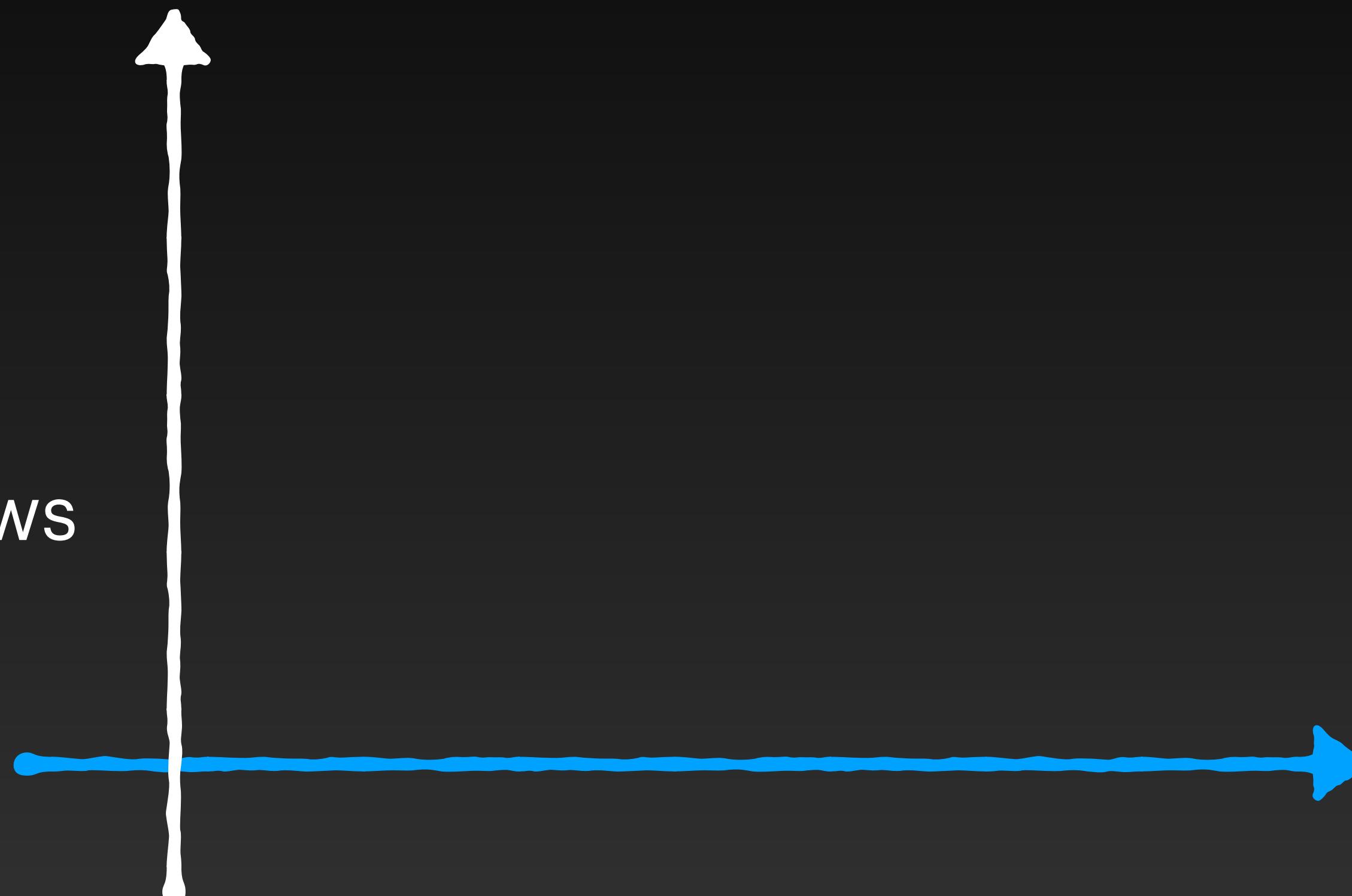


# Can Humeans be Scientific Realists?

Bell Bixin Guo, [big15@pitt.edu](mailto:big15@pitt.edu)  
University of Pittsburgh, HPS

# Introduction

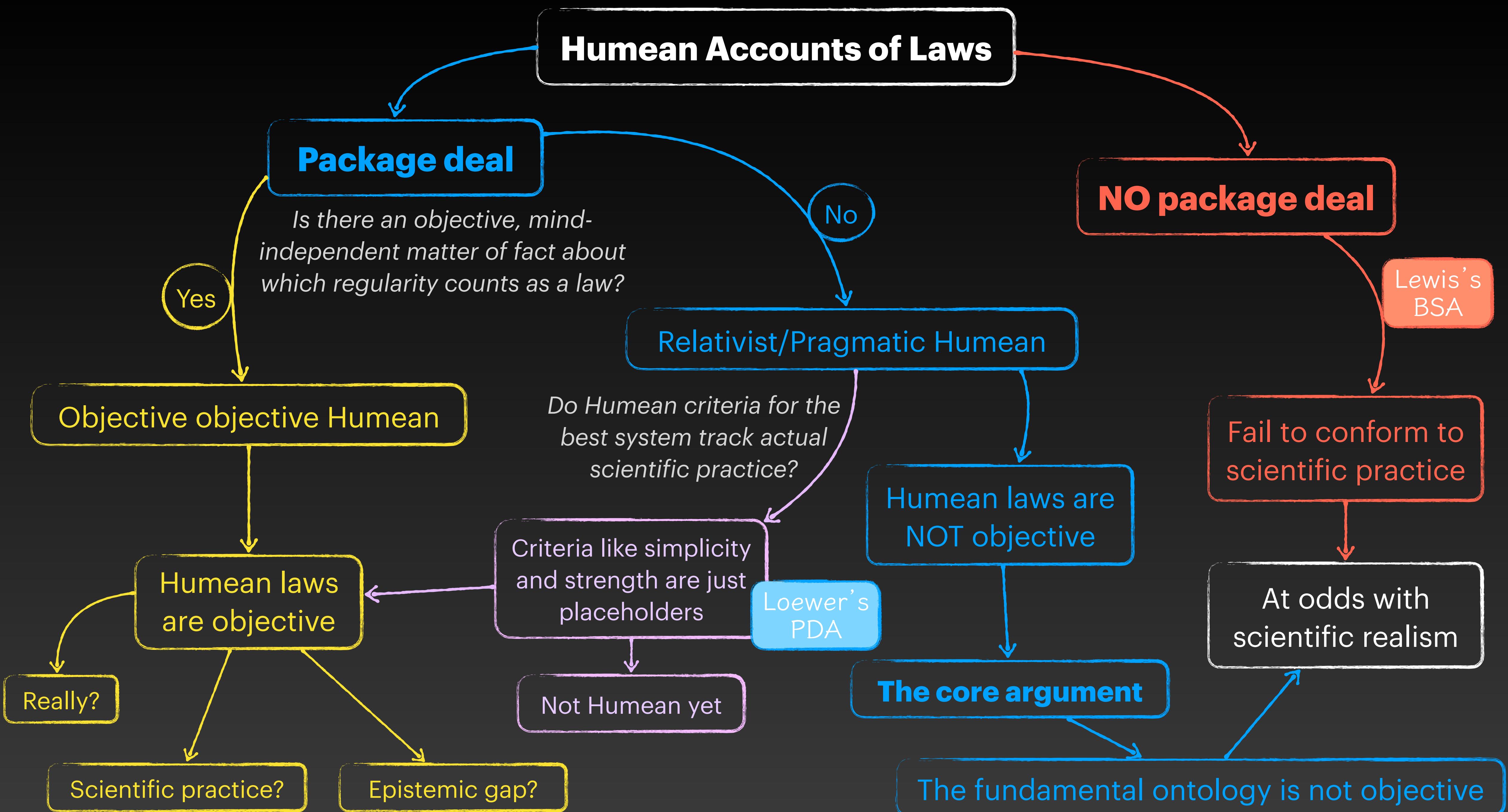
Humean accounts of laws



Scientific Realism

# Thesis

- Humean accounts of laws are at odds with scientific realism.



# Motivations and Implications

- Consistency

# Motivations and Implications

- Consistency
- Why and in what sense objectivity of laws matters

# Motivations and Implications

- Consistency
- Why and in what sense objectivity of laws matters
- 



# Best System Account of Laws

## Lewis's version

- (I) A metaphysical thesis: laws supervene on, and are reducible to, categorical properties.

Humean

- *What makes something a law is the fact that it belongs to a system that best satisfies certain criteria*

- (II) A guiding principle of identifying laws from non-lawful claims that specifies what the criteria for the best system are: simplicity, strength, and their balance.

# Scientific Realism

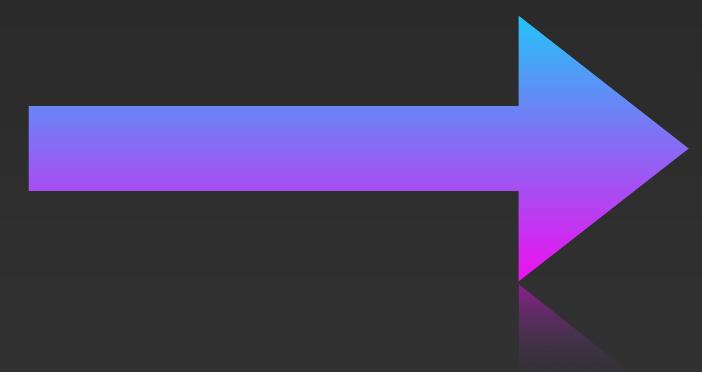
- Scientific realism requires science be taken at “face value” (Putnam 1978, 37) as informing us about what the world is really like.
- Our best scientific theories are (at least approximately) true & the theoretical terms employed in those theories refer to real objects, including unobservable ones, that exist in the world independent of the human mind.

