Comments on Jacob Ross, "Countable Additivity and the Sleeping Beauty Problem"

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1. One thing that I'm confused about in Jake's paper is why the conflict between Indifference and CA is a special problem for the Thirder. Of course, some people are just going to want to deny CA, and it seems to me that some of the cases that Jake discusses give them some motivation for doing so. Take the case he describes on p. 4 in which there is no coin flip; SB is just put to sleep and will definitely be woken up a countably infinite number of times (with her memory erased after each waking). I take it that there's a very strong intuitive pull here toward Indifference and thus away from CA; when SB wakes up, it seems crazy for her to be more confident that she has been awoken n times than m times, for any n and m. But that's true regardless of whether you're a Halfer or a Thirder. One lesson you might draw here is that everyone should deny CA in this sort of case (and, at least to me, the fact that everyone denies uncountable additivity makes this seem somewhat unsurprising). So what does Jake think that SB's credences should be when she wakes up in this case? Does he think it's plausible that she should have some countably additive probability distribution? Which one?

2. This might not be a big point, but I got confused on p. 7, in particular on footnote 6 ("Recall that if the infinite sequence hypothesis..."). Jake says that if the infinite sequence hypothesis is true, SB will lose the first bet. But I don't see that. If the infinite sequence hypothesis is true, it seems that she'll win the first bet, since the length of the coin sequence is greater than 1 (even though she only gets awoken once). I don't think that this affects Jake's argument.

3. I like the structure of the St. Petersburg betting scenario. But I'm worried that the argument proves too much. Again, take the case from p. 4 where SB is woken up a countably infinite number of times no matter what. When she wakes up, couldn't Jake's bookie do the same trick on her? And wouldn't that show that she has to obey CA in this case? Again, I just don't see why we should opt for CA over Indifference, nor can I imagine any reasonable countably additive credence distribution for her to have.

4. Related to 3, I'm worried that the argument doesn't essentially depend on being in a SB scenario. Suppose I show you a fair coin and offer you a bet which costs $1 and pays $4 if the coin lands heads and $0 if the coin lands tails. Obviously, you should take the bet, since your credence that the coin will lands heads is .5, and your credence that the coin will land tails is .5, so the expected value of the bet is (.5)($0)+(.5)($4)-$1=$1. So you take the bet. Suppose you win, and are thus up $3. Then, I offer you a bet with the same structure, but which costs $1 more than you've won so far: this time, the bet costs $4 and pays $16 if the coin lands heads, so the expected value is (.5)($0)+(.5)($16)-$4=$4, so you again (if you're decision-theoretically rational) take the bet. And suppose that I keep offering you the bet until you lose (the next one costs $16 and pays $64 if the coin lands heads), at which point you will have incurred a net loss. Surely, this doesn't show that it's irrational for you to assign a credence of .5 to the proposition that a fair coin will land heads. But then why does Jake's argument show something analogous about credences in SB scenarios?

   Of course, in my case, it's possible that the coin will never land tails and so you'll never lose, even though that has probability 0. So you're not strictly guaranteed to lose money after placing only finitely many bets. In Jake's St. Petersburg scenario, SB must have been awoken only finitely many times, so there is a guarantee that she'll lose after finitely many bets. But is this really enough of a difference between the two cases? In my scenario, the probability of your coming away a winner has a probability of 0, and you know that, but it's still decision-theoretically rational for you to take each bet and epistemically rational to assign .5-.5 credences to heads-tails each time. Again, I'm worried that the problem in Jake's case isn't really coming from any special commitment of the Thirder.

5. I think I agree with everything on pp. 8–15, but I guess my reaction is that a lot of it should be obvious even without going through the math. These guys are Thirders, and I think it's clear that Jake has correctly identified the generalized Thirder principle, so it's not particularly surprising that they're committed to that principle. Of course, it's still useful to go through the math to see how this commitment can be derived, but it doesn't seem to do any work in strengthening his case against Thirdism. If we need to give up the Generalized Thirder Principle, then of course Thirders are going to run into problems. So is that part of the paper just supposed to persuade people that Jake has in fact correctly identified the GTP as the principle that prominent Thirders are committed to? Or is it supposed to be doing some further work in arguing for CA and thus against the GTP? If it's supposed to do the latter, I'm not seeing it, so I'm interested in hearing whether Jake's only goal there is to argue for the claim that GTP is indeed a commitment of a few prominent Thirders.