# Optimism about the Pessimistic Induction

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***Based on***

"Optimism about the Pessimistic Induction," *New Waves in Philosophy of Science*. Palgrave-McMillan, forthcoming.

***For other crushing defeats of this and other anti-realist positions see*:**

"Inconceivable Support Relations," *a generalization and strengthening of Tracking Truth* (2005), Ch. 6, with new implications, e.g.:

You can't step in the same evidence twice.

# Plan for the day

*Thesis*: Pessimistic inductions over the history of science have failed against modest realism.

1. The pessimistic induction must be a meta-induction.

2. I.e., the pessimist must tell us why our predecessors' fallibility or unreliability is a reason to believe in ours.

3. The pessimist needs some explanation why believing *we* are fallible has implications for our first order beliefs. I help him out.

4. Pessimist's induction from predecessors to ourselves can be undermined by comparisons of method over time. (cross induction)

Treats: definition of fallibility, disappearance of preface paradox

# Who is the modest realist?

-- She apportions her belief in particular theories to the evidence for them or their parts, e.g., particular experiments.

-- She does not make claims about why she has a right to do this, or claims about success indicating truth, IBE, etc.

-- She does not need to have an argument showing that she is justified apportioning her belief to the evidence in order to *be* justified in doing this.

-- Rationality does obligate her to listen if someone challenges her about whether she is justified in apportioning her belief to the evidence.

-- I will call her the “optimist.”

# The Pessimist needs an Induction

1. He needs an argument, not merely counterexamples.
2. Induction requires a similarity base:

All swans I’ve seen are white.

---

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    All swans I've seen are white.

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    All swans are white.

This wouldn't work if we changed the conclusion to:

    All bananas are white.

    All paper towels are white.

# First-order similarities?

Was our predecessors' *evidence* similar to ours in content?

Either supportive, counter-evidence, or irrelevant to our theories.

→ At worst our theory is false because of particular counter-evidence, not because of an induction over the history of science.

Were their *theories* similar to ours in content?

If false, then ours are false, but that's not an induction.

If true, then not pessimism.

Past scientists believed A and were wrong.

Past scientists believed B and were wrong.

Past scientists believed C and were wrong.

You believe D?  What, are you stupid?

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Past scientists believed B and were wrong.
Past scientists believed C and were wrong.

You believe D?  What, are you stupid?

We *justifiably* believe D.

Past scientists justifiably believed A and were wrong.

Past scientists justifiably believed B and were wrong.

Past scientists justifiably believed C and were wrong.

You justifiably (?) believe D? What, are you stupid?

# What is a pessimist to do? (p)review

Particular theories and evidence from the history of science do not have the same or relevantly similar *content* to ours.

Pessimist needs a general 2nd-order property to get a similarity of us to our predecessors (basis of an induction).

Later: how exactly will general, 2nd-order properties of beliefs and theories impact optimist's reason to believe in, say, *Quantum Mechanics*? Why are properties of beliefs relevant to properties of electrons?

# Pessimist *must* use meta-induction

The pessimist needs properties *concerning*, e.g., beliefs, evidence, justifiedness, reliability, fallibility, theories in general

# Second-Order Similarity

They had (good) ***evidence*** (***justification***) for their theories, and the theories were ***not true***.

We have (at most good) ***evidence*** (***justification***) for our theories, so …

# First General Property

For many theories T that were ***believed justifiably*** by **those** human beings doing science, T is ***false***.

If the induction goes through, then our conclusion will be:

For many theories T ***justifiably believed*** by **these** human beings doing science, T is ***false***.

Different theories, different evidence, but same property:

Justifiably believed T *but* T false

# Induction 101

Induction is ***erodable*** (non-monotonic, defeasible): further information can render the inference illegitimate.

Jumping man reaches 40$^{th}$ floor:

"So far, so good."

# Induction 101

Induction is erodable. Further information can render the inference illegitimate.

Jumping man reaches $40^{th}$ floor:

"So far, so good."

The number of floors in a building is finite.

# Induction 101

All F I’ve seen are G.

==========

All F are G.

All F I’ve seen are G

(Remaining) F have **property P**, **relevant** to whether they have G.

========== X

All F are G.

# Applied Induction 101

Let F = people **believing a theory with evidence**, G = theory **false** (or low prob.)

All F I've seen are G.
==========
All F are G.

Let P = different theory, different evidence

All F I've seen are G
Remaining F have property P, relevant to whether they have G.
========== X
All F are G.

*Trick*?

# Pessimist's Best Possible Argument

Let F = people **believing theories with evidence**, G = **unreliable**

All F I've seen are G.
==========
All F are G.

Let P = tell you later

All F I've seen are G
Remaining F have property P, relevant to whether they have G.
========== X
All F are G.

