

# Not Enough There There

Evidence, Reasons, and Language Independence

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## The Target

Philosophical views that hold there to be a three-place **evidential favoring relation**.

- A relation between an evidential proposition and two hypothesis propositions.

Some views that believe in such a relation:

- The evidence **confirms** one hypothesis over the other.
- The evidence **justifies** one hypothesis more than the other.
- An agent's total evidence **gives him more reason to believe** one hypothesis than the other.
- The total evidence confers an **objective / logical / evidential probability** on each hypothesis.  
(So the evidence sometimes makes one hypothesis **more probable** than the other.)

## Outline

- 1 The Target
- 2 The Technical Result
- 3 The Trouble with Natural Properties
- 4 Responses and Alternatives

## Languages

We represent evidence and hypotheses as sentences in a language  $\mathcal{L}$  that:

- is a first-order language without variables, quantifiers
- has a finite number of predicates (representing properties) and names (representing objects)
- has a (classical) syntactical consequence relation  $\vdash$

The evidence and hypotheses will be represented by  $e$ ,  $h_1$ , and  $h_2$  in  $\mathcal{L}$ .

### The Relation $f$

$f(h_1, h_2, e)$  just in case the proposition represented by  $e$  favors the proposition represented by  $h_1$  over the proposition represented by  $h_2$ .

Note that  $f$  is a symbol in our **metalanguage**, not in  $\mathcal{L}$ .

## Conditions on Evidential Favoring

We will assume that for any  $e$ ,  $f(\cdot, \cdot, e)$  is antisymmetric.

- That is, if  $f(h_1, h_2, e)$  then it's not the case that  $f(h_2, h_1, e)$ .
- This means  $f$  must represent something like all-things-considered favoring, not *pro tanto* favoring.

It might also be natural to assume that  $f(\cdot, \cdot, e)$  is transitive, but we don't need that for the proof.

We will **not** assume that  $f(\cdot, \cdot, e)$  is total.

- That is, it need not be that either  $f(h_1, h_2, e)$  or  $f(h_2, h_1, e)$ .
- And if neither of those holds, that doesn't mean that  $h_1$  and  $h_2$  are favored **equally** by  $e$ .

## A Substantive Relation

### Substantivity

There exists at least one case in which  $e$ ,  $h_1$ , and  $h_2$  represent logically independent propositions and  $f(h_1, h_2, e)$ .

If substantivity fails, every example of evidential favoring involves some entailment relation between evidence and hypotheses.

Hume taught us that evidential favoring must be substantive.

Example:

$e$ : My current total evidence.

$h_1$ : The sun will rise over the horizon tomorrow morning.

$h_2$ : A Cadillac will rise over the horizon tomorrow morning.

## Conditions on Languages

### Faithfulness

Necessary condition:  $x \vdash y$  just in case the proposition represented by  $x$  entails the proposition represented by  $y$ .

### Adequacy (Rough)

A language that is adequate for two hypotheses and some evidence expresses all the information relevant to any favoring relations between them.

A necessary condition on adequacy:

- If  $\mathcal{L}$  is adequate for  $h_1, h_2, e$  and  $\mathcal{L}'$  expresses every proposition expressible in  $\mathcal{L}$ , then  $\mathcal{L}'$  is adequate for those relata as well.

### Availability of Independent Properties

Given any language  $\mathcal{L}$ , there exists another language whose names refer to all the same objects and whose predicates express all the same properties expressed by the predicates of  $\mathcal{L}$ —as well as one additional property logically independent of those.

## Predicate Permutations

### Identical Treatment of Predicate Permutations

Given  $e, h_1, h_2$  in faithful, adequate  $\mathcal{L}$  and a permutation  $\pi$  of  $\mathcal{L}$ 's predicates,  $f(h_1, h_2, e)$  implies  $f(\pi(h_1), \pi(h_2), \pi(e))$ .

An example: We're sampling sea creatures.

Let  $L$  = has a left fin,  $R$  = has a right fin.

$e$ :  $L_a \ \& \ \sim L_b \ \& \ \sim L_c \ \& \ L_d \ \& \ \sim L_e \ \& \ L_f \ \& \ R_a \ \& \ \sim R_b \ \& \ \sim R_c \ \& \ R_d \ \& \ \sim R_e$

Suppose  $f(Rf, \sim Rf, e)$ .

