LECTURE 4

Trusting Experts - A. Goldman

W4 - ASSIGNMENTS - Goldman

- What alternative does Goldman suggest to the *Acceptance Principle*, as formulated by Burge and Foley, and reported on page 86 of his article? What are his motivations for rejecting the principle, and responding to the arguments that are instead brought to support it?

- Goldman mentions two processes for the evaluation of expertise, *direct calibration* and *indirect calibration*. Can you outline the two? Can you explain in which sense admitting those processes, for the evaluation of an expert's testimony, puts the problem that Goldman deals with outside the context of the *null setting*, which was mentioned in Pritchard's article in WEEK 2?

- What is the "novice/2-experts" problem?

- On page 91 of his article, Goldman provides his account of cognitive expertise in terms that he calls "veritistic" (we will find this concept later on in WEEK 5), that is a concept of expertise that is "linked to the concept of truth". What are the essential conditions, according to such account, for being an expert? (Please distinguish between absolute and comparative conditions.)

- How does Goldman propose to resolve the novice/2-experts problem? List and and briefly explain the five conditions included in his account.

- Goldman mentions the contribution of indirect evidence as one of the possible means a novice has, for evaluating two competing experts. To which extent an expert's dialectical abilities are an indication of her superior knowledge of the object of expertise?

- Section 4 of Goldman's article is largely devoted to fine-tuning the argument that confirmation of an expert's opinion by a different and *independent* expert, should boost a novice's confidence in the correctness or reliability of the first expert. Can you summarize the reasons and arguments Goldman provides for his claims, and specify what is meant by 'independent' in that context?

- Goldman's conclusions are prudent; the picture that arises from his analysis of expertise, in relation to the problem of selecting among experts, is not a clear-cut one. Each method for selecting experts has strings attached, that is, it is valid only granted that certain conditions are met. Moreover, not all methods are equally at hand in a given situation (e.g. the availability of past track-records). How would you summarize the article and Goldman's conclusions, with reference to a desired solution of the "novice/2-experts" problem?

Alvin Goldman's *condition B* (page 97)

4. *Agreement from Other Experts: The Question of Numbers*

An additional possible strategy for the novice is to appeal to further experts. This brings us to categories (B) and (C) on our list. Category (B) invites N to consider whether other experts agree with E_1 or with E_2. What proportion of these experts agree with E_1 and what proportion with E_2? In other words, to the extent that it is feasible, N should consult the numbers, or degree of consensus, among all relevant (putative) experts. Won't N be fully justified in trusting E_1 over E_2 if almost all other experts on the subject agree with E_1, or if even a preponderance of the other experts agree with E_1?

Alvin Goldman (2001) "Experts: Which Ones Should You Trust?" *Philosophy and Phenomenological Research* Vol. LXIII, No. 1

Alvin Goldman's *condition B* continued (page 99-100)

Under a simple Bayesian approach, an agent who receives new evidence should update his degree of belief in a hypothesis H by conditioning on that evidence. This means that he should use the ratio (or quotient) of two likelihoods: the likelihood of the evidence occurring if H is true and the likelihood of the evidence occurring if H is false. In the present case the evidence in question is the belief in H on the part of one or more putative experts. More precisely, we are interested in comparing (A) the result of conditioning on the evidence of a single putative expert's belief with (B) the result of conditioning on the evidence of concurring beliefs by two putative experts. Call the

Alvin Goldman (2001) "Experts: Which Ones Should You Trust?" *Philosophy and Phenomenological Research* Vol. LXIII, No. 1

Bayesian Rules of Evidence: an introduction

- According to Bayesian Epistemology, it is a normative requirement to update one's beliefs on the basis of the available evidence.
- What is it mean to *update one's beliefs on the basis of the available evidence*?
- Categorical vs. conditional probability
  - The probability of drawing an ace from a single 52-card deck is 1/13.
  - The probability of drawing hearts from a single 52-card deck is 1/4.
  - But suppose you know that all the clubs, diamonds and spades are on the table, you are in the middle of an improbable gamble, what is the probability of drawing an ace from that deck?
- The question one should ask is "what is the probability of drawing an ace, given that the card is a heart?"
- The probability of X, given Y, is called *conditional probability*.

Conditional probability

- The *categorical probability* of an event X is represented as P(X).
- The *conditional probability* of an event X, given event Y, is represented as P(X|Y).
- ***NOTA BENE: $P(A) \in [0,1]$, where A = X, Y, Z, ...
- The conditional probability of an event X, given event Y - P(X|Y) - is defined as the *ratio* of the joint probability of X and Y, over the probability of Y: P(X & Y)/P(Y).
- In some cases, the conditional probability of an event is easy to calculate (example of the deck of cards), but that is not always the case.
- In general, in order to calculate the posterior probability of an event, one case use the so called Bayes' Formula (***NOTA BENE: the formula does not always work).

Bayes' Formula

- Thomas Bayes (1702 - 1761) showed that:

$$P(A|B) = \frac{P(B|A)\,P(A)}{P(B)}.$$

- We apply the formula to the example of cards drawing. We want to know, what is the probability of drawing an ace, given that I know I will draw clubs?

P(Ace of Clubs | Clubs)

$$P(A\clubsuit) = 1/52$$
$$P(\clubsuit) = 1/4$$
$$P(\clubsuit|A\clubsuit) = 1$$

$$P(A\clubsuit|\clubsuit) = \frac{P(\clubsuit|A\clubsuit)\cdot P(A\clubsuit)}{P(\clubsuit)} = \frac{1\cdot 1/52}{1/4} = 1/13$$

- **NOTA BENE**: This is not the *easy* way to resolve the specific problem above, we just *know* what the conditional probability of drawing an ace is given we draw clubs. However, there are more complex problems in which Bayes' formula can be helpful for deriving conditional probabilities (for examples, see Ian Hacking (2001) *An Introduction to Probability and Inductive Logic*, Cambridge University Press).