# Scientific Realism

- Scientific realism requires science be taken at “face value” (Putnam 1978, 37) as informing us about what the world is really like.
- Our best scientific **theories** are (at least approximately) true & Scientific **objects** really exist in the world independent of the human mind

# Scientific Realism

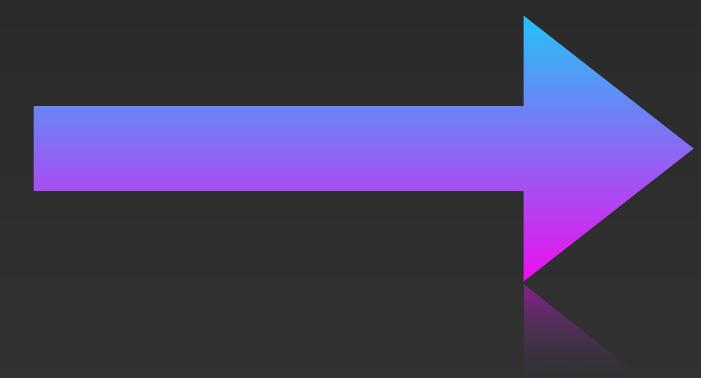
- Scientific realism requires science be taken at “face value” (Putnam 1978, 37) as informing us about what the world is really like.
- Our best scientific **theories** are (at least approximately) true & Scientific **objects** really exist in the world independent of the human mind



**Realism about Laws**

# Scientific Realism

- Scientific realism requires science be taken at “face value” (Putnam 1978, 37) as informing us about what the world is really like.
- Our best scientific **theories** are (at least approximately) true & Scientific **objects** really exist in the world independent of the human mind

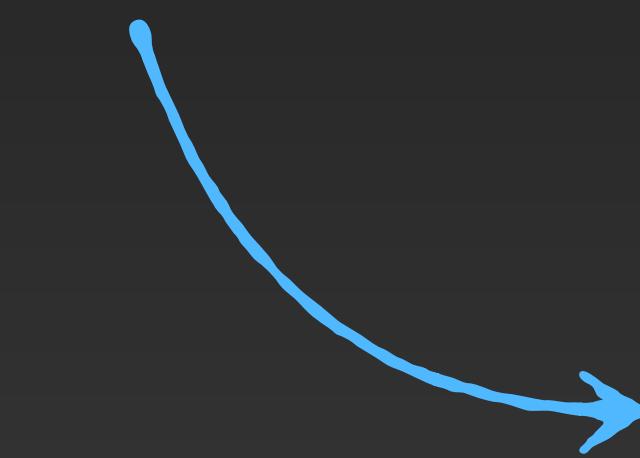


## Realism about Laws (?)

Laws succeed in describing some aspects of reality, or there are laws of nature in the world.

# Realism about Laws

- (1) The propositions that are laws in our best scientific theories are at least approximately true.
- (2) There is an objective, mind-independent matter of fact about which regularity or generalization counts as a law and which doesn't.
- (3) Laws are **irreducible** to categorical properties of material objects or any non-modal facts.



**non-Humean**

# Realism about Laws

- (1) The propositions that are laws in our best scientific theories are (at least approximately) true.
- (2) There is an objective, mind-independent matter of fact about which regularity or generalization counts as a law and which doesn't.
- (3) Laws of nature are irreducible to categorical properties of material objects or any non-modal facts.

# Realism about Laws

- (1) The propositions that are laws in our best scientific theories are (at least approximately) true.
- (2) There is an **objective, mind-independent** matter of fact about **which regularity or generalization counts as a law** and which doesn't.
- (3) Laws of nature are irreducible to categorical properties of material objects or any non-modal facts.

# Realism about Laws

(2) There is an **objective, mind-independent** matter of fact about **which regularity or generalization counts as a law** and which doesn't.

- ▶ *Objective objective Humeans*: YES, the distinction between laws and mere regularities is grounded in the world;
- ▶ *Relativist/Pragmatic Humeans*: NO, the distinction is grounded in us.

# Realism about Laws

(2) There is an **objective, mind-independent** matter of fact about **which regularity or generalization counts as a law** and which doesn't.

- ▶ *Objective objective Humeans*: YES, the distinction between laws and mere regularities is grounded in the world;
- ▶ *Relativist/Pragmatic Humeans*: NO, the distinction is grounded in us.

# Realism about Laws

- (1) The propositions that are laws in our best scientific theories are at least approximately true.
- (2) There is an objective, mind-independent matter of fact about which regularity or generalization counts as a law and which doesn't.
- (3) Laws of nature are irreducible to categorical properties of material objects or any non-modal facts.

Scientific Realism



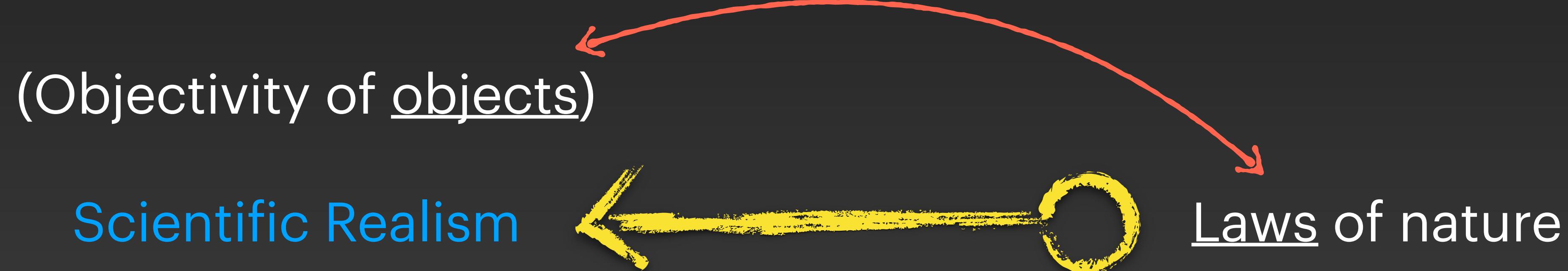
Laws of nature

Scientific Realism

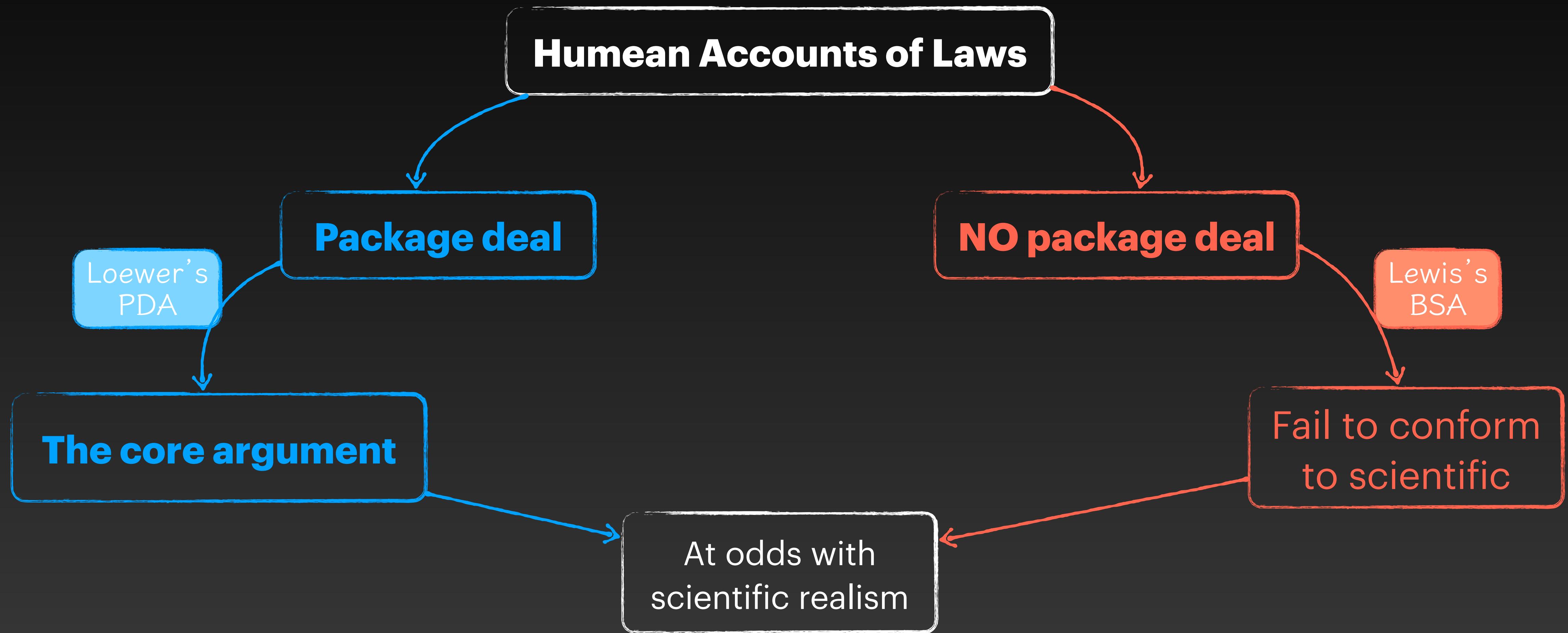


Laws of nature

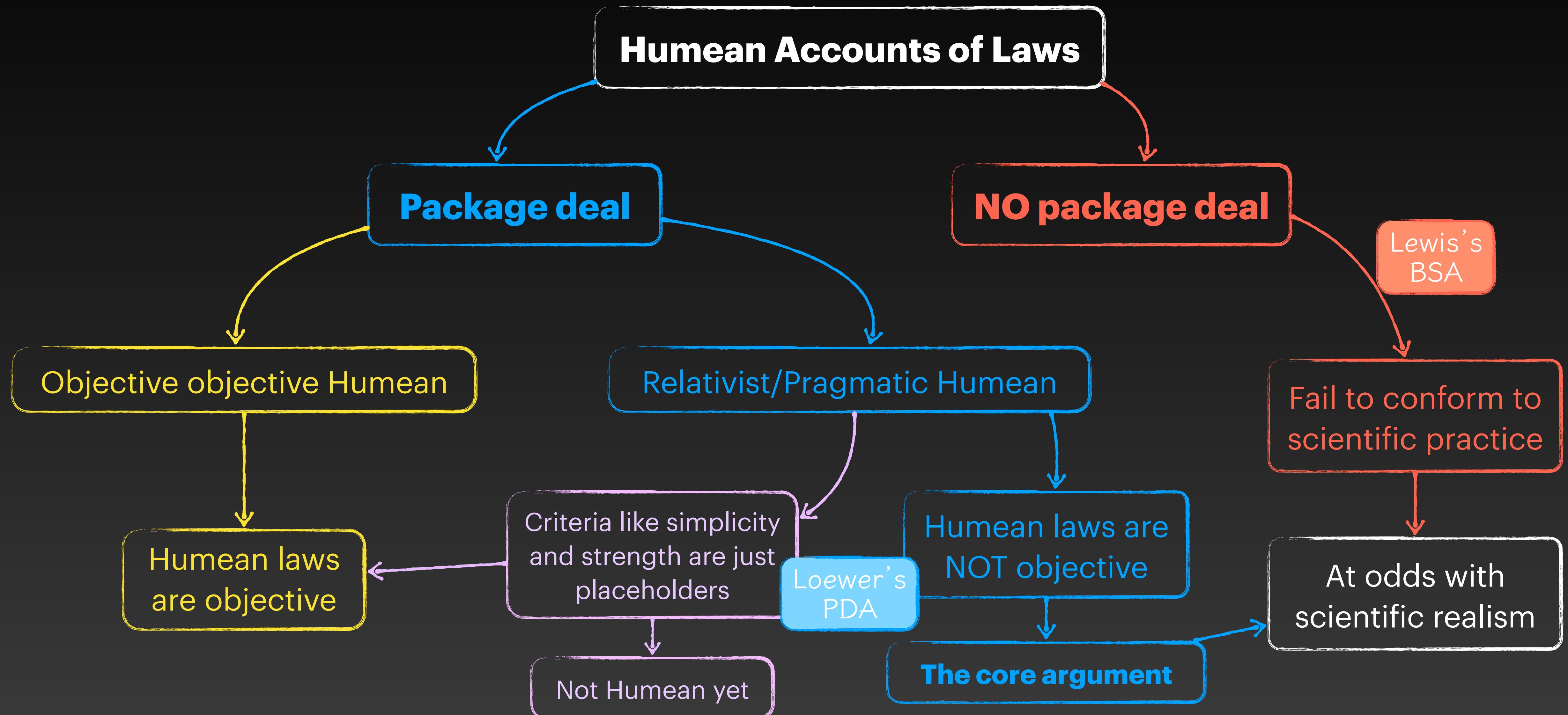
- *Objectivity Objection*: Humean laws are not objective.



