contrast, that in the hotel scenario you are able to observe a game that is *not* rigged.

Let us alter the scenario, then, to take into account a selection-effect. Suppose now that you couldn’t have observed anything but a loss. Imagine, for example, that the man in black simply comes to your door and announces that you oI a $10 tax as a result of a lottery. He goes on to explain that 1 in 1,000 people pay this tax each night. Let us stipulate that in this scenario it is part of your background knowledge that you would not have heard about this tax had the man in black *not* come to your door; you hear about the tax only if you have to pay it. Imagine next that the man in black knocks on your door five nights in a row. Would these nighttime knocks provide you any reason to distrust his statements about the tax?

They would, and you can see why using Bayesean reasoning. The *prior* probability that the man in black is lying is not ridiculously low. Next, the probability that he knocks on your door is low—1/1000—per night *if* he isn’t lying. By contrast, if he is lying, then it’s unsurprising that you got these tax charges—and can expect to continue to get them. Using Bayesian reasoning, then, you conclude that the tax charges strongly supports the hypothesis that the man in black is lying. Call this reasoning 'the rigged-lottery argument'.

I assume (for the sake of argument, at least) that the above reasoning is unproblematic. For I assume (for the sake of argument, at least) that the selection effect doesn't *by itself* defeat the rigged-lottery argument or the fine-tuning argument. We're interested in the effect of bringing in many rooms/universes. I want to see whether there is a special selection-effect problem that arises from the postulation of many rooms/universes.

To help us test whether many universes poses a special selection-effect problem, let us now see what happens if I add to the above scenario a many-rooms objection. Suppose, for example, that in response to your suspicions, the man in black claims that the lottery happens for each room. He elaborates: "There are infinitely many rooms. Therefore, it is virtually certain that someone pays the tax seven nights in a row just by chance. Your situation may dismay you, but it shouldn't surprise you."

Has the rigged-lottery argument been defeated? Here is a reason to think not. As far as you know, *every* lottery is rigged. What you do know is that *you* were taxed five times in a row. And you know that these taxes are far more likely to have occurred if the man in black is lying to get your money than if your losses were the result of a fair lottery. The existence of *other* lotteries, though certainly possible, makes no difference to your assessment about your situation.

Let us expand this reasoning. There are two hypotheses on the table. The "chance" hypothesis is that your sequence of taxes was the result of a fair lottery. The "rigged" hypothesis is that those taxes were not the result of a fair lottery. To help us think about these respective hypothesis, let us imagine two corresponding versions of Hilbert's Hotel. In the "chance" version, the frequency of taxes per night is about 1 out of 1,000 people, and the frequency of getting taxed *five* nights in a row is about 1 out of 1 quadrillion. In the "rigged" version, by contrast, the frequency of taxes is plausibly much higher: plausibly, many if not all of the people are being taxed each night by a man in black. You know you are either in the "chance" hotel or in the "rigged" hotel. Which one is more likely given your sequence of losses?

I can answer the question in terms of risk calculation. Imagine that in both versions of the hotel, everyone *in your shoes*—i.e. those who gets taxed seven nights in a row—bets that they are in the rigged hotel. They each bet that their man in black is lying. In this scenario, everyone in the "chance" version gets their bet wrong. Even still, a higher density of bets come from people in the "rigged" hotel: for each person who bets wrongly in the "chance" hotel, there are a *quadrillion* who bet rightly in the "rigged" hotel. Assume—for ease of presentation—that the *prior* probability of being in the "rigged" hotel is equal to the prior probability of being in the "chance" hotel. Then the greater density of right bets translates into a higher *posterior* probability that you are in the "rigged" hotel. Therefore, if you bet on the "rigged" hotel, you are likely to be right. Your man in black is probably lying.

Note that you have no information about who else might be taxed. You don't know, for example, whether your neighbors were taxed. You are reasonably sure that there are other people in other rooms who are also losing money—whether all lotteries are rigged or fair. But that information doesn't tell you the *frequency* of loses down the infinite hall. If you did know the frequency, you would have information relevant to the rigged hypothesis. For example, if you knew that the frequency of loses is sufficiently low, then you'd have reason to think your losses were a matter of dumb luck. If, on the other hand, you knew the frequency of loses is high, then you'd have even more reason to think your losses were rigged. So frequency matters.