Conditioning on evidence

- The meaning of conditioning on evidence, in the cards example, is that we should change our belief in the probability of the event of an ace being drawn, once we gain evidence of the fact that the only cards are left in the deck are hearths.

- ...**back to Goldman**

- Goldman proves that conditioning on the evidence provided by a single expert, is not always “better” than conditioning on the evidence of two experts. Why is that?

ONE EXPERT TWO EXPERTS

$$\left((1) \quad \frac{P(X(H) / H)}{P(X(H) / \sim H)} \right) < \left((2) \quad \frac{P(X(H) \,\&\, Y(H) / H)}{P(X(H) \,\&\, Y(H) / \sim H)} \right) ?$$

- ‘P(X(H) | H)’ is the probability that expert X believe H, given that H is true. ‘P(X (H) | ~ H)’ is the probability that expert X believe H, given that H is false.

- NOTA BENE: if the value of (1) > 1, then X is a “reliable expert”, if v. of (1) < 1, then X is an “anti-expert”, if v. of (1) = 1, then X is equivalent to a randomizer.

Goldman's demonstration (I)

- Goldman shows that (2) is not always greater than (1).
- Note that (2) is equivalent to (3) (page 100)

Call X(H) 'A' and Y(H) 'B'. Case for the numerator of (2):

$$\begin{aligned}
P(X(H)\cap Y(H)|H) &= P(A\cap B|H) \\
&= \frac{P(A\cap B\cap H)}{P(H)}\cdot\frac{P(A\cap H)}{P(A\cap H)} \\
&= \frac{P(A\cap B\cap H)\cdot P(A\cap H)}{P(A\cap H\cdot P(H)} \\
&= P(B|A\cap H)\cdot P(A|H) \\
&= P(X(H)|H)\cdot P(Y(H)|X(H)\cap H)
\end{aligned}$$

TIP: TO UNDERSTAND THE PROOF TRY TO DERIVE THE NUMERATOR OF (2) FROM THE NUMERATOR OF (3). →

$$\begin{aligned}
P(A|H)P(B|A\cap H) &= \frac{P(A\cap B)}{P(H)}\cdot\frac{P(B\cap A\cap H)}{P(A\cap H)} \\
&= \frac{P(B\cap A\cap H)}{P(H)} \\
&= P(B\cap A|H) \\
&= P(X(H)\cap Y(H)|H)
\end{aligned}$$

Goldman's demonstration (II)

- After showing that (2) is equivalent to (3), Goldman presents the case of the "blind follower": "if Y is a blind follower of X, then anything believed by X (including H) will also be believed by Y. And this will hold whether or not H is true.

$$(3)\quad \frac{P(X(H) / H)\; P(Y(H) / X(H) \;\&\; H)}{P(X(H) / {\sim}H)\; P(Y(H) / X(H) \;\&\; {\sim}H)}$$

$$P(Y(H) / X(H) \;\&\; H) = 1$$

$$P(Y(H) / X(H) \;\&\; {\sim}H) = 1$$

- If Y is a "blind follower" of X, then (2) is equal to (1). Without formalisms, it means that conditioning on (1) is the same as conditioning on (2); in other words, conditioning you belief on one expert's report is the same as conditioning on two experts' reports. But when that is the case, then the principle that conditioning on more experts is better than conditioning on one does not hold without qualifications.

W5 - ASSIGNMENTS I - Goldman

(for A. Goldman, *Knowledge in a Social World*, Chapter 3: The Framework, pp. 69, 100)

- What examples of truth-seeking social practices are illustrated in Goldman's text?
- What are the alternatives to *Veristic Social Epistemology*? For each, what are their tenets?
- What is the goal of *Veristic Social Epistemology*?
- What are the shortcomings we are faced with, when adopting *Veristic Social Epistemolgy*?
- How does Goldman suggest to solve the *selection problem*?
- Goldman refers to two types of circularity. Explain what each type is, and if and why they constitute a problem for veristic epistemology.
- What is the difference between *fundamental veristic value* and *instrumental veristic value*?
- EXCERCISE: *see next page* ASSIGNMENTS II.
- The preceeding exercise applies Goldman's theory of Veristic Analysis to a single *credal agent*. However, Social Epistemology is about groups. How does his theory applies to a group of *credal agents*?

W5 - ASSIGNMENTS II - Goldman

(for A. Goldman, *Knowledge in a Social World*, Chapter 3: The Framework, pp. 69, 100)

EXERCISE:

(this problems should be solved by considering Goldman's theory of Veristic Analysis as exposed in paragraph 3.4: pp. 87, 94, especially pp. 89-last paragraph, 90-bottom.)

PROBLEM: Consider the proposition *P*: "There is water on the moon". Stephan has a certain degree of belief over *P*. Initially, Stephan's 'degree of belief that-*P'* [=BD(*P*)] is equal to .72.

Stephan uses two diferent epistemic practices, π_1 and π_2, in order to check whether *P* is true or not; after using π_1 Stephan's DB(*P*)=.4, and after using π_2 Stephan's DB(*P*)=.73.

TASK 1: Suppose *P* is true. Which epistemic, if any, practice is "better" according to Goldman's theory? Show why. Which one, if any, should be given positive credit?

TASK 2: Carry out *TASK 1*, this time supposing that *P* is false.

TASK 3: Formulate a similar problem where two different epistemic practices should both receive negative credit.