Commutativity or Holism?
A Dilemma for Jeffrey Conditionalizers

Two Desiderata

Commutativity: The order in which you learn information shouldn't matter to your final epistemic state, provided the same total information is gleaned in the end.

- ▷ Whether you read the *Times* editorial or the *Post* editorial first shouldn't matter to your ultimate conclusion about the President's competence.

Holism: The effect an experience should have on your beliefs doesn't just depend on what the experience is like — it depends on your background beliefs too.

- ▷ The room feels hot. Whether you should think it really is depends on whether you have a fever, are wearing a sweater, etc.

JEFFERY CONDITIONALIZATION

Jeffrey Conditionalization (JC) When an experience directly affects your credences over a partition $\{E_i\}$, setting them to the values $q(E_i)$, your new credence in any H should be:

$$q(H) = \sum_i p(H|E_i)q(E_i)$$

- ▷ $\{E_i\}$ is the *input partition*, the $q(E_i)$ are the *input values*.
- ▷ JC is equivalent to the conjunction of

  Success: keep the input numbers as posteriors.
  Rigidity: keep the $p(H|E_i)$ as the $q(H|E_i)$.
- ▷ We'll often simplify by just talking about the special case where the input partition is $\{E, \overline{E}\}$.

JC FOR DUMMIES

▷ In the special case where the input partition is $\{E, \overline{E}\}$,

$$q(H) = p(H|E)q(E) + p(H|\overline{E})q(\overline{E})$$

We'll simplify by doing everything in terms this special case.

JC and Commutativity

- ▷ JC is not commutative on input numbers.
  - ◦ Suppose we do a JC update on E with the input number $1/3$, and then again with input $2/3$. E's final probability is $2/3$.
  - ◦ But if we do the same updates in reverse order, E's final probability is $1/3$.
- ▷ But reversing the input numbers doesn't amount to reversing the experiences. (Lange, 2000)
  - ◦ Let E = *The raven is black*.
  - ◦ To go from $1/2$ to $1/3$ to $2/3$ requires a not-so-black appearance followed by a substantially more black appearance.
  - ◦ Reversing those experiences would lead to a sequence more like $1/2$ to $4/5$ to $2/3$.

JC and Holism

Christensen worried whether JC is sufficiently holistic.

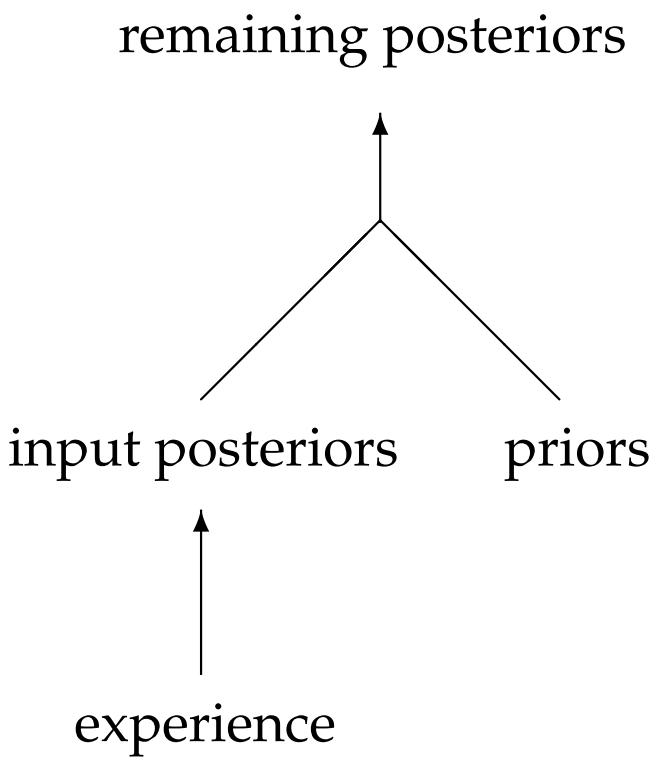
- ▷ The worry: Holism says that there are no foundational, theory-free beliefs. The epistemic import of experience cannot be isolated because there is no clean line between the experiential and the theoretical.
  - ○ But JC assumes that the import of experience can be isolated, as input values over a partition.
- ▷ The resolution: JC allows the input values to depend on background belief. In that sense, they don't have to represent the theory-free import of experience.