# Thesis



# Outline



# Package deal

- Example: Loewer's Package Deal Account (PDA)
  - the fundamental ontology of the world (with its categorical properties) and laws of nature are specified together as a “package deal” and are metaphysically on a par
  - explicitly commits to relativism  
*(best relative to us)*

Relativist/Pragmatic Humean

The core argument

# The core argument

- (P1) Scientific realism takes the fundamental ontology of physics to be *objective*.
  - (P2) If the fundamental laws are *not objective* according to the PDA, then the fundamental ontology is *not objective*.
  - (P3) The fundamental laws are *not objective* according to the PDA.
- 
- (C) The PDA contradicts scientific realism.

# The core argument

(P1) Scientific realism takes the fundamental ontology of physics to be *objective*.

## **Scientific Realism**

Objective: mind-independent

It is not relative to us  
what the fundamental ontology is  
or whether it exists.

# The core argument

(P1) Scientific realism takes the fundamental ontology of physics to be *objective*.

(P2) If the fundamental laws are *not objective* according to the PDA, then the fundamental ontology is *not objective*.

- The PDA takes the fundamental ontology and laws both as elements of a package that are metaphysically on a par;
- they share the same metaphysical status:

Either both of them are objective, or neither of them is.

# The core argument

(P3) The fundamental laws are *not objective* according to the PDA.

Relativist and/or pragmatic Humean accounts:  
what makes a regularity a law comes from us

# The core argument

(P3) The fundamental laws are *not objective* according to the PDA.

Relativist and/or pragmatic Humean accounts:

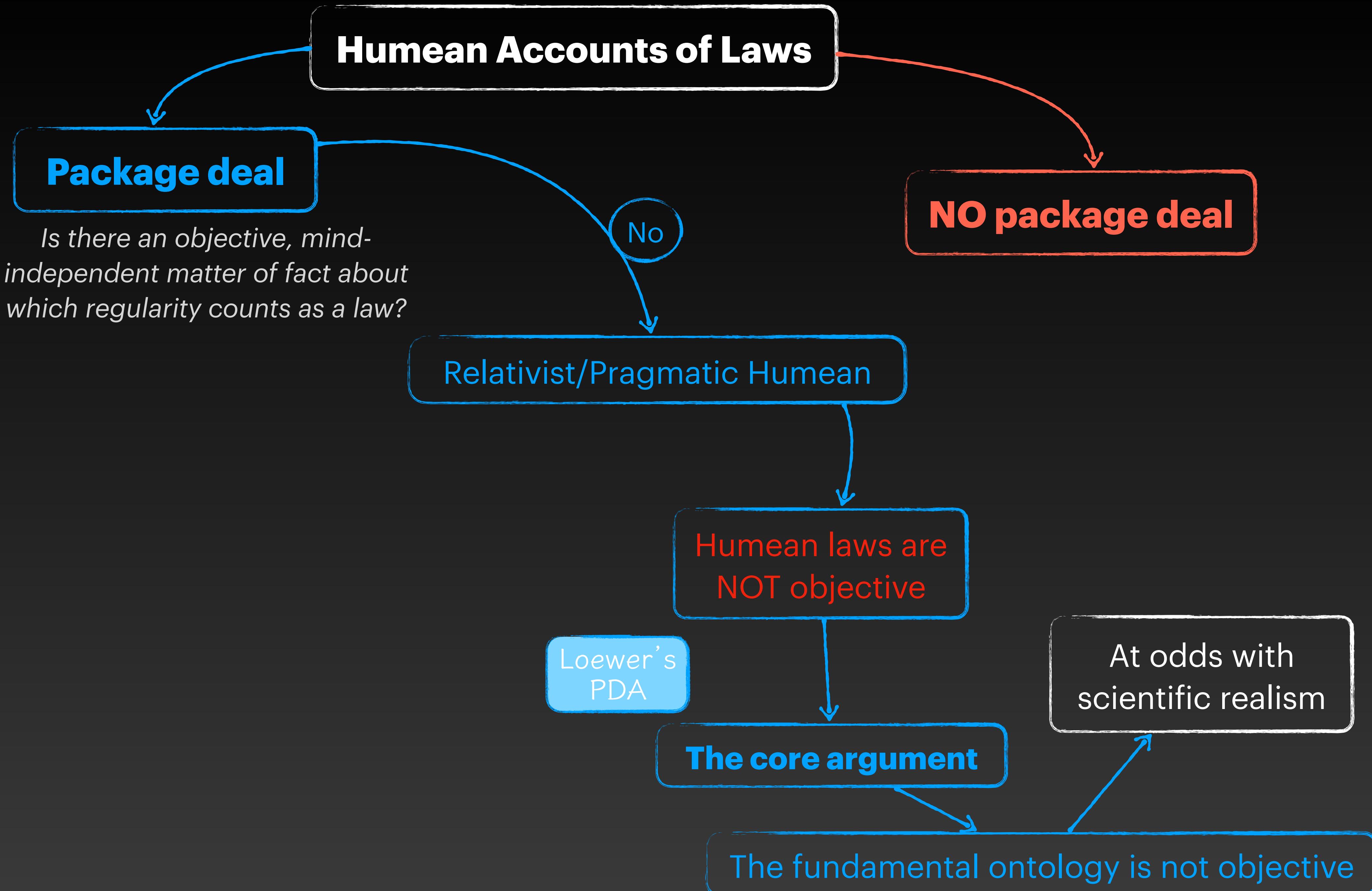
laws are distinct from mere regularities and targets for scientific inquiry because they are useful *for us*

—they make “the world understandable to us”, are convenient to use, suit our pragmatic purposes, and/or are a natural result of the limitations of our cognitive capacities.

