COMMENTS ON LYDIA McGREW: IS FOUNDATIONALISM GOOD FOR BAYESIANISM?

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A PROBLEM FOR BAYESIANS

$P(E)$ changes to $Q(E)$. What should be $Q(H)$?

- Case 1: $Q(E)=1$. Then $Q(H)=P(H|E)$.
- Case 2: $Q(E)<1$ and [$P(E)$ changes to $Q(E)$ because some $P(F)$ changes to $Q(F)=1$]. Then $Q(H)=P(H|F)$: Bayesian conditionalization on F.
- Case 3: $Q(E)<1$ and ~[$P(E)$ changes to $Q(E)$ because some $P(F)$ changes to $Q(F)=1$]. Then $Q(H)=P(H|E)Q(E)+P(H|{\sim}E)Q({\sim}E)$ (Jeffrey conditionalization) *if* posteriors are rigid [i.e., $Q(H|E)=P(H|E)$ & $Q(H|{\sim}E)=P(H|{\sim}E)$].
- The problem: When are posteriors rigid?

STRONG FOUNDATIONALISM AND McGREW BAYESIANISM

- According to *strong foundationalism* (SF): (*) P changes to Q only if the foundations change. Two possible kinds of such changes:
  - Addition: $P(F)<1$ changes to $Q(F)=1$.
  - Deletion: $P(F)=1$ changes to $Q(F)<1$.
- Jeffrey denied (*), so SF conflicts with, and thus cannot be good for, *Jeffrey* Bayesianism. SF is at most good for *McGrew* Bayesianism, which accepts (*).

DOES STRONG FOUNDATIONALISM SOLVE THE PROBLEM?

- Lydia's result: If [$P(E)$ changes to $Q(E)$ because some $P(F)$ changes to $Q(F)=1$], then $Q(H|E)=P(H|E)$ iff $P(H|EF)=P(H|E)$; i.e., iff E screens off F from H.
- Objection: This result applies only to Case 2 (and 1), but the problem arises only in Case 3.
- Lydia's reply: Even in Case 2, JC is not redundant, in the sense that a JC on E shows better (than a BC on F) the "fine structure of a rational evidential corpus".

THE DELETION PROBLEM

- My reply: It is the mathematical result, not SF per se, which is good for McGrew Bayesianism.
- A rejoinder: Those who reject SF can *accept* the result but cannot always *apply* it.
- My response: Even SF cannot always apply the result. It applies only to cases of *addition*. Lydia's attempted generalization of the result to cases of *deletion* fails.

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THE PROBLEM OF MUTUAL SUPPORT & TIM'S SOLUTION

- The problem: How can foundationalists who ban loops model legitimate mutual support?
- Step 1: Classical evidence tree

  $F_1 \rightarrow H_1 \leftrightarrows H_2 \leftarrow F_2$
- Step 2: Bayesian network

  $F_1 \leftarrow H_1 \leftarrow H_2 \rightarrow F_2$
- Step 3: McGrew evidence tree

$$\begin{array}{ccccccc} & \rightarrow & & \rightarrow & & & \\ F_1 & & H_1 & & H_2 & & F_2 \\ & & & \leftarrow & & \leftarrow & \end{array}$$

- Tim's solution: The circle in the classical tree should be split into two lines of evidence.

REMARKS ON THE SOLUTION

- The Bayesian network is redundant: Its construction *presupposes* the screening off conditions which are used to construct the lines of evidence.
- Why does screening off always hold in cases of legitimate mutual support? If it does not, the solution provides no way to split a circle into distinct lines of evidence.
- What if a candidate line of evidence is circular? Why and how should it then be split?

AN EXAMPLE OF A LOOP OF SUPPORT

- Let A, B, C be independent binary variables with success probabilities .5, .6, .7.
- Let X=A, Y=AB, Z=ABC, W=AC.

$$\begin{array}{ccc} Y & \leftrightarrows & Z \\ \downarrow\uparrow & & \downarrow\uparrow \\ X & \leftrightarrows & W \end{array}$$

- Every two variables are positively relevant to each other, and every variable screens off its two adjacent variables from each other.

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$$\begin{array}{ccccccc} & & Y & \leftrightarrows & Z & & \\ & & \downarrow\uparrow & & \downarrow\uparrow & & \\ F_1 & \rightarrow & X & \leftrightarrows & W & \leftarrow & F_2 \end{array}$$

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LESSONS FROM THE EXAMPLE

- There seems to be no non-arbitrary way to split the circle into distinct lines of evidence.
- So why insist that the circle *must* be split, that no line of evidence contains a circle? Why must foundationalists ban loops?
- The example responds to Tim's claim that "there can be no benign meaning to the concept of anti-foundational loops of support".