# Pessimist needs:

(Letting F = justifiably believes, G = unreliable)

their unreliability → our being unreliable

↓

withdrawal of confidence in QM.

Now: were we to show we're unreliable, what would follow from that?

# Preface Paradox

Subject has evidence and so believes justifiably and confidently each of

$p_1, p_2, p_3, \ldots p_{10,000}$.

"That is," $\mathbf{P}(p_1) = 1$ and $\mathbf{P}(p_2) = 1$ and … and $\mathbf{P}(p_{10,000}) = 1$

Subject believes at least one of $p_1, \ldots, p_{10,000}$ is probably wrong.

That is, $\mathbf{P}(-p_1 \vee -p_2 \vee -p_3 \vee \ldots \vee -p_{10,000}) =$ very high

But, $(-p_1 \vee -p_2 \vee -p_3 \vee \ldots \vee -p_{10,000})$

iff $-(p_1 \wedge p_2 \wedge p_3 \wedge \ldots \wedge p_{10,000})$

# Fallibility – Preface Paradox

$\mathbf{P}(p_1)$, $\mathbf{P}(p_2)$, $\mathbf{P}(p_3)$, … $\mathbf{P}(p_{10,000})$ each very high

$\leftrightarrow$

$\mathbf{P}(p_1 \wedge p_2 \wedge p_3 \wedge \ldots \wedge p_{10,000})$ very low

$\leftrightarrow$

$\mathbf{P}(\neg p_1 \vee \neg p_2 \vee \neg p_3 \vee \ldots \vee \neg p_{10,000})$ very high

# Fallibility

There our beliefs were responsive to our possibility of error via withholding of full confidence, but this was not ascribing to ourselves the property of fallibility, a property which applies to beliefs.

*Reliable* to degree x: $PR(q/B(q)) = x$

*Fallible* to degree y: $1 - PR(q/B(q)) = y$

E.g., I'm very confident I am 40% fallible (60% reliable):

$$P(PR(q/B(q)) = .6) = \text{high}$$

**KEY**: This does not at all constrain:

$$P(q)$$

# Fallibility

There our beliefs were responsive to our possibility of error via withholding of full confidence, but this was not *ascribing to ourselves* the property of fallibility, a property which applies to beliefs.

*Reliable* to degree x: PR(q/B(q)) = x

*Fallible* to degree y: 1 – PR(q/B(q)) = y

I'm very confident I am 40% fallible:

**P**(PR(q/**P**(q) = .9) = .6) = high

This does not constrain: **P**(q)

*You might think it's obvious that it does.*

# The Pessimist's Evil Twin

Creationist: you haven't *proved* the theory of evolution. It might be wrong!

Therefore, we should teach another theory because it is equally good.

From mere fallibility – possibility of error – we have an apparent shattering, in which every theory is equally creditworthy.

We want an answer to why fallibility/unreliability *is* relevant to first-order belief but avoids this ugly consequence.

# Why Descent?
# Calibration

Because it's good to be calibrated:

Confidence = Reliability

Degree of belief in q = reliability in q-like matters.

→ *If* the pessimist gives us reason to believe we are unreliable in q-like matters, then we should dial down our confidence in q. (Quantity matters.)

Subject is ***calibrated*** iff

$$P(q) = PR(q/B(q))$$ (simplified)

confidence matches reliability.

*New rule of conditionalization:*

$$P_f(q) = P_i(q/P_i(q) = x \,.\, PR(q/P_i(q) = x) = y) = y$$

*Advertisement*

"Second Guessing: A Self-Help Manual," *Episteme* (in press)

*Coming soon*

"The Re-Calibrating Bayesian," manuscript

# So far so good for the Pessimist

Now he has to show us why the unreliability of our predecessors gives us reason to think that we are unreliable.

But there is a cross-induction. We use more and ***different methods***. (This is property P.)

To undermine the pessimistic induction, we do not need to show that our methods are better, only **1)** that they are different and **2)** differences in method are relevant to reliability (getting true theories).

# Comparisons

Straight rule vs. Straight rule plus cross-induction

Straight rule plus cross-induction vs. Bayesianism

**Key**:

Next method catches some mistakes the previous doesn't, while still catching the mistakes the first does.

Way of showing a priori that method is relevant to reliability.

(This is a recipe. Optimist needs to identify "new" method aspect used for her theory -- compared to those used for failed theories -- in order to fend off the pessimist.)

# Unconceived Conceivables

F = People were subject to unconceived conceivables.

G = People were unreliable, mostly wrong.

P = Remaining cases (we) use different methods, methods relevant to how reliable one is when faced with a possibility space of alternate theories. We can rule out alternatives without conceiving them. We can rule out alternatives faster.

All previous F were G.

P

========== X

All F (including us) are G.