$e'$ :  $R_a \ \& \ \sim R_b \ \& \ \sim R_c \ \& \ R_d \ \& \ \sim R_e \ \& \ R_f \ \& \ L_a \ \& \ \sim L_b \ \& \ \sim L_c \ \& \ L_d \ \& \ \sim L_e$

If  $f(\cdot, \cdot, \cdot)$  treats predicate permutations identically,  $f(Lf, \sim Lf, e')$ .

## The General Result

### Theorem

*The evidential favoring relation cannot both treat predicate permutations identically and be substantive.*

Since we all agree evidential favoring is substantive, it cannot treat predicate permutations identically.

### Proof.

By aggressive Grue-like maneuvers.

The proof is constructive and works solely with languages whose atomic sentence sets are finite.

## What Our Result Shows

Our general result isn't just about formal *theories* of evidential favoring.

It shows us that if the favoring relation *itself* is substantive, it must **play favorites among properties**.  
(Recall left-finnedness and right-finnedness among sea creatures.)

For example, the favoring relation probably treats greenness differently than it treats grueness.

It takes a **combination** of a preferred property set (or preferred language) and the information in one's total evidence to favor some hypotheses over others. By itself, the informational content of a total evidence set is not enough to yield a substantive evidential favoring relation.

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## Natural Properties

Proposal: The evidential favoring relation is relative to a set of preferred properties called the **natural properties**.

The naturalness of a property is typically taken to be an empirical fact.  
So: How can an agent figure out which are the natural properties?

Paco:

- Has a body of total evidence, wants to draw conclusions.
- Knows he can draw conclusions from evidence only with the list of natural properties.
- Goes looking for the list of natural properties.
- Decides to determine the list of natural properties using his evidence.
- Knows he can draw conclusions from evidence only with the list of natural properties. . . .

## Paco's Predicament Precised

Given hypotheses  $h_1, h_2$  and total evidence  $e$ , we proceed in three steps:

- 1 Use  $e$  to determine a list of natural properties.
- 2 Use that list of natural properties to generate a favoring relation.
- 3 Determine whether  $h_1$  or  $h_2$  is favored by  $e$  on that relation.

If at the end of these three steps, the natural properties list determined using  $e$  yields a favoring relation on which that same  $e$  favors  $h_1$  over  $h_2$ , we will write  $np(h_1, h_2, e)$ .

Problem:  $np(\cdot, \cdot, \cdot)$  satisfies all the conditions we listed earlier for  $f(\cdot, \cdot, \cdot)$ .

So our general result shows that for  $np(\cdot, \cdot, \cdot)$  to be substantive, something **beyond the evidence** has to supply this relation with a list of special properties. But the natural properties were supposed to do that!

## Insufficient Information

Proponents of objective evidential/theoretical reason relations advise an agent to be guided solely by his total evidence in choosing which hypotheses to believe.

Our result tells us that a body of evidence cannot substantively favor one hypothesis over another without the help of an additional element (a preferred language, a list of natural properties, etc.).

That additional element cannot itself be determined by the body of evidence. It needs to be supplied from outside one's evidence—by something else entirely.

A body of propositions does not have enough information content in itself to favor one hypothesis over another.

To paraphrase Getrude Stein, **there's not enough there there**.

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## The Argument So Far (a *reductio*)

- 1 There is a substantive three-place evidential favoring relation. (premise)
- 2 For at least some logically independent hypotheses and evidence, agents can determine that the evidence favors one hypothesis over the other. (premise)
- 3 Agents can determine that evidence favors one logically independent hypothesis over another only if they can determine that particular properties are special (or something equivalent).
- 4 Hypotheses about which properties are special must be determined from empirical evidence and are logically independent of that evidence. (premise)
- 5 So agents can determine that particular properties are special (or something equivalent) only if they can determine that a particular body of empirical evidence favors one logically independent hypothesis over another.
- 6 Because of the circularity in (3) and (5), such a determination cannot be made.
- 7 So there are no cases in which a body of evidence favors one logically independent hypothesis over another and agents can determine this fact. **This contradicts (2) above.**