I have been assuming that it is antecedently implausible (improbable) that your room would be unique among the rooms. In particular, it is implausible that all other lotteries, *except yours* (or an infinitesimal percentage), are rigged. Call this assumption, 'Impartiality'. Impartiality lies behind two key inferences.

First, Impartiality allows you to infer that your losses are by dumb luck in the case where you know that the frequency of losses across the other rooms is low.

Second, Impartiality allows you to infer that your losses are rigged in the case where you *don't know* the frequency of losses across the other rooms. For Impartiality implies that for each room, *including yours*, it is far less likely that the occupant of that room finds out about seven consecutive taxes if that occupant is in the "chance" version of the hotel than if that occupant is in the "rigged" version. This second inference reveals that Impartiality can be used to give you information about the frequency of losses across the rooms. That's because in the case where you have reason to think that your lottery was rigged, Impartiality allows you to infer that there is a high frequency of rigged lotteries throughout the hotel.

Let us summarize our analysis. When faced with the many-rooms objection to the rigged-game argument, here are five questions to consider:

Q1. Are there many rooms?

Q2. Are there *enough* rooms to compete with the improbability of your losses?

Q3. Are the other rooms participating in the relevant lottery?

Q4. Is there a higher density of rigged lotteries in the "rigged" hotel than in the "chance" hotel?

Q5. Is the actual density of losses as low as would be expected in the "chance" hotel?

I recognize two distinct sequences of answers that would constitute a successful many-rooms objection. First, I could have a non-affirmative to Q4, while leaving the other questions open. To illustrate, suppose you have reason to think that the frequency of rigged lotteries across the rooms would be the *same* whether or not your lottery were rigged. In that case, your consecutive losses would be no less probable in the "rigged" many-room hotel than in the "chance" many-room hotel. Thus if men in black are indeed lining all the rooms, your losses don't give you a way to decide whether your lottery is rigged or not. To complete the objection, I add that the *prior* probability of affirmative answers to Q1-Q3 is not low. Without that addition, this many-rooms objection fails to launch.

Here is a second way to build the many-rooms objection. This time I will grant that there is a higher density of rigged lotteries in the "rigged" hotel. Now I need affirmative answers to the other four questions. As I saw before, the mere hypothesis that there are other men in black lining other rooms doesn't defeat your reason for thinking that *your* man in black is lying. On the contrary, given antecedent plausibility of Impartiality, you could actually extrapolate from your situation that *if* there were other men in black lining other rooms (though you have no idea if there are), they would probably be lying as well. The above reasoning implicitly assumes (or implies) an affirmative answer to Q4, since it assumes (or implies) that a higher frequency of the rooms would be rigged in the "rigged" hotel than would be expected by chance. To complete the objection, I add that the actual density of losses is as low as would be expected in the "chance" hotel. Again, without that knowledge, you may infer from your sequences of losses that you are probably in the "rigged" hotel—and that therefore the density of losses is probably higher than would be expected by chance.

I will now give a strategy for how one might attempt to develop a successful *multiverse* objection using a parallel analysis. Once again, we'll offer a sequence of questions:

> Q1. Are there many universes?
>
> Q2. Are there enough universes?
>
> Q3. Is there a relevant range of universes?
>
> Q4. Is there a higher density of fine-tuned universes given design than without design?
>
> Q5. Is the actual density of fined-tuned universes as low as would be expected without design?

I recognize two sequences of answers that would constitute a successful multiverse objection. First, someone might seek to justify a non-affirmative answer to Q4, while leaving the other questions open. Alternatively, someone might seek to justify affirmative answers to all the other questions.

I close this section by highlighting a significant result of our analysis. A successful multiverse objection requires more than defending the possibility, or even actuality, of many universes. Something must be said about the frequency of fine-tuned universes. One way to complete the multiverse objection is to try to show that there in fact are many universes *and* that the vast majority of them are lifeless. Alternatively, one might try to defeat reasons to accept an affirmative answer to Q4. But unless these further tasks are carried out, we are like the person in the hotel room who experiences an event that is far less likely given dumb luck than given design.