Two Types of Foundationism

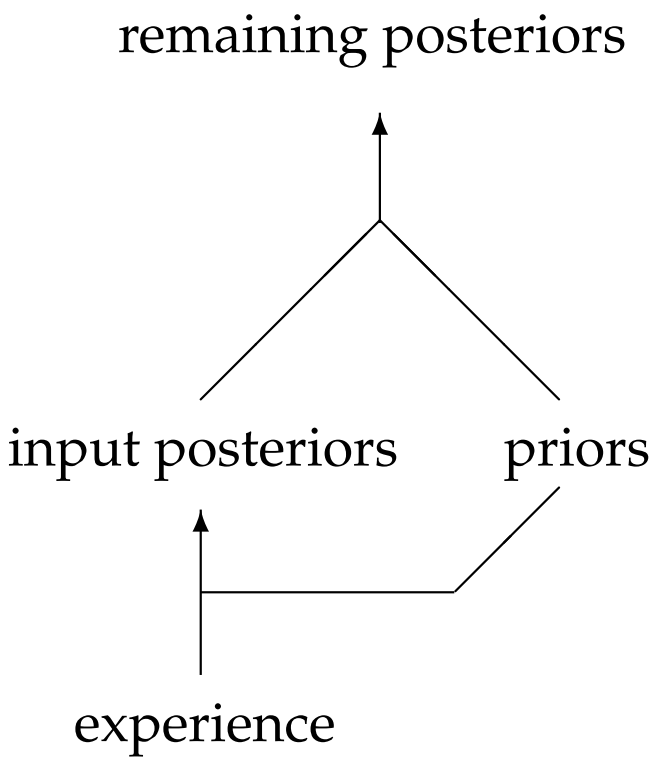
Christensen is applying an important distinction between two types of foundationism:

1. **Externalist Foundationism**: experience fixes posteriors over a foundational partition, and all other posteriors are determined from there (with the help of priors).
2. **Internalist Foundationism**: experience *and priors* fix posteriors over a foundational partition, and all other posteriors are determined from there (with the help of priors).

EXTERNALIST AND INTERNALIST FOUNDATIONISM



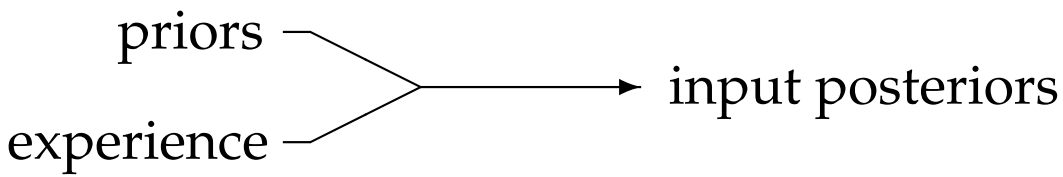
EXTERNALISM



INTERNALISM

The Open Question

- ▷ Christensen and Lange have put down arguments that JC is non-commutative and anti-holistic.
- ▷ This leaves open the question whether there is a solution to the *inputs problem* that satisfies both commutativity and holism.
  - ◦ That is, can we give a rule for the



component of the internalist picture, such that the order of experience doesn't matter.

FIELD'S PROPOSAL

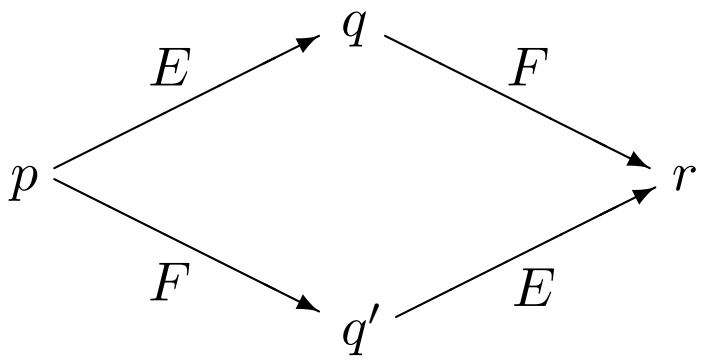
- ▷ The contribution of an experience is represented by a positive real number, α.
- ▷ To determine $q(E)$ based on α and the priors, assume that α is the bayes-factor:

$$\alpha = \beta_{q,p}(E, \overline{E}) =_{df} \frac{q(E)/q(\overline{E})}{p(E)/p(\overline{E})}$$

- ▷ Pro: makes JC commutative.
- ▷ Con: repeating the same experience yields unlimited support for E. (Garber, 1980)

WAGNER'S RESULT

▷ In the following update scheme:



if the updates happen by JC on the propositions indicated then

$$\beta_{q,p}(E, \overline{E}) = \beta_{r,q'}(E, \overline{E})$$

$$\beta_{q',p}(F, \overline{F}) = \beta_{r,q}(F, \overline{F}).$$

▷ Only Field's proposal can make JC commutative!

