# Epistemic Priority and Conditionalization

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## 1 The Intuition

- **Theft at the Mansion**: You're investigating a theft at the mansion, and you start by examining the grounds around the mansion. On the basis of the evidence you collect (footstep patterns, degree and nature of the damage to the back door, etc.), you come to assign a credence of .8 to the proposition that this was an "inside job"—i.e., that the thief is a member of the mansion staff. (Suppose that you're somehow certain that it was a "one-man job.") You have no idea how many members of the mansion staff there are (though let's suppose that you were already certain that there was a mansion staff of at least one person). As you're heading inside to conduct interviews with the suspects, you learn that there are five members of the mansion staff—the butler, the maid, the groundskeeper, the chef, and the chauffeur. Having no information about the members of the staff, you assign a credence of .16 each to the propositions that the butler did it ($A$), that the maid did it ($B$), that the groundskeeper did it ($C$), that the chef did it ($D$), and that the chauffeur did it ($E$). But before you get a chance to interview the witnesses, you learn that there is video proof of the fact that the maid has been out of town for the past month, and so has an extremely solid alibi. So, you rule out $B$.

- I claim: Your credence that it was an inside job should remain at .8. Your credence in each of $A$, $C$, $D$, and $E$ should go up to .2. Your credence that it was not an inside job should stay at .2.

- Argument: If, upon entering the mansion, you had learned that there were four (rather than five) members of the mansion staff, you would have assigned .2 to each member. And what epistemic difference could there be between, on the one hand, learning that there are four members of the staff and, on the other, learning that there are five members of the staff but that one of them is out of town and hence couldn't have done it?

## 2 Red Herrings

- **Bill's Summer House**: I'm certain that Bill has exactly one summer house; I just don't remember whether it's located in New Hampshire or Vermont. Suppose that my credence is split evenly (.50–.50) between the proposition that Bill owns a summer house in New Hampshire ($N$) and the proposition that Bill owns a summer house in Vermont ($V$). I'm 80% sure that Bill is at his summer house right now ($H$), wherever it is located. Then, I place a call to the Vermont Department of Public Records, who tells me that Bill owns no home in Vermont ($E$).

- Intuition: My credence in $H$ should stay at .8, and the .4 that I assigned to $V \wedge H$ should all go to $N \wedge H$.

- But the Conditionalizer can deliver this verdict: I don't just learn $\neg(V \wedge H)$. I learn something stronger: $\neg V$ (i.e.,$\neg(V \wedge H) \wedge \neg(V \wedge \neg H)$)

- Same in Monty Hall case (where I originally "select" door #1): Monty Hall's testimony that the prize is not behind door #2 rules out not just the proposition that the prize is behind door #2, but also the proposition that the prize is behind door #1 and yet Monty Hall decided to tell me that prize isn't behind door #3.

- Not so in **Theft at the Mansion**: there I really do just learn $\neg B$

## 3 A Principle

- Priveleged Redistribution Disjunction Version: If your antecedent credence in $A \vee B$ was $x$, and then you learn that $\neg B$, your credence in $B$ should go to 0, and the $x$ that you had assigned to $B$ should be redistributed to $A$ (thereby retaining your credence in $A \vee B$ of $x$).

- Problem 1: Inconsistent. I start off with credences of $\frac{1}{3}$ each in $A$, $B$, and $C$. So I have credences of $\frac{2}{3}$ each in $A \vee B$, $A \vee C$, and $B \vee C$. Priveleged Redistribution Disjunction Version entails that I should retain my original credence of $\frac{2}{3}$ in each of $A \vee B$ and $B \vee C$. But (since my new credence in $B$ is 0) this requires me to assign a credence of $\frac{2}{3}$ to each of $A$ and $C$, which is inconsistent since $A$ and $C$ are mutually exclusive.

- Problem 2: It's crazy to think that I should retain my credence of $\frac{2}{3}$ in either $A \vee B$ or $B \vee C$ in the following case:

**Where Are My Keys?**: I forget where I left my keys, but there are only three places they could be: my dresser ($A$), the counter ($B$), and the table ($C$), and my credence in each is $\frac{1}{3}$. Since the counter is closest, I decide to look there first, and my keys are not there. So, I learn $\neg B$.

- So we've got to come up with some more restricted principle.

# 4 Epistemic Priority

- Dempster-Shafer Theory, Jim Pryor's view in "Uncertainty and Undermining"
- Some other places where relative epistemic priority seems relevant: Foundationalism vs. Coherentism, Transmission Failure, Induction, Undermining vs. Rebutting Defeat.
- "Fuzzy" interpretation, objections from White and Elga
- "Non-fuzzy" interpretation which retains importance of relative epistemic priority relations
- PRIVELEGED REDISTRIBUTION EPISTEMIC PRIORITY VERSION: Suppose that your antecedent credence in $A \vee B$ was $x$, that your antecedent credence in $A$ was $y$, and that your antecedent credence in $B$ was $z$. Then you learn that $\neg B$.