# Our Predecessors – a new similarity

They could also break the induction from their predecessors to them: they used different methods from their predecessors.

Yes, and that's why we think of them as in some sense justified.

We're similar to them in being able to make this induction, and they were wrong!

We're similar to them in this, but also relevantly different: we use different methods. The pessimistic induction is broken. The jury is out, and that's all we need.

# Another Pessimistic Induction?

Our predecessors had different methods from their predecessors and so escaped the obligation to give up confidence in their theories. But isn't there a new induction:

Again and again, a spiffier method wasn't in fact good enough to get a true theory, so *method is not relevant to reliability*.

Reply:

1. We show non-inductively (case by case) that *which* method you use is relevant to how reliable you are.

2. The question whether any method at all makes any difference at all to whether you get the truth is just the problem of induction. X

3. Also self-refuting. (Why not use anti – deduction?)

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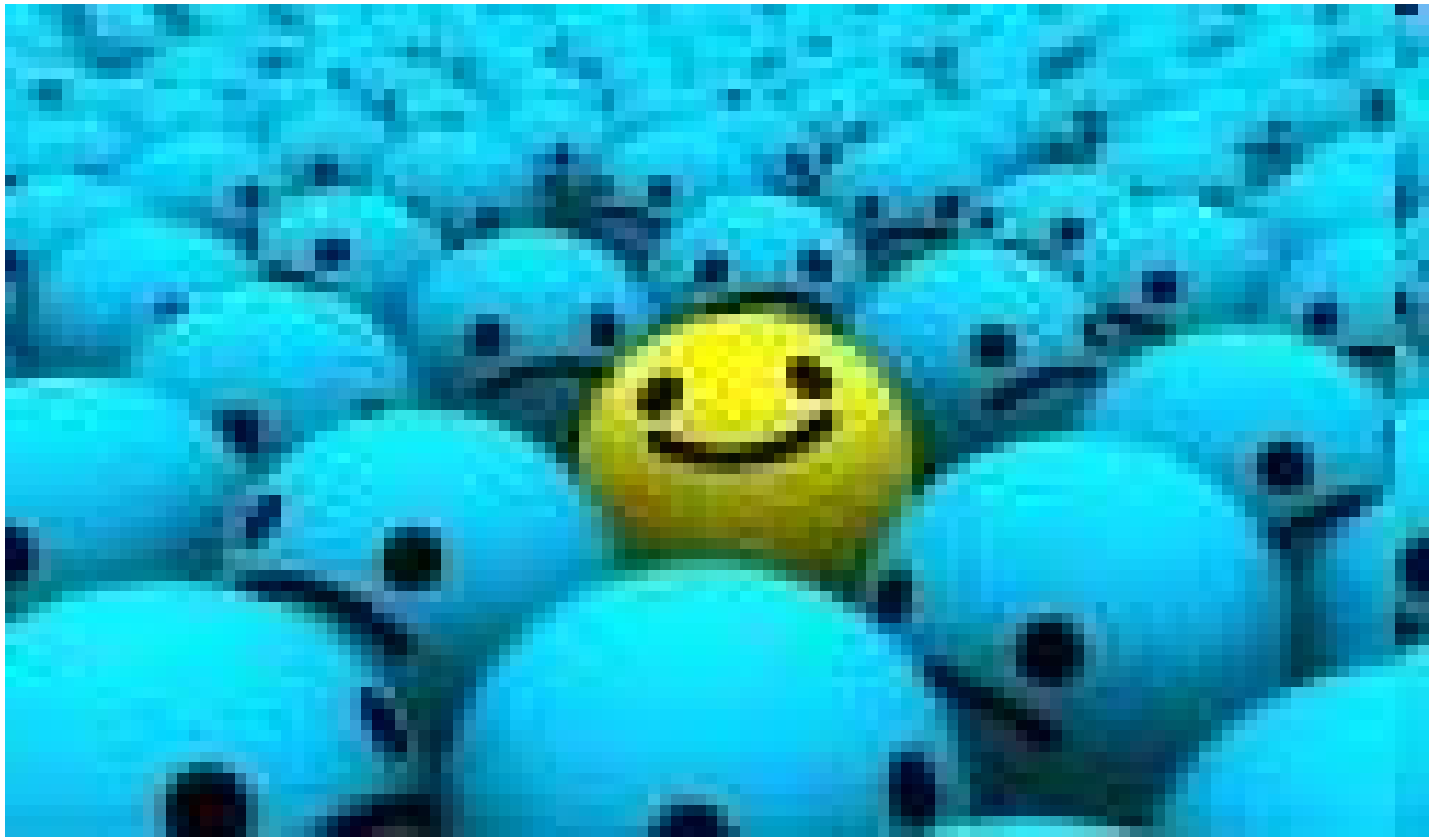


DON'T WORRY, BE HAPPY