

1. Motivation

1.1. *The internalist-externalist distinction*

Internalism: only a believer's internal (i.e. mental) states can justify her beliefs. Typically internal states are accessible simply by introspection ("knowable by reflection alone").

- All doxastic theories are internalist, as they hold that only beliefs can justify beliefs, and beliefs are clearly internal states.
- However, some internalists reject the Doxastic Assumption, as some perceptual and memory states may justify without being beliefs. (P&C are non-doxastic internalists.)

Externalism: in addition to internal states, other things can justify a person's beliefs.

- Standard "external justifiers" include the reliability of one's belief-forming processes and abilities, and whether the belief is caused in the right way.

1.2. *Why be an externalist?*

1.2.1. *1st Motivation: Worries about doxastic assumption*

- I1. The doxastic assumption is true iff only a belief can justify a belief.
- I2. Perceptual beliefs are typically based on how physical objects causally interact with our senses.
- I3. How physical objects causally interact with our senses is not a belief.
- I4. ∴ If the doxastic assumption is true, then perceptual beliefs are typically not justified. (I1-I3)
- I5. Perceptual beliefs are justified.
- I6. ∴ The doxastic assumption is false: in addition to beliefs, other things can also justify a belief. (I4, I5)

The most direct response to the Isolation Objection is that, in addition to beliefs, we also add physical objects' causal interactions with our senses to the set of things that can justify our beliefs. Those are *external* justifiers.

However, note that even our *unjustified* beliefs are frequently the result of causal interactions with physical objects and our senses. So, how do we distinguish the good causal interactions from the bad ones? A guiding idea is that the good belief-forming processes are those that make our beliefs highly *probable*.

1.2.2. *2nd Motivation: Explaining justification's purpose*

Internalist theories end up involving a complex set of epistemic rules lacking any underlying and systematic unity. This means that there is no way to prove that a particular epistemic rule is correct. We can only gather a hodgepodge of rules that seem intuitively correct.

By contrast, externalists offer the following as the underlying principle: justification is our best means in coming to believe truths. A means should make its end objectively probable. Hence, justification should make true beliefs objectively probable.

2. Reliabilism

Core Reliabilist Idea (CR): *S*'s belief that *p* is justified iff (1) *S* formed the belief that *p* via process *X*, and (2) $\Pr(S\text{'s belief that } p \text{ is true} \mid S\text{'s belief that } p \text{ is the result of } X)$ is sufficiently high, i.e. *X* is a "reliable cognitive process."

- Unlike Bayesianism/probabilism, this probability (a) is an *indefinite* probability, and (b) measures the *objective frequency* of true beliefs relative to the number of beliefs produced by *X*. (See below.)
- *Indefinite* probabilities attach to general classes of properties.
- By contrast, *definite* probabilities attach to particular propositions or states of affairs.

2.1. *Goldman's theory*

Belief-independent cognitive processes, e.g. perception, *do not* take beliefs as their inputs (but beliefs are their outputs.)

Belief-dependent cognitive processes, e.g. inference, *do* take beliefs as their inputs (and beliefs are their also outputs.)

- Belief-dependent processes are *conditionally reliable* iff_{af} they are reliable when the input-beliefs are true.

Reliabilist Justification (RJ): If S 's belief in p at t results from a reliable cognitive process, and there is no reliable or conditionally reliable process available to S which, had it been used by S in addition to the process actually used, would have resulted in S 's not believing p , then S 's belief in p at t is justified.

2.2. Problems for process reliabilism

2.1.1. New evil demon problem

1. It is possible that (a) S is massively deceived in his inputs, (b) uses impeccable reasoning, and (c) produces massively false outputs. Call this person an Epistemically Unfortunate but Responsible Agent. (EURA)
2. If reliabilism is true, then EURAs are not justified in most of their beliefs.
3. EURAs are justified in most of their beliefs.
4. \therefore Reliabilism is false. (1-4)

2.1.2. Clairvoyance objection

1. Suppose that S believes that p on the basis of a reliable cognitive process x .
2. Also suppose that one of the following holds:
 - a. S believes that p is not formed on the basis of x ,
 - b. S believes that x is unreliable,
 - c. S has reasons to believe that p was not formed on the basis of x , or
 - d. S has reasons to believe that x is unreliable.
3. If a, b, c, or d hold, then S is unjustified in believing p .
4. If reliabilism is true, then S is justified in believing that p (1, CR)
5. S is unjustified in believing that p . (2,3)
6. \therefore Reliabilism is false. (4,5)