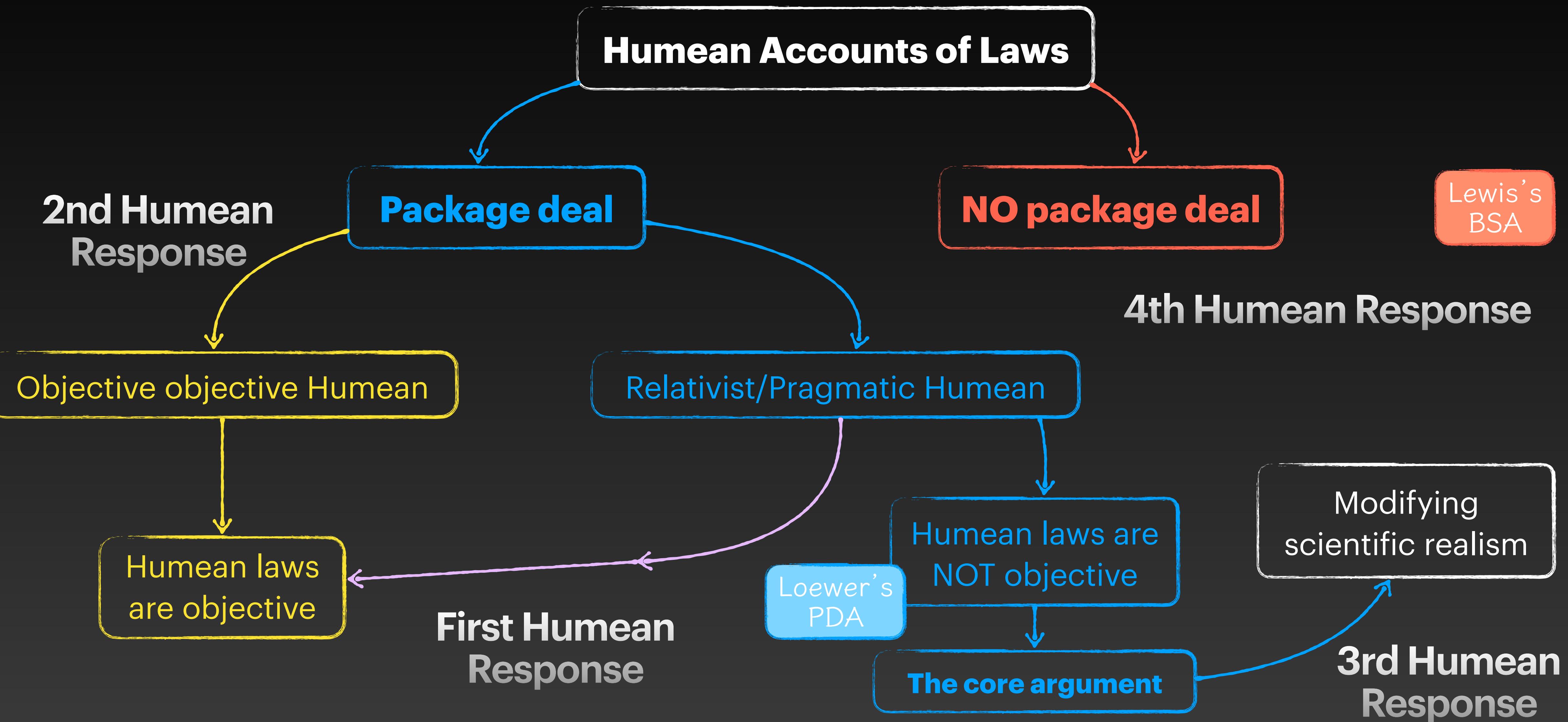
# The core argument

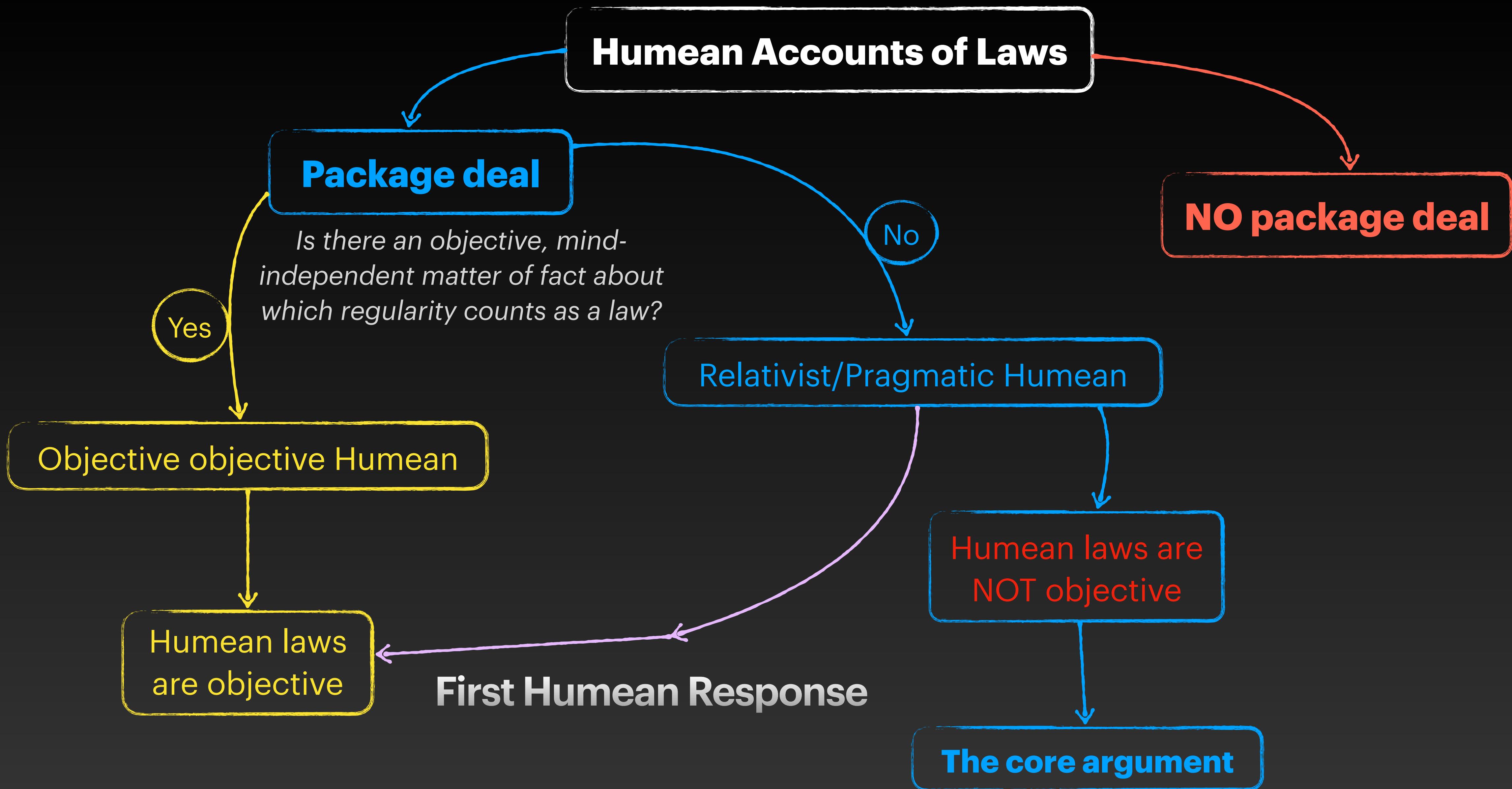
(P3) The fundamental laws are *not objective* according to the PDA.

Scientific Realism	The PDA
Objective: mind-independent	“relatively objective”
It is NOT relative to us what makes something the fundamental ontology; we care about it because it really exists in the world.	It is relative to us what makes something a law; we care about laws because they are useful for us.



# Outline





# First Humean Response

- Humean laws are as objective as science and are not mind-dependent in any problematic way that compromises scientific realism.
  - A clear winner for the best system

# First Humean Response

- Humean laws are as objective as science and are not mind-dependent in any problematic way that compromises scientific realism.
  - A clear winner, if nature is kind

# First Humean Response

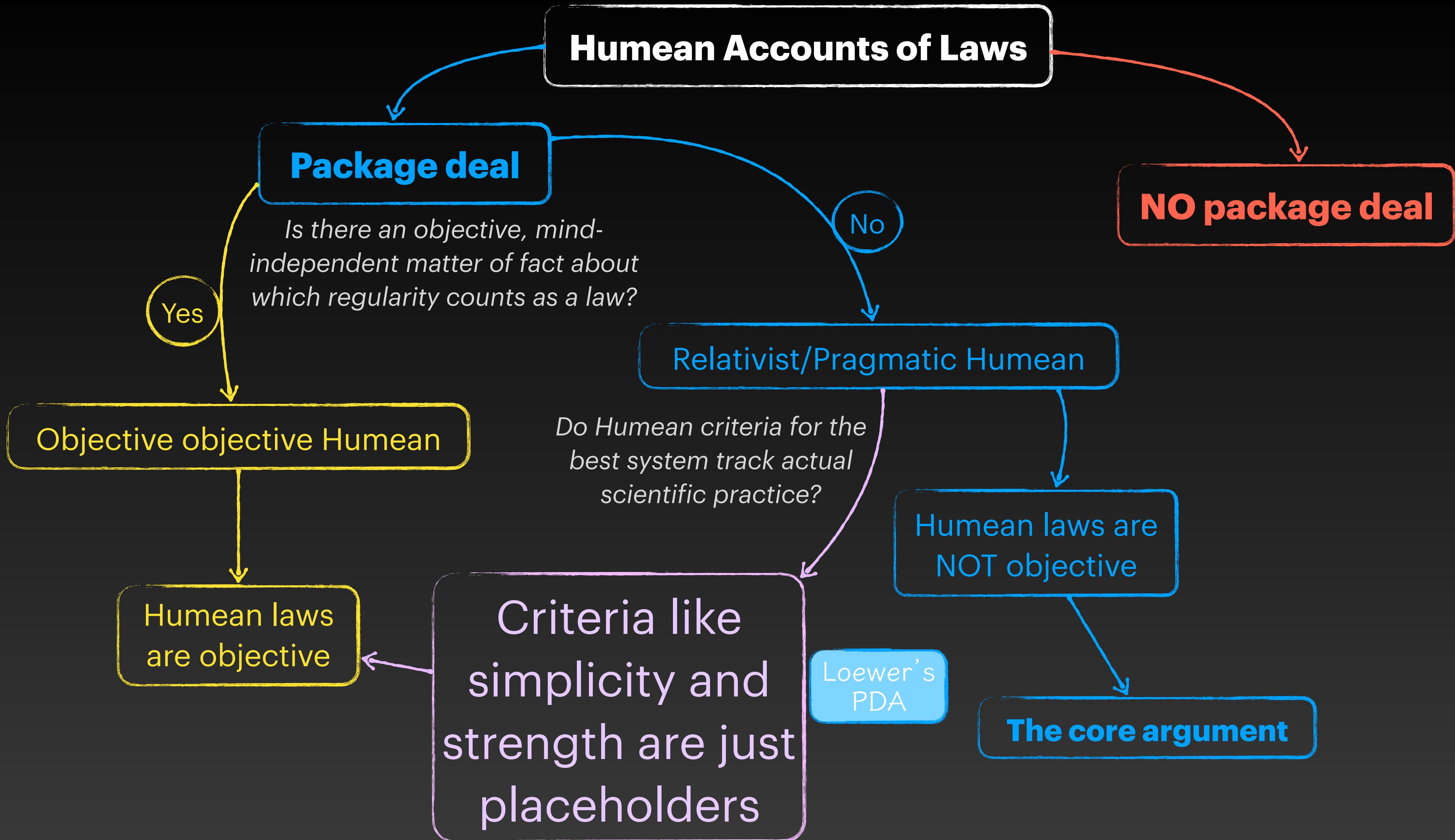
- Humean laws are **as objective as science** and are not mind-dependent in any problematic way that compromises scientific realism.
  - A clear winner, if nature is kind
  - The fact that our science succeeds at telling us what the world is (including what laws are) is evidence that nature is kind to us such that our epistemic criteria successfully lead to the objective structure of the natural world

# First Humean Response

- Humean laws are as objective as science and are not mind-dependent in any problematic way that compromises scientific realism.
- Implicit Assumption: Humean accounts align with scientific practice so that their best system is exactly what science delivers.

# First Humean Response

- Humean laws are as objective as science and are not mind-dependent in any problematic way that compromises scientific realism.
- Implicit Assumption: Humean accounts align with scientific practice so that their best system is exactly what science delivers
  - arguably not the case (e.g., van Fraassen 1989; Woodward 2014).



# First Humean Response

## Humean Accounts of Laws

- (I) A metaphysical thesis: laws supervene on, and are reducible to, categorical properties.
- (II) A guiding principle of identifying laws from non-lawful claims that specifies what the criteria for the best system are: simplicity, strength, and their balance.



# First Humean Response

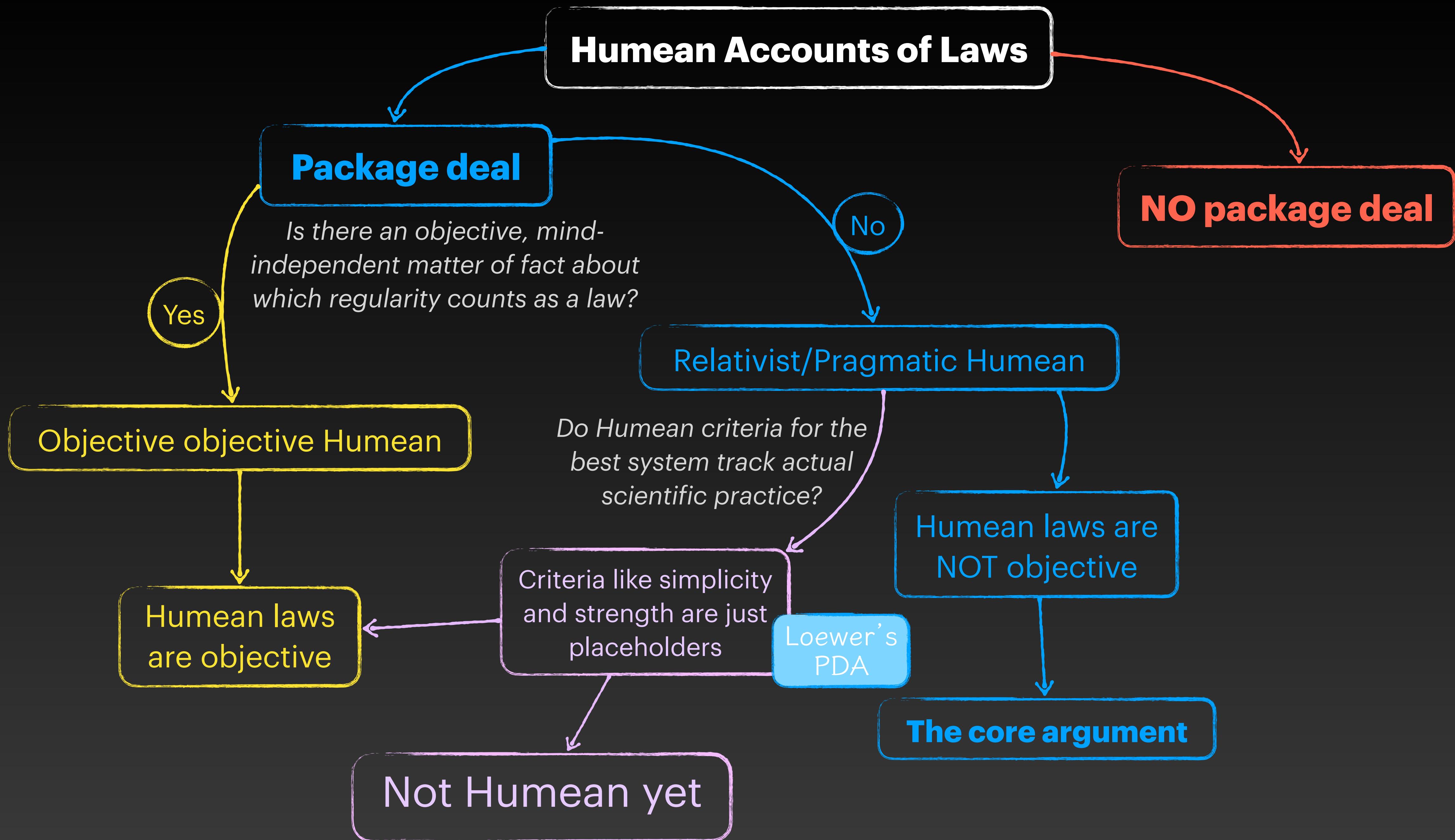
## Humean Accounts of Laws

- (I) A metaphysical thesis: laws supervene on, and are reducible to, categorical properties.
- (II) A guiding principle of identifying laws from non-lawful claims that specifies what the criteria for the best system are: simplicity, strength, and their balance.

