Phil 184/284: Formal and Informal Epistemology
Lecture 3 Handout
John Wilcox
Department of Philosophy & Department of Psychology
Stanford University

Topics:
1. Bayesian transition theory
2. Background to conditional commitment
3. Views on conditionality
4. Two worries about conditionality
5. Binary view's approach to worries
6. Nozick-Harman point
7. Tertiary view's approach to worries
8. Discussion questions

Bayesian transition theory:
- Bayesian transition theory:
  - Concerns how a rational agent changes their credences over time
- "The" Bayesian transition rule:
  - Jeffrey conditionalization
    - **For every *C*:**

$$(\text{J-Cond}) \quad cr_{new}(C) = \{[cr_{new}(A) \times cr_{old}(C/A)] + [cr_{new}(\neg A) \times cr_{old}(C/\neg A)]\}.$$

  - Compare to this rule of inference:
    - Modus ponens:

$$A \to C$$
$$\underline{A}$$
$$\therefore C.$$

  - (Optional) J-Cond is not a rule of inference:
    1. J-Cond takes as input *many* attitudes before updating and *many* attitude types (that vary by strength), not just a *few*
    2. J-Cond produces as output *many* attitudes after updating and *many* attitude types, not just a *few*
    3. J-Cond output is just coherence of overall state which might not be based on the specific input (supposedly)
    4. J-Cond changes occur at the level of *attitudes*, but not on the basis of what is implied by content
  - J-Cond concerns kinematics:
    - Rational kinematics describes structural regularities manifested in a system as it changes over time
      - J-Cond regularities:
        - conditional credence strengths remain the same
        - unconditional credences are based on the structure of the above equation

Background to conditional commitment:
- o Basic terminology:
    - i. Conditional credence $cr(C|A)$
        - o = one's credence in the consequent C conditional on the antecedent A
            - a. E.g. My confidence that this Cameron is happy given that Alice is happy
    - ii. Indicative credence $cr(A \rightarrow C)$
        - o = one's credence in the *indicative conditional* that if C, then A
            - a. ($\rightarrow$ is not material implication)
            - b. $A \rightarrow C$:
                - i. = If A, then C
                - ii. = A implies C
            - c. E.g. My confidence that Cameron is happy if Alice is happy
    - iii. Conditional commitment:
        - o = conditional credence, indicative credence or both
    - iv. Unconditional commitment:
        - o = $cr(P)$ for some proposition P
- o Views on relations between conditional commitment and unconditional commitment:
    - i. Ratio norm:
        - o Because of normative stipulation (not definition):

$$cr(C/A) = cr(A\&C)/cr(A).$$

    - ii. Ramsey's norm:
        - o Indicative credence is equal to conditional credence

$$(R =) \quad cr(A \rightarrow C) = cr(C/A).$$

Views on conditionality:
- Terminology:
    - o Epistemic possibility (or possible world):
        - ▪ A complete way that the world could be—consistent with your knowledge:
            - ● E.g. For all you know, the world could be such that the coin lands heads, Obama is smiling right now, a bird flies by my window etc.
- A. Binary view of conditionality:
    - a. Ramsey norm + *indicative* credence is basic
    - b. Conditional commitment involves two things:
        - i. *One* thinker giving credence to *one* proposition of the form $A \rightarrow C$
    - c. Features of the view:
        - i. Conditionals (purport to) state facts about the world
            - 1. $A \rightarrow C$ is like the claim that Obama is smiling right now
        - ii. Indicative/conditional credence is a distribution of credence **over epistemic possibilities where $A \rightarrow C$ is true**
- B. Tertiary view of conditionality:
    - a. Ramsey norm + *conditional* credence is basic
    - b. Conditional commitment involves three things:
        - i. *one* thinker being in a relation to *two* propositions of the form A and C (we'll see what this amounts to later)
    - c. Features of the view:
        - i. Conditionals dot not state facts about the world

      ii. Indicative/conditional credence is a distribution of **credence in *C* when our vision is restricted to the epistemic possibilities where *A* is true**

      iii. Restricted-vision approach to conditionality:

        1. Entailed by Ratio and Ramsey norms

        2. Strength of conditional commitment is like a distribution of credence over a subset of epistemic possibilities where the antecedent is true

  d. (Optional) Tool for understanding:

    i. Suppositional credit (credence?):

      1. Suppositional credit in *C* is the credence you would have in *C* if you supposed *A* was true

    ii. Identity of strength thesis:

      1. $cr(C/A) = sup_A[\mathbf{cred}(C)]$,

    iii. This, with Ramsey's norm, entails Suppositional Ramsey Norm:

      1. (SRN) $cr(A{\rightarrow}C) = sup_A[\mathbf{cred}(C)]$.

  e. (Optional) Two ways of adopting tertiary approach:

    i. One restricted-vision attitude:

      1. Suppositional credit is just conditional credence, and vice versa

      2. Suppositional credit can be *sub-conscious* like breathing

        a. E.g. the sub-conscious conditional credence"If Sascha isn't really named Sascha, then she has been misled about her name"

    ii. Two restricted-vision attitudes:

      1. Suppositional credit is not conditional credence

      2. The former is conscious but the latter is sometimes not

C. Dualism about conditionality:

  a. Ramsey norm is false

Two worries about conditionality:

- Bayesian models accepts:
  - Jeffrey conditonization
    - (J-Cond) $cr_{new}(C) = \{[cr_{new}(A) \times cr_{old}(C/A)] + [cr_{new}(\neg A) \times cr_{old}(C/\neg A)]\}$.
  - Rule (like the Law of total probability)
    - (cr_{new}) $cr_{new}(C) = \{[cr_{new}(A) \times cr_{new}(C/A)] + [cr_{new}(\neg A) \times cr_{new}(C/\neg A)]\}$.
- This entails:
  - $cr_{old}(C/A) = cr_{new}(C/A)$
  - (Assuming the Ramsey Norm) Updating assumption:
    - When credence for *A* is shifted by new input, credence lent to any conditional of the form $A \rightarrow C$ remains unchanged
- We then have two worries:
  - The rigidity worry:
    - A conditional commitment will never change when credence in the antecedent *A* changes
  - The incompleteness worry:
    - When need a story about when conditional commitment should change (even if changing credence in *A* does not change that commitment)
  - Conditional commitment is self-standing and not a ratio of other commitments, so why couldn't it change in these ways?

Binary view approach to these worries:
- o Adopt binary view of conditionality:
    - $A \rightarrow C$ is a fact stating claim
    - Therefore, it can be an input and output of Jeffrey conditionalization
- o Rigidity worry:
    - Just do J-cond for $A \rightarrow C$ as output:
        - $cr_{new}(A \rightarrow C) = cr_{old}(A \rightarrow C|A) \times cr_{new}(A) + cr_{old}(A \rightarrow C|\neg A) \times cr_{new}(\neg A)$
        - Hope that $cr_{new}(A \rightarrow C)$ is rigid
- o Incompleteness worry:
    - Just do J-cond for $A \rightarrow C$ as input:
        - $cr_{new}(C) = cr_{old}(C|A \rightarrow C) \times cr_{new}(A \rightarrow C) + cr_{old}(C|\neg(A \rightarrow C)) \times cr_{new}(\neg(A \rightarrow C))$
        - Hope that $cr_{new}(C)$ changes appropriately
- (Optional) Problems with the approach:
    - o Ratio norms and Ramsey's norm entail these properties
        - $(\neg\text{Dist}\rightarrow)$ $cr[\neg(A\rightarrow C)]$ $=$ $cr(A\rightarrow\neg C)$.
          (cr-I/E) $cr[A\rightarrow(B\rightarrow C)]$ $=$ $cr[(A\&B)\rightarrow C)]$.
          (Pres-NC) $cr(A\rightarrow C)$ presumes A is not an explicit contradiction
          (UAA) $cr(A\rightarrow C)$ assumes that A is not a conditional.
    - o Properties show the approach is hopeless:
        - For example, how should $cr_{new}(A \rightarrow C)$ change when $cr_{new}(A)$ changes?
            - A shift in confidence in A from 80% to 90% yields a credence of 100% - a contradiction
- Conclusion: binary view is wrong

Nozick-Harman point:
- o Terminology:
    - Rule of entailment:
        - Tells you what propositions entail others
            - o E.g. disjunctive syllogism:
                - A = Apples are in the fridge
                - M = Martians are in the White House

                $$\frac{A \text{ or } M}{\neg A}$$
                $$\therefore M.$$
    - Rule of inference:
        - Tells you what attitudes you should have on the basis of other attitudes
- o Nozick-Harman point
    - Sometimes, a rule of entailment is not a rule of inference
    - More specifically, sometimes:
        1. One believes p (to some degree)
        2. One gets evidence for q
        3. They believe q (to some degree)
        4. p and q entail a conclusion C (in accordance with a rule of entailment)
        5. But it is more reasonable to retract p than to infer C