## *a priori* Special Properties

This would require a very strong conception of the *a priori*. Some points:

- ① Need not just a *a priori* warrant for a Regularity Principle—need a *a priori* knowledge of **which** properties are projectible.
- ② Our result shows that this can't be determined in some subtle, highly general way from our evidence.
- ③ Need not only a mechanism by which this can work, but also why that method carries epistemic weight.
- ④ The only available metaphysical story of what the “specialness” consists in makes the special properties list contingent and empirical.
- ⑤ “Disjunctive” predicates aren't always intuitively rejected. (e.g. “at home”, Aristotelian physics, snakes & legs before the Fall)
- ⑥ “Grue” isn't actually disjunctive: The property it expresses is just a set of objects like any other. It's the **translation** from English to Grueish that is disjunctive.
- ⑦ Discounting “grue” isn't sufficient. Like telling Gödel we weren't that interested in proving the Gödel sentence anyway.

## Subjectivism

Proposal: Drop the idea of an **objective** evidential relation between hypotheses and evidence ( $h_1, h_2, e$ ) and consider evidential favoring relative to a fourth, **subjective** relatum.

That is, relativize the evidential favoring relation to a list of properties determined by features of agents—features to which those agents have access.

The agential contributions may be subject to internal consistency constraints (constraints of *rationality*), both synchronic and diachronic.

Subjectivism denies Feldman and White's **Uniqueness Thesis**.

- Two agents with the same total evidence may be rationally **permitted** to have different beliefs.
- Two agents with the same total evidence might even be rationally **required** to have different beliefs.

## Hard Externalism

Proposal: There are objective evidential support facts, but agents are not able in general to access them.

- This view denies that reasons facts are necessary.
- The most extreme externalism I've heard so far. Doesn't just deny that we know what our evidence is; also denies that we know what our evidence supports.
- Bootstrapping. (Vogelian)
- Anachronism problem: Anaximenes claimed that evidence involving condensation favored his theory that material things are made of air over Thales's theory that they are made of water. Did Thales and Anaximenes have access to the considerations that determine whether Anaximenes was right?

## A Different View of Science

Carnap understood scientific reasoning as an argument like “arguments” in deductive logic:

- From a set of premises to a conclusion.

Instead, see science as an “argument” in the vernacular sense:

- An activity that carries on through time, over the course of which positions change, evidence is introduced, and new views develop.

Our evidence doesn't tell us where we should **be**.

Each piece of evidence as it accumulates tells us, given where we are **now**, where we should go **next**.

## Another Version of This Approach

Subjective Bayesianism is a subjectivist view in our sense.

It obtains an evidential favoring relation by supplementing total evidence with a **prior**, an agential contribution not determined by the evidence.

I don't think it's a coincidence that Bayesian philosophers of science have almost unanimously shifted from Objective to Subjective Bayesianism.

But what convinced us?

And what exactly is our **argument** against the possibility of Objective Bayesianism?

*"A key has no logic to its shape. Its logic is: it turns the lock."*

– G. K. Chesterton

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## Bonus slide: Reference Magnetism

Proposal: Predicates in our language automatically refer to natural properties, so we may project the properties represented by our predicates.

Consider a chemist in the late 18th century, just after Lavoisier introduces "oxygen" as part of a theory of heat meant to displace a theory that makes heavy use of "phlogiston."

How does this chemist decide which predicate refers to a natural property?

Lewis suggests that natural properties are referred to by the predicates that play a role in our currently best-confirmed scientific theories.

But we can't know which theories are best confirmed until we know what our evidence supports, and we can't know that until we know which of our predicates represent natural properties. . . .

(Note that Lewis never explains how to use natural properties and reference magnetism to do epistemology—perhaps for good reason!)

## Bonus slide: Virtuous Circles and "Cyclophobia"

Proposal: We begin with ideas both about which are the natural properties and what evidence supports what hypotheses. By bringing these into harmony through a reflective equilibrium process, we can come to understand evidential favoring.

Question: Does this process yield the same (true) favoring relation regardless which inputs we start with?

If not, we have a subjectivist view.

If so, the process must have a tendency to treat some properties differently than others which is antecedent to its application to our particular list, proposed relation, and/or evidence.