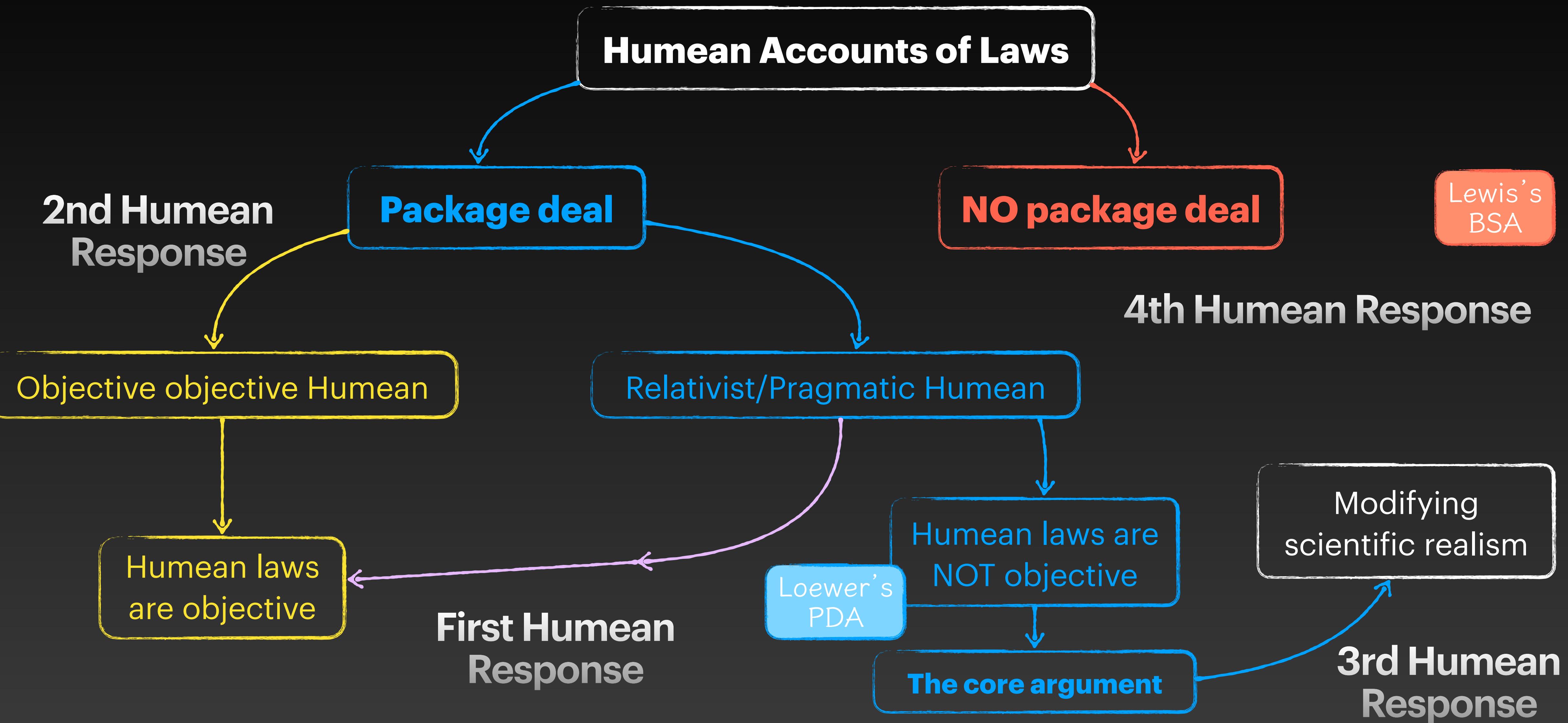
# First Humean Response

## Humean Accounts of Laws

- 
- 
- (I) A metaphysical thesis: laws supervene on, and are reducible to, categorical properties.
  - (II) A guiding principle of identifying laws from non-lawful claims that specifies what the criteria for the best system are: simplicity, strength, and their balance.
- the standards are whatever used in science



# Outline



## Humean Accounts of Laws

### Package deal

*Is there an objective, mind-independent matter of fact about which regularity counts as a law?*

Yes

Objective objective Humean

Humean laws  
are objective

No

### NO package deal

Relativist/Pragmatic Humean

### The core argument

The criteria for the best system—simplicity, strength and their balance—are in fact objective in the sense that mathematical or computational concepts are objective

## Humean Accounts of Laws

### Package deal

*Is there an objective, mind-independent matter of fact about which regularity counts as a law?*

Yes

Objective objective Humean

Humean laws  
are objective

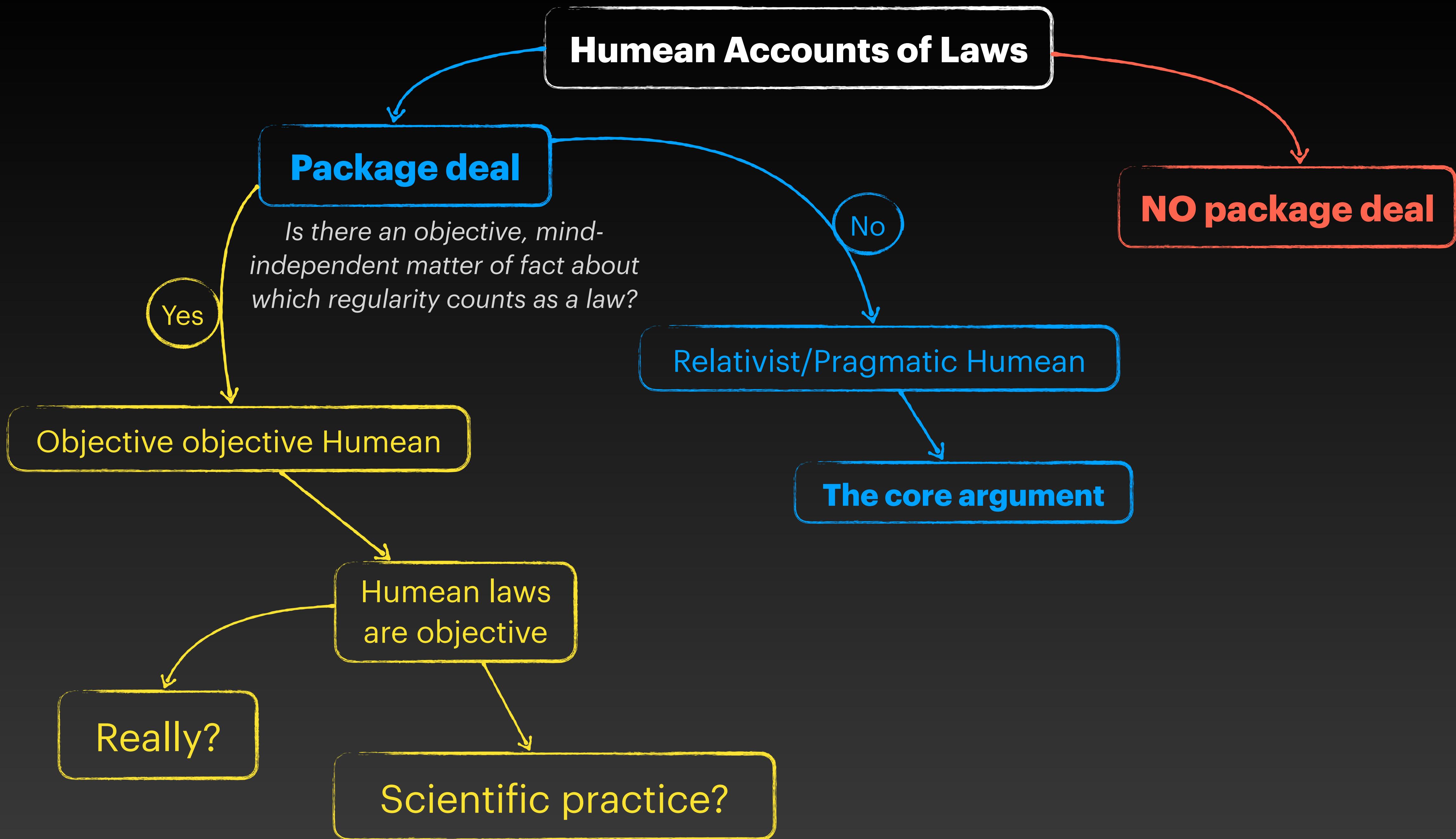
Really?