- Modus ponens:
  - The rule:
    - $$A \rightarrow C$$
      $$\underline{A}$$
      $$\therefore C$$
  - Sturgeons claim:
    - Nozick-Harman point does not apply to modus ponens
      - i.e. There is no case where you are committed to $A \rightarrow C$, you rationally become confident in A, and should then reduce your confidence in $A \rightarrow C$
  - (Optional) Support for Sturgeon's claim:
    - Problem case 1:
      - Marble machine has a tree with two forks: first A or not A, and then C or not C
      - You know the chance for C given A is equal to the chance of A, and then you learn the chance for A shifts from 70% to 80%
      - Then, it seems changing your credence for A should change your credence that if A, then C
      - Reply:
        - This case involves *fixed* conditional credences like $cr(C|chance\ of\ A\ is\ 80\%)$ – the conditionals don't change
    - Problem case 2:
      - Similar to 3
    - Problem case 3:
      - You're confident that if you will touch some copper wire, you'll die
      - PATH is a person who predicts what will make you happy, and PATH testifies you will touch the copper wire
      - You become more confident that you'll touch the wire and less confident that if you will touch the copper wire, you'll die
      - Reply:
        - This is contentious because of two interpretations:
          - Dogmatic approach to testimony:
            - You become *directly* more confident in A because of testimony that A
          - Non-dogmatic approach to testimony:
            - You become *indirectly* more confident in A because you become confident in "Testifier T testifies that A"
            - But you always had low confidence that "If PATH says you will touch the wire, then if you touch the wire, you will die"
    - Problem case 4:
      - Sturgeon get abducted and returns to say "If I ever begin an announcement, they will cremate the human race within an hour"
      - You become confident in this indicative conditional, but then sometime later, after more investigation, Sturgeon says he'll make an announcement

- Since you trust him as sensible, you become more confident he'll make an announcement and less confident that "If I ever begin an announcement, they will cremate the human race within an hour"
  - Reply:
    - Way to determine whether indicative is true is to suppose antecedent is true and then consider credence in consequent
    - But either you thought of me as sensible or not
    - If so, then you would not have had a low indicative credence in the first place
    - But if not, then your indicative credence would not have changed
- Conclusions:
  1. Modus ponens is an obligatory pattern of inference
  2. This favors and is explained by tertiary approach to conditionality because:
     - $A \rightarrow C$ does not state facts like $A \lor M$ or $A\&B$
     - Rather, $cr(A \rightarrow C)$ is credence in C among the possibilities where A is true
     - But changing credence in A only changes credences for A, not the credence in C among the possibilities where A is true

Binary view approach to these worries:
- Rigidity worry:
  - Rigidity is expected because of conclusion 2 immediately above
- Incompleteness worry:
  - (Optional note):
    - Rigidity worry concerns changes in conditional credence **brought on by changes in credence for** A
    - Incompleteness worries concerns changes in conditional credence that are **not brought on by changes in credence for** A
  - Extend Bayesian approach
  - Rationale for Jeffrey conditionalization:
    - Make the minimal change in attitudes to regain equilibrium: change just credences for A but keep conditional credences the same
    - It concerns probabilities over A and $\neg A$ possibilities, not probabilities for C and $\neg C$ within those possibilities
  - Applying the rationale to changing conditional credence:
    - Make the minimal change in attitudes to regain equilibrium: change just conditional credences—change credences for C within the A possibilities, but keep the credences *about* A and $\neg A$ the same
  - Recovery of Equilibrium After Conditional-credende Transfer (React):
    - $$cr_{new}(\phi) = \left(\left(\frac{cr_{new}(C|A)}{cr_{old}(C|A)}\right) \times cr_{old}(\phi\&A\&C)\right) +$$
    $$\left(\left(\frac{cr_{new}(C|A)}{cr_{old}(C|A)}\right) \times cr_{old}(\phi\&A\&\neg C)\right) +$$
    $$cr_{old}(\phi\&\neg A)$$

Discussion questions:
- Is Jeffrey conditionalization not a rule of inference?
- Is Modus ponens really not susceptible to a Nozick-Harman point?
- Is $A \rightarrow C$ a claim that can state a fact?
- Is indicative credence the same as conditional credence?