  If the antecedent constraint that your credence in $A \vee B$ be $x$ is more fundamental than the antecedent constraints that your credence in $A$ be $y$ and that your credence in $B$ be $z$, then the $z$ that you had assigned to $B$ should all go to $A$, thereby retaining your credence in $A \vee B$ of $x$.

  If the antecedent constraint that your credence in $A \vee B$ be $x$ is less fundamental than the antecedent constraints that your credence in $A$ be $y$ and that your credence in $B$ be $z$, then the $z$ that you had assigned to $B$ should be redistributed by Conditionalizing, perhaps reducing your credence in $A \vee B$ from $x$.
- In **Where Are My Keys?**, credences in disjunctions are less fundamental than credences in atomic propositions. So we Conditionalize like normal.
- In **Theft at the Mansion**, credence in disjunction is more fundamental than credences in atomic propositions. So we retain our credence in the disjunction.

## 5 Some Pro-Conditionalization Considerations That I Don't Need To Worry About

- Conditionalization isn't "notation-dependent"
- Conditionalization doesn't "over-support crazy views"

## 6 Some Pro-Conditionalization Considerations That I Do Need To Worry About

- What if there were 1,000,000 members of the mansion staff and 999,999 were exonerated?
- If I had found out that the maid *didn't* have an alibi, that would have been some evidence *for* the maid's guilt, and hence some reason to *increase* my credence from .8 that it was an inside job. And if a test has any results that should lead to increasing my credence in $H$, then it must also have some results that should lead to decreasing my credence in $H$. But the only result of this "test" other than learning that the maid *doesn't* have an alibi is learning that she *does* have an alibi, which is what actually happens in **Theft at the Mansion**. So, learning that the maid does have an alibi must be reason to lower from .8 my credence that it was an inside job, contrary to PRIVELEGED REDISTRIBUTION EPISTEMIC PRIORITY VERSION.
  - Response 1: Deny the principle that if a test has any results that should lead to increasing my credence in $H$, then it must also have some results that should lead to decreasing your credence in $H$. The intuitive thought supporting this principle is something in the neighborhood of van Fraassen's "Generalized Reflection Principle," but there are lots and lots of counterexamples to Reflection.
  - Response 2: Deny that, if I were to find out that the maid has no alibi, then I should increase my credence that it was an inside job. Accept that finding out that the maid has no alibi should somewhat increase my credence that *the maid* did it, but claim that that increased credence that the maid did it should "come" from the other members of the staff, thereby lowering my credence that each of them did it, and leaving my credence unchanged at .8 that it was an inside job.
- Dynamic Dutch Book
  - Let INSIDE be the proposition that it was an inside job.
    Let MAID be the proposition that it was the maid.
    Let $p_1$ be my earlier credence function, before learning whether MAID is true or not.

Let $p_2$ be my later credence function, after learning that MAID is false.

This should all be uncontroversial:
$p_1(\text{INSIDE}) = .8$
$p_1(\text{MAID}) = .16$
$p_1(\neg\text{MAID}) = .84$
$p_1(\text{INSIDE}\wedge\neg\text{MAID}) = .64$
$p_1(\text{INSIDE}|\neg\text{MAID}) = .64/.84 \approx .762.$

My further claim is:
$p_2(\text{INSIDE}) = .8$

Here's a diachronic dutch book that I seem to be committed to:
(1): At $t_1$, Bookie sells me an unconditional wager that pays \$.10 if $\neg$MAID. He charges me $.84 \times \$.10 = \$.084$.
(2): At $t_1$, Bookie buys from me the following conditional wager, which is conditional on $\neg$MAID: a wager which pays \$1 if INSIDE is true (and \$0 otherwise). He pays me $.762 \times \$1 = \$.762$.
If MAID is true, I lose \$.084 on (1), and (2) is called off. My net: -\$.084.
If MAID is false, I make \$.016 on (1). But then (3): At $t_2$, Bookie sells me an unconditional wager that pays \$1 if INSIDE is true (and \$0 otherwise). He charges me $.8 \times \$1 = \$.80$.
If INSIDE is true, I make \$.016 on (1), I lose \$.238 on (2), and I make \$.20 on (3). My net: -\$.022.
If INSIDE is false, I make \$.016 on (1), I make \$.762 on (2), and I lose \$.80 on (3). My net: -\$.022.
So, I lose money no matter what.

My response: I want more than \$.762 for (2). In particular, I want \$.80. My attitudes about the value of (2) are influenced by my value for $p_2(\text{INSIDE})$, not $p_1(\text{INSIDE}|\neg\text{MAID})$. After all, I'm not a Conditionalizer, so the vertical bar has no special significance for me—I just understand $p(A|B)$ as an abbreviation for $\frac{p(A\wedge B)}{p(B)}$, but that quantity has nothing whatever to do with the credence that I would have in $A$ if I were to learn $B$, and hence nothing whatever to do with the amount of money that I want for (2).

# 7 Some Applications

- Articulating the "Equal Weight View" in a coherent way
- Sleeping Beauty (Derek has some interesting ideas here)