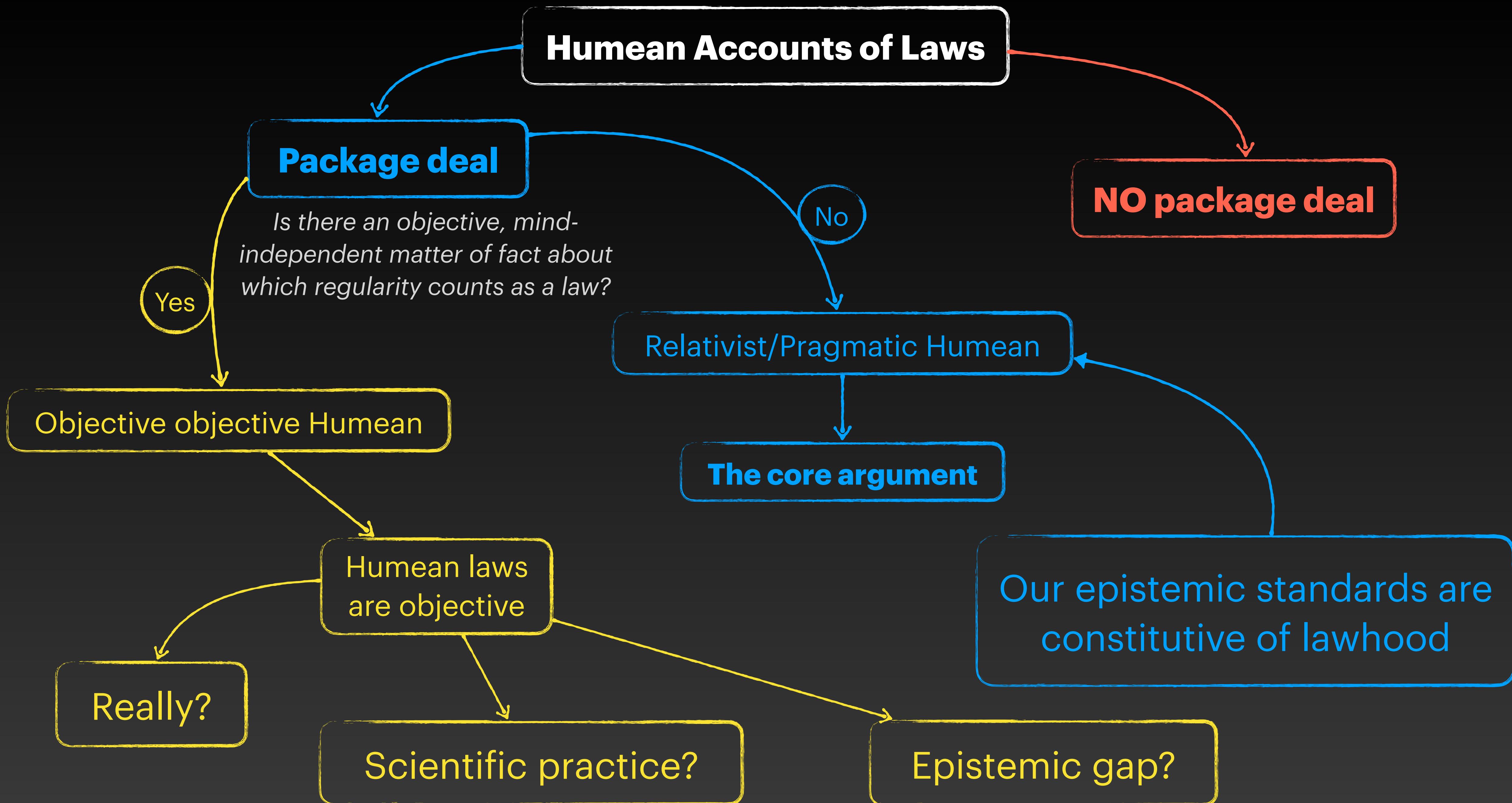
No

### NO package deal

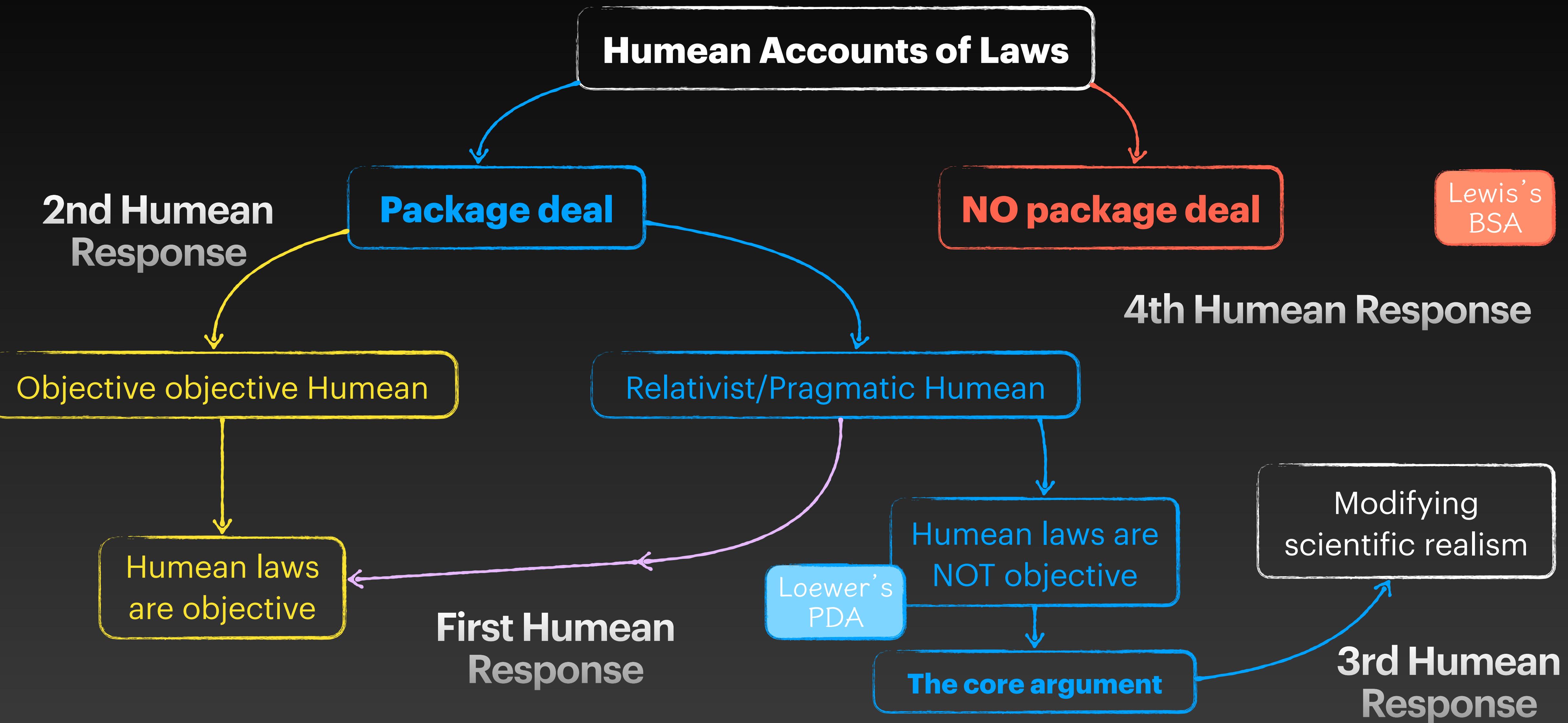
Relativist/Pragmatic Humean

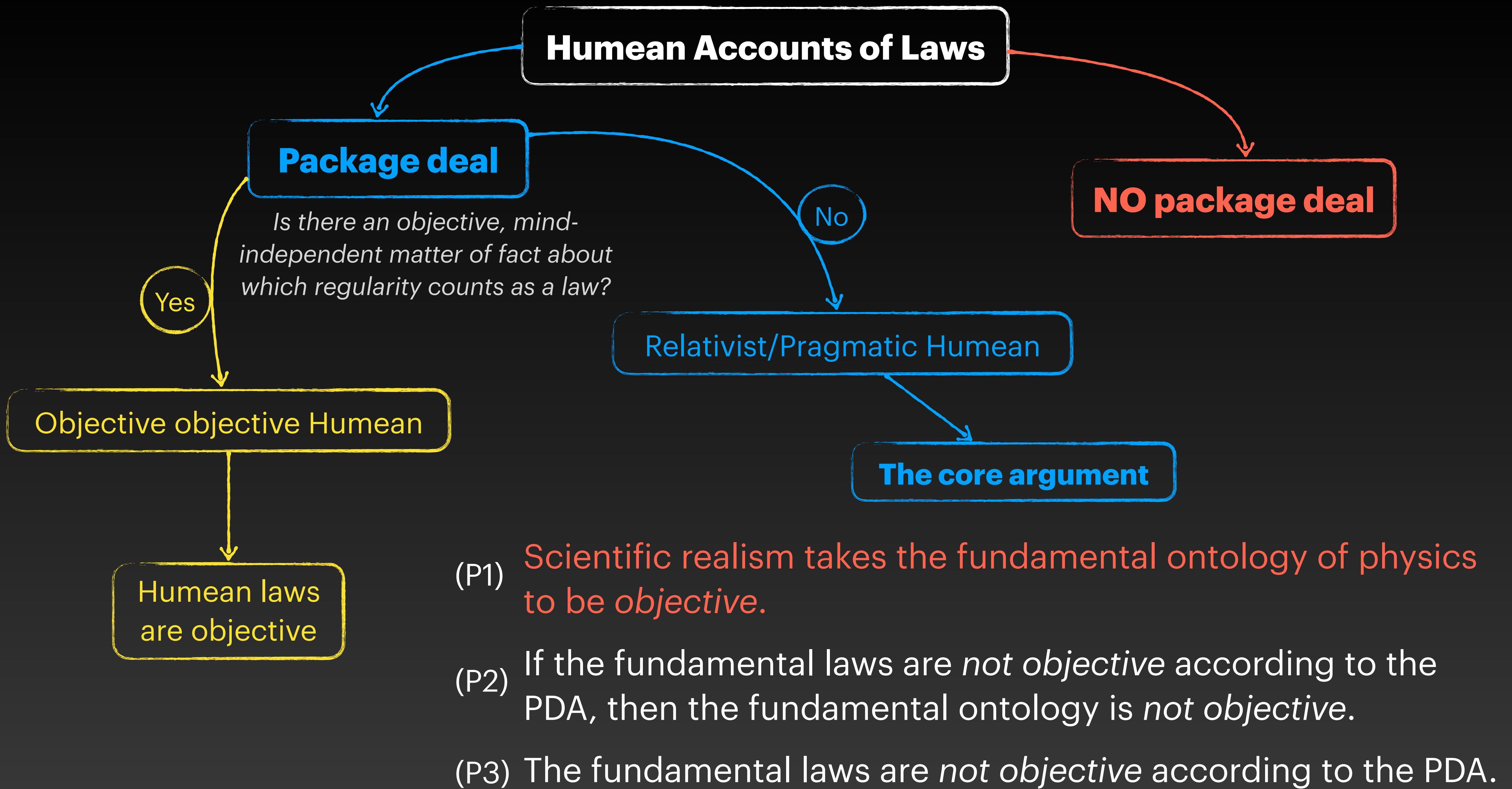
The core argument





# Outline





## Humean Accounts of Laws

### Package deal

*Is there an objective, mind-independent matter of fact about which regularity counts as a law?*

Yes

Objective objective Humean

Humean laws  
are objective

No

### NO package deal

Relativist/Pragmatic Humean

### The core argument

Relativism?  
Pluralism?

Structural  
Realism?

Internal  
Realism?

# Humean Accounts of Laws

## Package deal

*Is there an objective, mind-independent matter of fact about which regularity counts as a law?*

Yes

## Objective objective Humean

### Humean laws are objective

Really?

Scientific practice?

Epistemic gap?