The Dilemma

- ▷ Field's proposal is the only way to get commutativity on experiences, but it's almost completely anti-holistic.
  - ◦ The only prior that influences the impact of the experience on an input proposition E is $p(E)$.
    - ▷ Garber's repeated experience objection exploits this flaw — your belief that you just had such an experience, and already drew conclusions from it, can't undercut the experience's support when repeated.
- ▷ So we have to choose: commutativity or holism?

Some Details

- ▷ Wagner's result only applies when E and F are probabilistically consistent, but that condition is usually satisfied.
- ▷ We don't always want experience commutativity.
  - ◦ Watching someone walk into a room suggests very different things from watching them back out.
- ▷ But we do want limited commutativity on experiences; sometimes the order of experiences won't matter to some hypotheses.
  - ◦ Whether I see or hear the rain first, I'll conclude that it's raining with the same level of confidence.
  - ◦ All we need for the theorem is a case where the order of experience shouldn't matter to the distribution over $\{E, \overline{E}\} \times \{F, \overline{F}\}$.

Constructing a Problem Case

- The structure of a problem case:
  - The final values over $\{E, \overline{E}\} \times \{F, \overline{F}\}$ should be order-invariant
  - But the support for E should depend on F.
  - E.g., an experience supports E, but F defeats that support.
- So: the cloth looks blue, suggesting that it is blue (E), but then we notice that the lighting is deceptive (F).
  - Whether we see the cloth or the light fixtures first shouldn't make a difference to our final credences.
  - If the appearance of the blue cloth supports E before the tricky lighting is spotted, it must have a $\alpha > 1$.
  - But then it supports E even after the tricky lighting is spotted — goodbye holism.

Pointing the Finger

- ▷ Where does JC go wrong? Rigidity breeds anti-holism.
- ▷ If an experience can't change the input proposition's conditional probabilities, it can't set up a defeater:
  - ◦ Given rigidity, if $q(E|F) < q(E)$ then $p(E|F) < p(E)$.
  - ◦ So as long as F didn't tell against E to begin with, it can't eliminate the support that the experience gave to E.
  - ◦ Thus learning about a defeater of the experience's support after the fact can't undo that support.
- ▷ Commutativity just serves to make the problem time-symmetric:
  - ◦ If we demand the same final state even if the defeater is discovered first, defeaters get ignored entirely.

Another Way of Putting It

- ▷ Suppose we measure how much F confirms E using the likelihood-ratio measure:

$$l_p(E, F) =_{df} \frac{p(F|E)}{p(F|\overline{E})}$$

- ▷ Then rigidity prevents JC from altering the extent to which F confirms/disconfirms E.
- ▷ So, however much F counteracts the support E got from the first experience is just the degree to which F was evidence against E itself in the first place.
- ▷ JC can't express the difference between these two scenarios:
  1. F is an opposing defeater for E.
  2. F is an undercutting defeater for E.

Moral of the Story

- ▷ JC was designed to free probabilism from strong foundationism, but foundationism had several distinct problematic features.
- ▷ JC frees probabilism from *certaintism*, but not *givenism*.
  - ◦ We still assume that foundational beliefs are the stems of all inference — their evidential connections determine *everything* we learn from experience.
- ▷ What we can't learn, then, is that a foundational proposition has an evidential connection that we didn't see before.
- ▷ Because experience is screened off at the foundations, the extent to which it can be doxastically examined and managed is drastically limited.

TURNING THE TABLES?

- ▷ A commutativity-based defense of rigidity:
  - ◦ A defeater learned after the fact shouldn't undercut support unless the source of the support was recorded.
  - ◦ But if the support is recorded then something else was learned and we haven't properly chosen the input partition.
  - ◦ By commutativity then, if the defeater is discovered first, it should only undermine the support if the source is recorded.
  - ◦ In no case, then, do we have doxastic defeat of non-doxastic reasons, i.e. radical holism.
- ▷ In general: if the $e \rightarrow E$ connection can be undercut, it must be mediated by an E^*. The correct representation is $e \rightarrow E^* \rightarrow E$ and what gets undercut is the $E^* \rightarrow E$ connection.

Formal Meets Traditional

- Whether or not this general picture is defensible takes us straight into the foundationism/internalism debates in traditional epistemology.
  - Maybe we can argue that arguments for holism trade on reflective intuitions — intuitions about reflective cases.
  - Treatment of Norman cases:
    - Norman fails to attend and reflect as required.
    - Given that failure, what norman does is rational.
  - Etc.
- Bottom line, looks like JC takes a stand on one major debate in traditional epistemology.