2.1.3. Generality problem

1. Reliabilism is true iff_{df} S 's belief that p is justified iff (1) S formed the belief that p via process X , and (2) $\text{Pr}(S$'s belief that p is true | S 's belief that p is the result of X) is sufficiently high. (CR)
2. X can be described in maximally specific terms or not.
3. If X is described in maximally specific terms, then a belief is reliably formed only if it is true.
4. However, justified beliefs needn't be true.
5. \therefore If reliabilism is true, then no cognitive process X should be described in maximally specific terms. (1-4)
6. If a cognitive process X is not described in maximally specific terms, then there is no level of specificity at which reliabilism is both true and precise.
7. \therefore If reliabilism is true, then there is no level of specificity at which it is both true and precise. (5,6)

Example for 6:

- *Relatively low level of specificity*: Color vision is unreliable, since most of the universe lacks normal lighting conditions.
- *Relatively high level of specificity*: Color vision is also unreliable in lighting conditions where S has consumed copious amounts of hallucinogens, where S 's eyes are malfunctioning, etc.

3. Probabilism

Epistemic justification is a function of the *definite* probabilities of our beliefs.

3.1. Simple Bayesianism

A person is justified in believing p iff the subjective probability of p is sufficiently high. (*The Simple Rule*)

A rational agent updates her beliefs via *Bayes' theorem*:

$$\text{prob}(h|e) = \frac{\text{prob}(e|h) * \text{prob}(h)}{\text{prob}(e)}$$

The probability calculus:

- *Axiom 1*: $0 \leq \Pr(p) \leq 1$.
- *Axiom 2*: If p and q are logically incompatible with each other, then $\Pr(p \text{ or } q) = \Pr(p) + \Pr(q)$.
- *Axiom 3*: If p is a tautology (i.e. a logical truth), then $\Pr(p) = 1$.

3.2. Subjective probability

Guiding idea: probability is a mathematically precise way of representing the fact that we have *degrees* of belief.

Two interpretations of subjective probability:

Descriptive subjectivism: Probability = a person's *actual* degree of belief in a proposition.

Normative subjectivism: Probability = a person's *rational* degree of belief given his overall situation.

3.2.1. Problem with descriptive subjectivism

1. If descriptive subjectivism is true, then people's degrees of belief conform to the probability calculus.
2. People's degrees of belief do not conform to the probability calculus.
3. \therefore Descriptive subjectivism is false. (1, 2)

3.2.2. Dutch book argument for normative subjectivism

DB1. If your beliefs do not conform to the probability calculus, then one can always make a set of bets against you that guarantee a loss for you.

DB2. If one can always make a set of bets against you that guarantee a loss for you, then you are irrational.

DB3. \therefore If your beliefs do not conform to the probability calculus, then you are irrational. (DB1, DB2)

DB4. \therefore If you are rational, then your beliefs conform to the probability calculus. (DB3)

A "Dutch book" is a set of bets that guarantee a loss for the bettor.

3.2.3. Objections to Dutch book argument

- DB2 conflates "practical" rationality (adopting the means that will get you what you want) versus "epistemic" rationality (adopting the means that will get you to believe only truths).
- Even if we grant that DB2 is referring to epistemic rationality, it may be the case that: (a) your beliefs violate the probability calculus (so the Dutch book can be run against you), (b) you have no reason to think that your beliefs violate the probability calculus, and (c) you are epistemically rational.
- There is no unique degree of belief one should have: given a set of beliefs b_1, \dots, b_n that violate the probability calculus, one could revise b_1 OR revise $b_2 \dots$ OR revise b_n (or combinations thereof) to get the overall set to conform to the probability calculus. However, this would mean that there are many rational/justified degrees of beliefs that two people can have to the same evidence.
- (Not in P&C): since degrees of beliefs are internal states, subjective probability is not externalist-friendly.

3.3. Other Problems with Probabilism

3.3.1. Tautologies

1. *Simple Probabilism* is true iff a person is justified in believing p iff the probability of p is sufficiently high.
2. $0 \leq \Pr(p) \leq 1$ (axiom of the probability calculus)
3. If p is a tautology (i.e. a logical truth), then $\Pr(p) = 1$. (axiom of the probability calculus).
4. \therefore If Simple Probabilism is true, then a person is always justified in believing logical truths.
5. However, people are not always justified in believing logical truths.
6. \therefore Simple Probabilism is false.

3.3.2. Self-defeat

1. If probabilism is true, then important¹ deductive inference rules are probabilistically valid.
2. An inference rule is *probabilistically valid* iff it follows from the probability calculus that whenever a conclusion can be inferred in accordance with it from a set of premises, the probability of the conclusion is at least as great as the probability of the least probable premise.
3. All important deductive inference rules—including inferences using the axioms of the probability calculus—are probabilistically invalid.
4. ∴ Probabilism is false. (1-3)

¹ P&C cash out importance in terms of “essentially occurring premises” (107). These are premises required to make an inference valid. The formal result is that only deductive inferences with inessentially occurring premises (unimportant ones) are probabilistically valid.