No

## NO package deal

## Relativist/Pragmatic Humean

*Do Humean criteria for the best system track actual scientific practice?*

Criteria like simplicity and strength are just placeholders

Loewer's PDA

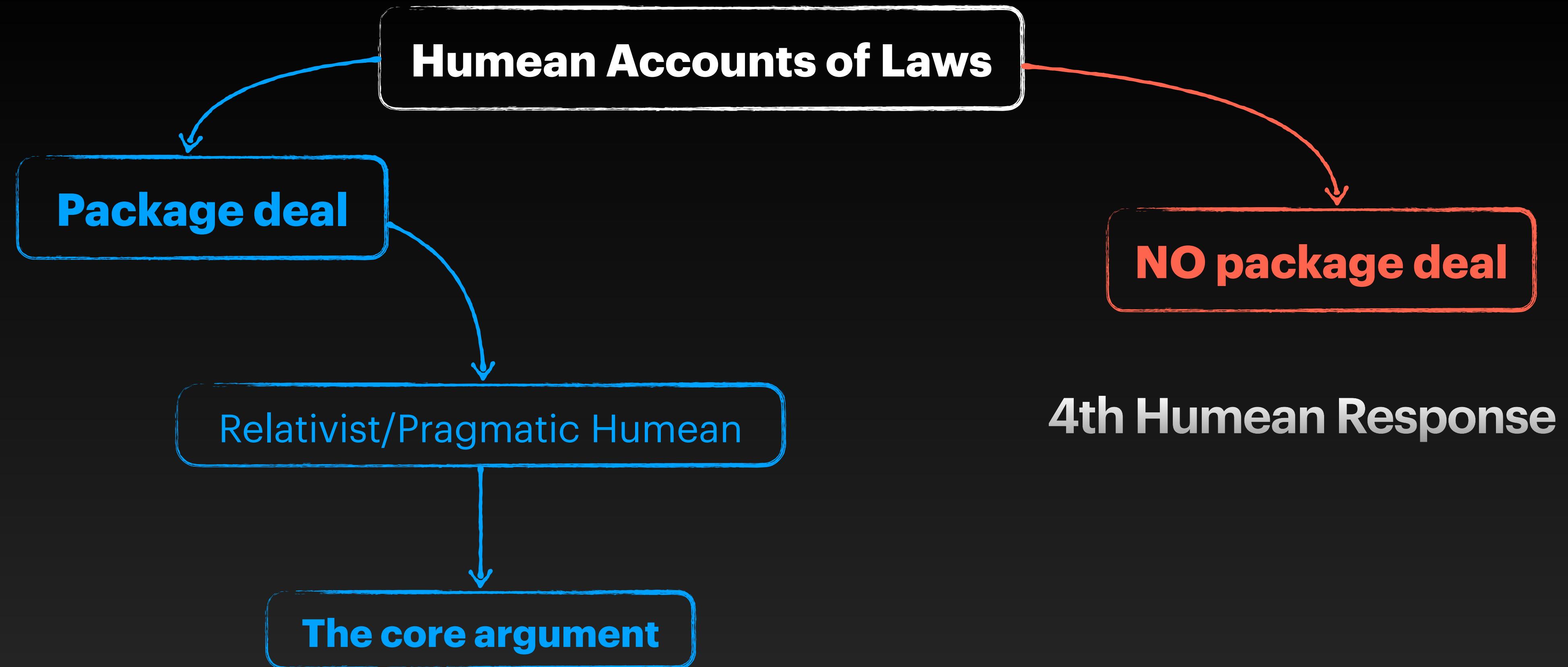
### Humean laws are NOT objective

Not Humean yet

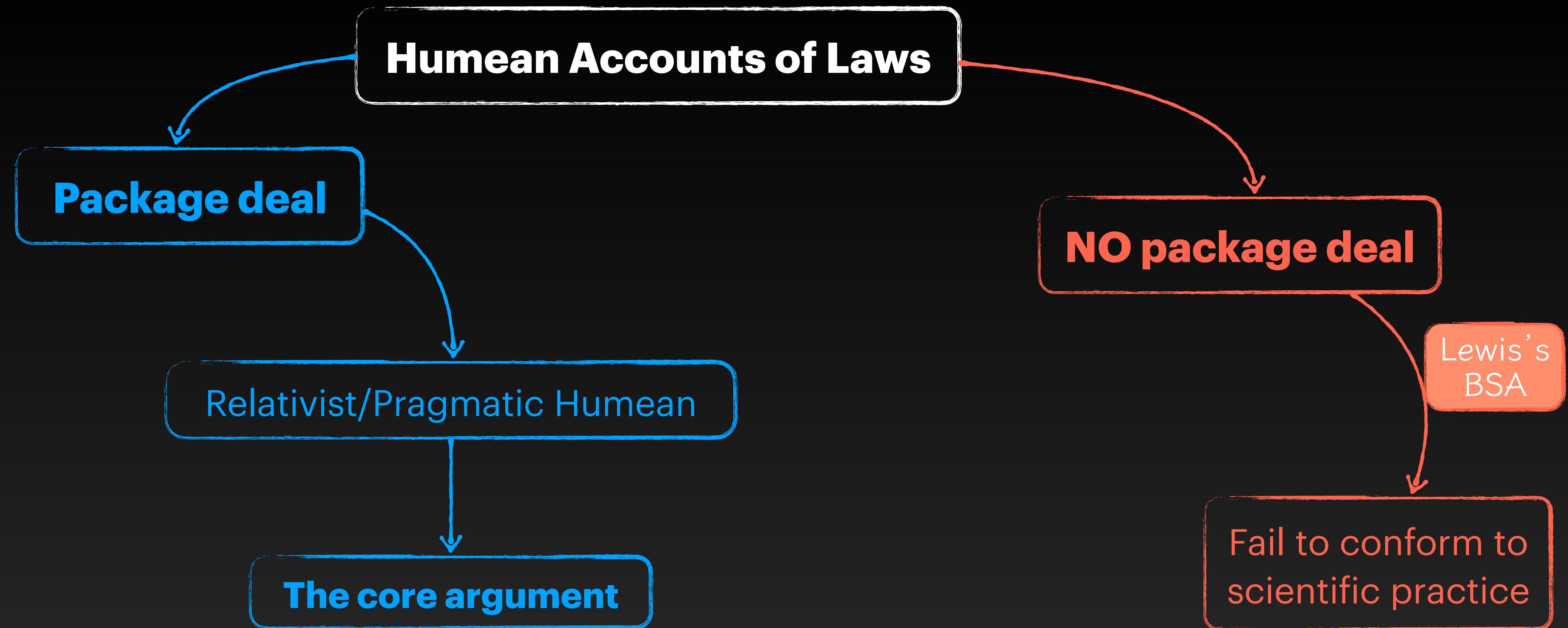
## The core argument

At odds with scientific realism

The fundamental ontology is not objective



- (P1) Scientific realism takes the fundamental ontology of physics to be *objective*.
- (P2) If the fundamental laws are *not objective* according to the PDA, then the fundamental ontology is *not objective*.
- (P3) The fundamental laws are *not objective* according to the PDA.



- (P1) Scientific realism takes the fundamental ontology of physics to be *objective*.
- (P2) If the fundamental laws are *not objective* according to the PDA, then the fundamental ontology is *not objective*.
- (P3) The fundamental laws are *not objective* according to the PDA.

# NO package deal

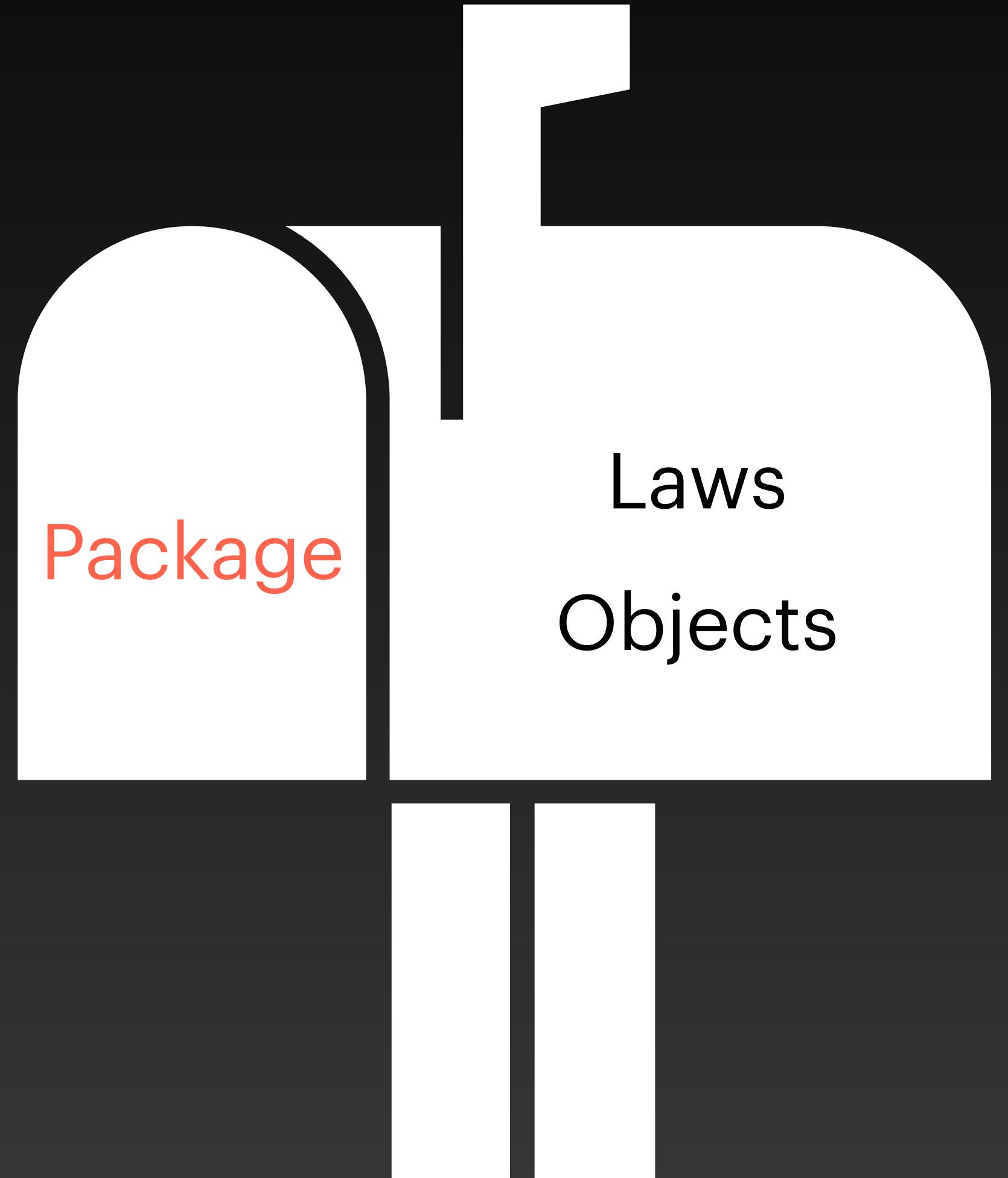
- The Humean mosaic is *metaphysically prior* to everything else, including laws of nature.
- laws are inferred as a way to systematically summarize the Humean mosaic
  - failing to conform to **Scientific practice**

