Methodology

"The best test of a modeling technique is to see whether it can provide results for a variety of cases, and whether these results match our intuitions in cases whose solutions are obvious." (p.55-56)

"Most of these attempts [at solving the Sleeping Beauty problem] involve comparing Sleeping Beauty to another story that feels analogous, drawing out a particular solution's counter-intuitive implications for another case, or applying some unsupported position about relevance directly to the problem. The trouble with these one-off arguments is that they yield no *general* understanding and no *systematic* approach that will help us reach verdicts about other stories." (My italics, p.38-39)

So we want an account that is:

1. General: It applies to a wide variety of cases.
2. Unambiguous: It yields verdicts in a systematic fashion, without having to resort to loose arguments by analogy or vague intuitions about relevance.
3. Plausible: The verdicts it yields are plausible.

The Need for Super(duper)models:

Recap: You build a model by specifying the language, the times, and the extrasystematic constraints that can be expressed in the language.

Story: If my t_1 credences are $P_1(\cdot)$, and my evidence between t_1 and t_2 is $E_1 \wedge ... \wedge E_n$, what should my credence in A be at t_2, according to conditionalization?

If we model the story with a language in which the only atomic sentence is A, then we get:

$$P_2(A) = P_1(A|\Omega) = P_1(A) \tag{1}$$

Conditionalization tells us to update on whatever has a credence of 1 at t_2 according to the extrasystematic constraints, but there are no extrasystematic constraints involving E_1 through E_n in this model since these claims aren't in our language. So in this model we don't end up updating on anything.

Moral: If the model we use is too impoverished, then we won't get the right results about what our credences should be.

We'll always get the right answer if we work with a super(duper) model, God's model, where the language is maximally expressive and so all of the extrasystematic constraints can be provided.

But we can slack off and use an impoverished models to determine a verdict if we're confident it's the same as we'd get using God's model.

Motivating Mike's Proposal

Worry 1: We get worried about conditionalization when we consider context sensitive beliefs.

Response 1: **LC:** Roughly, only conditionalize if the model doesn't have any context-sensitive beliefs.

Worry 2: But if we work with God's model there will always be context-sensitive beliefs, so LC will never apply. God's model is the right model, so LC is useless.

Response 2: **CMP:** Roughly, a proposal for how we should be able to import verdicts from submodels to supermodels if they're related in the appropriate way.

With the LC+CMP package, we can get results with God's model.

Namely, we look at all of the appropriately related submodels of God's model, apply LC to these submodels, and then use CMP to import these verdicts into God's model.

Two things I'd like to see

1. In the original Sleeping Beauty case there are 2 relevant times:

t_0: Sunday night

t_1: Monday morning

If we model this case with a language only containing the atomic sentences H and T, the LC entails that:

$$P_1(H) = P_0(H|\Omega) = P_0(H) = \frac{1}{2} \tag{2}$$

Mike doesn't endorse this, and with good reason. This model is too impoverished. It leaves out crucial things like the fact that you learn that it's either Monday or Tuesday when you wake up.

Now, we can add claims like "it's Monday now" to the language to make the model less impoverished. But if we add the desired claims to the model, it will have context sensitive claims, and LC won't apply.

Mike suggests that (i) if we change the story and add a second time, t_2, where you learn what day it is, then we can get interesting results, and (ii) regarding our credence in heads at t_0 and t_1 this tweaked story is intuitively similar to the original story, so we should feel justified in applying the verdicts we get in the tweaked story to the original story.

But it would be interesting to see is if there's a way to extend the LC+CMP package so that it applies directly to cases like the original Sleeping Beauty case.

Two ways of understanding Mike's account:

The import of this extension depends on how we understand Mike's account.

(A) Your credences should be constrained in accordance with LC+CMP.

(B) Your credences should be constrained in accordance with LC+CMP, and your credences in intuitively similar cases should be similarly constrained.

Given (A), we don't get a verdict in the original Sleeping Beauty case. Since this is a paradigmatic instance of context sensitive beliefs, it would be nice to have the account deliver a verdict in this case.

(In terms of the methodology sketched earlier: It would be nice to have the account be appropriately *General*.)

Given (B), we get a verdict in the original Sleeping Beauty case, but we need to make use of intuitions about cases being relevantly similar to get them. But it would be nice to get a verdict in this case without having to resort to loose arguments by analogy or vague intuitions about relevance.

(In terms of the methodology sketched earlier: It would be nice to have the account be *Unambiguous*.)

2. A similar issue arises with the tweaked story.

For the tweaked story, Mike constructs three models, $S1$, $S0$ and $S0^-$ (a submodel of $S0$), and derives the following verdicts:

$$\begin{array}{lcl} S0^- & \rightarrow & P_0^{S0^-}(H) = P_2^{S0^-}(H) \\ \downarrow & & \downarrow \\ S0 & & P_0^{S0}(H) = P_2^{S0}(H) \\ & & \\ S1 & \rightarrow & P_2^{S1}(H) > P_1^{S1}(H) \end{array}$$

Given this, he argues that $P_0(H) > P_1(H)$.

But if we want to derive the inequality, we want to get both of these verdicts in a single model. We want an appropriately related supermodel of both $S0$ and $S1$ into which we can import these verdicts.

But there are no supermodels of both $S0$ and $S1$: they don't share the same times.

We can add times to $S0$ and $S1$, but then some claims will become context sensitive, and we can't use LC to derive the verdicts.

There are similar cases (Technicolor Sleeping Beauty, etc.) to which the account does directly apply, and one can argue that these accounts are relevantly similar, etc.

But again, it would be interesting to see is if there's a way to extend the LC+CMP package so that it applies directly to the tweaked Sleeping Beauty case.