Lewis's  
BSA

Fail to conform to  
scientific practice

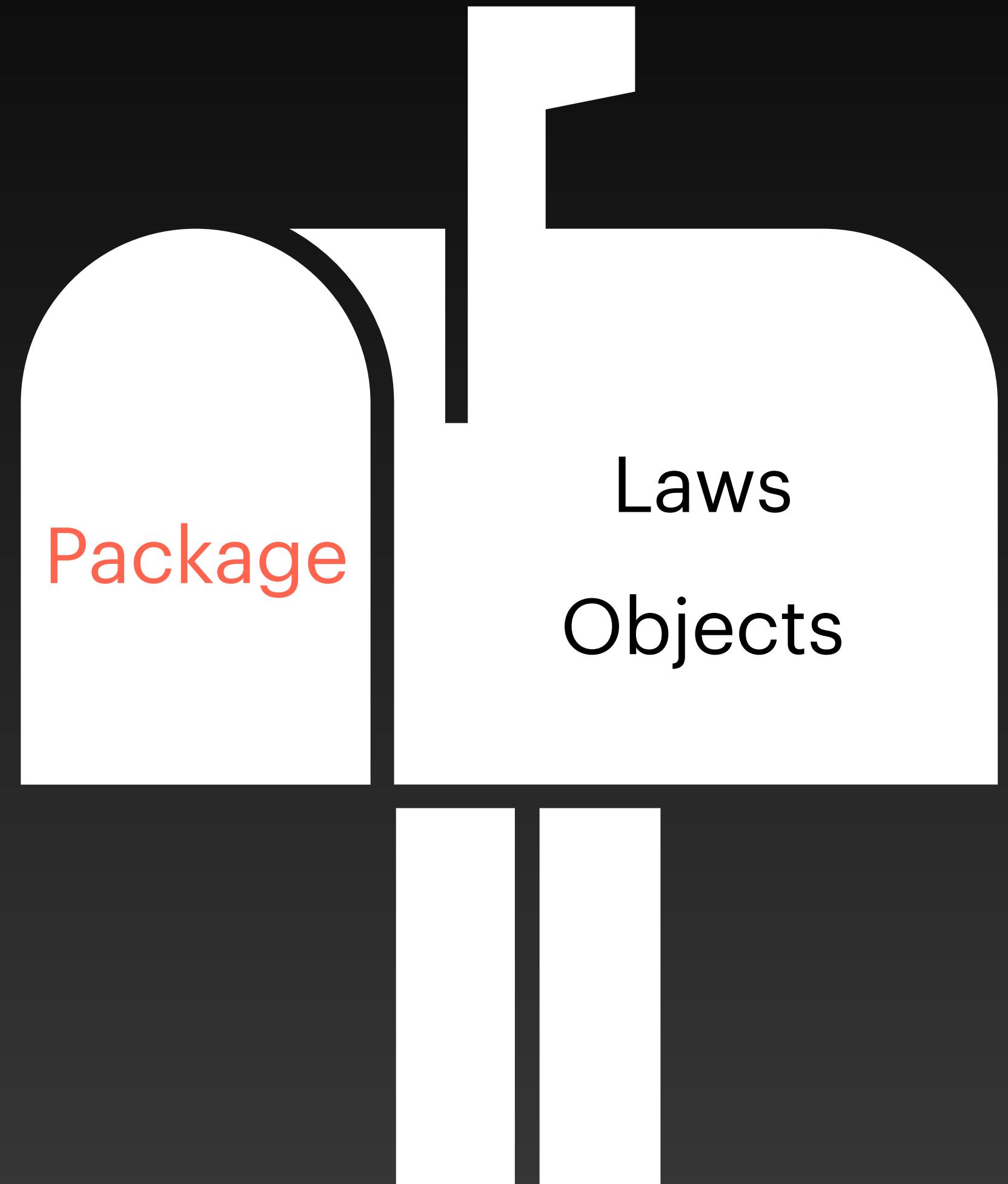
# Scientific practice

- To accept certain scientific objects as physical and real is to accept that there are the corresponding laws.



# Scientific practice

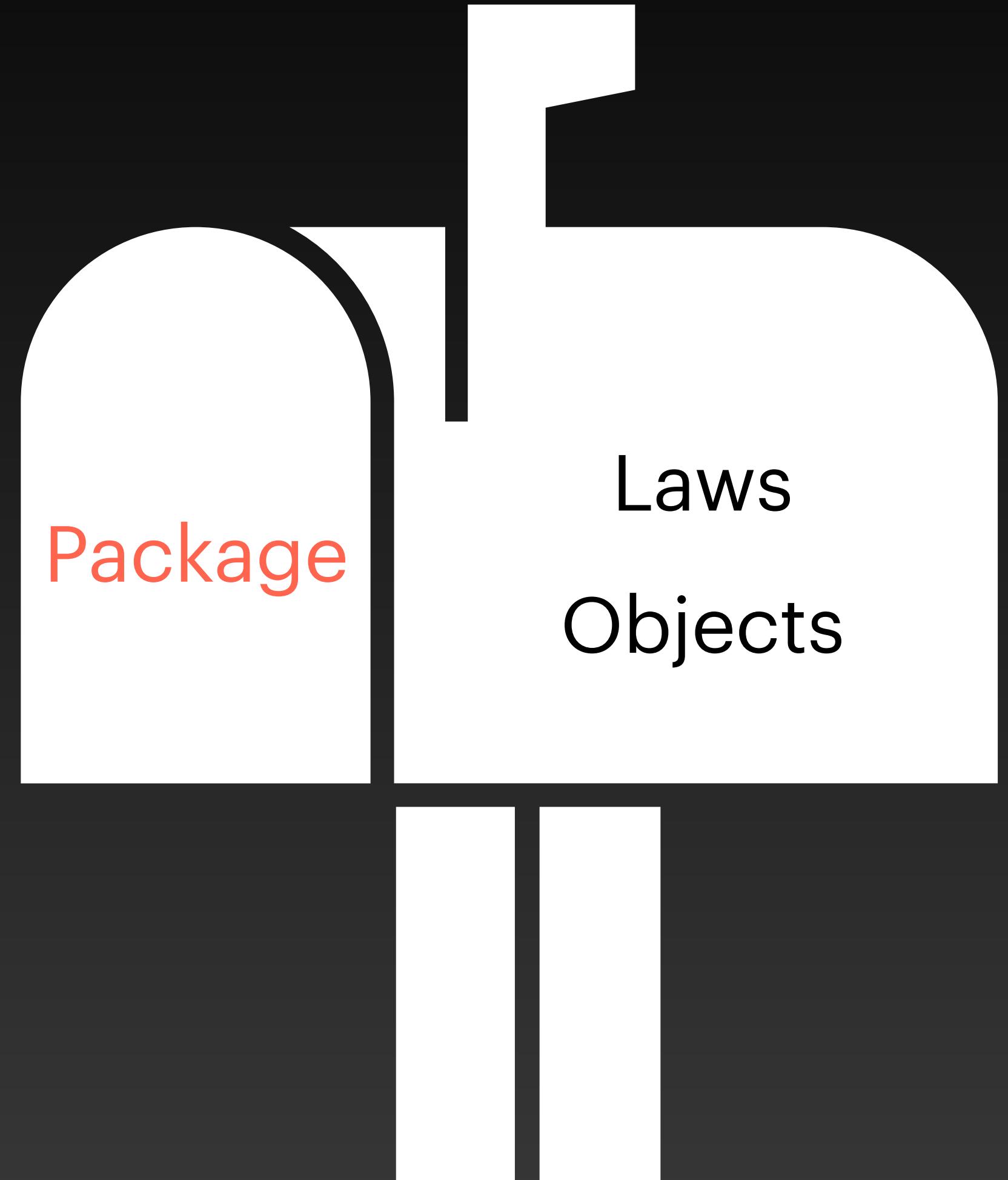
- To accept certain scientific objects as physical and real is to accept that there are the corresponding laws.
- It is the fundamental objects and laws *together as a package* that best summarize *the manifest image*



# Scientific practice

- To accept certain scientific objects as physical and real is to accept that there are the corresponding laws.
- It is the fundamental objects and laws *together as a package* that best summarize *the manifest image*

*Metaphysical, not epistemic*



# NO package deal

Package

Laws  
Objects

Lewis's  
BSA

Fail to conform to  
scientific practice

At odds with  
scientific realism

# NO package deal

- Scientific realism characterized earlier



Lewis's  
BSA

Fail to conform to  
scientific practice

At odds with  
scientific realism

# NO package deal

## Science

### Theories

A number of propositions & equations

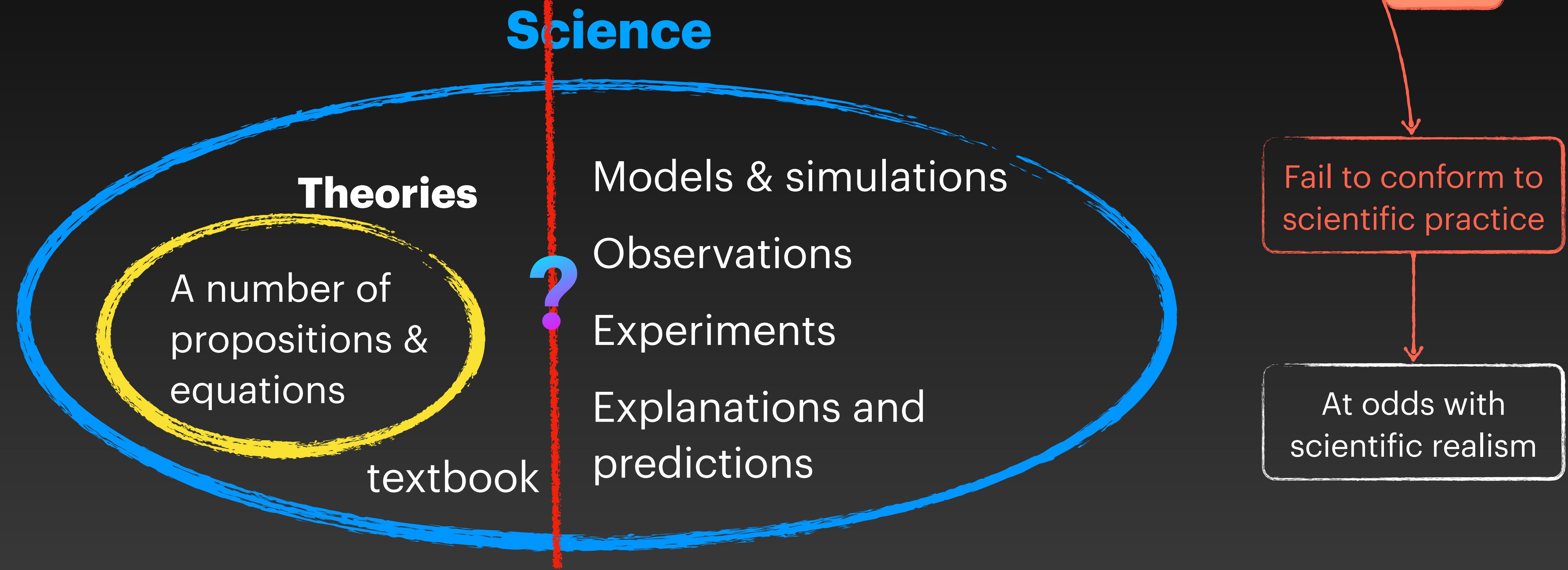
Models & simulations  
Observations  
Experiments  
Explanations and predictions

Lewis's BSA

Fail to conform to scientific practice

At odds with scientific realism

# NO package deal



# NO package deal

## Science

Theories

Scientific Practice

Lewis's  
BSA

Fail to conform to  
scientific practice

At odds with  
scientific realism

# Summary

- Humean accounts of laws are at odds with scientific realism.
  - **Package deal** (e.g., Loewer's PDA): faces the danger of making the fundamental ontology not objective;
  - **No package deal** (e.g., Lewis's BSA): faces the problem of not conforming to scientific practice.