

Lecture 1: **The problem of induction**

‘Hume's Fork’

There are two kinds of truths: those that are based on “relations of ideas” and those based on “matters of fact.” Often this distinction is seen as a precursor of the analytic/synthetic distinction. This suggests two kinds of knowledge of statements. Here’s how Hume puts it:

“Relations of Ideas [are] either intuitively or demonstratively certain. Propositions of this kind are discoverable by the mere operation of thought, without dependence on what is any where existent in the universe ... Matters of fact, which are the second objects of human reason, are not ascertained in the same manner ... The contrary of every matter of fact is still possible; because it can never imply a contradiction ... We should in vain, therefore, attempt to demonstrate its falsehood.” (*Enquiry* IV:1–2)

We can directly know the truth of statements based on relations of ideas by *reflection*, we can only directly know statements based on matters of fact through *observation*.

Induction and deduction

But what about truths that we can neither directly establish by reflection, nor by observation? Expanding what we can directly know requires reasoning. Every line of sound reasoning can be represented as a valid argument.

Example of a **deductive** argument:

1. If a bread contains rye, then it is nourishing
2. This bread contains rye
3. Therefore, this bread is nourishing

Example of an **inductive** argument:

1. Whenever I’ve eaten bread, it has nourished me
2. Therefore, eating this bread will nourish

Deductive arguments can be understood in terms of a necessary connection between premises and conclusion: necessarily, if the premises are true, the conclusion is true. An inductive piece of reasoning does neither allow for, nor require this kind of necessity. It seems possible that the premises are true and the conclusion false, even if it is unlikely.

Two problems of induction

Descriptive problem

There first is a descriptive problem: how do people form beliefs about matters of fact that are “beyond the immediate impressions of our memory and senses” (*Treatise*, 89)? We exploit some kind of connection between premises that leads us to believe the conclusion, but the connection we exploit doesn’t seem to be a logical inference rule (e.g. modus ponens).

Hume’s answer is that every inductive inference somehow relies on our grasp of connections between causes and their effects (e.g. eating bread causes nourishment).

All reasonings concerning matter of fact seem to be founded on the relation of *Cause and Effect*. By means of that relation alone we can go beyond the evidence of our memory and senses. If you were to ask a man, why he believes any matter of fact, which is absent; for instance, that his friend is in the country, or in France; he would give you a reason; and this reason would be some other fact; as a letter received from him, or the knowledge of his former resolutions and promises. (*Enquiry*, IV.i.22)

We will look at Hume's precise understanding of causation in Lecture 3. What matters here is that cause-effect relations cannot themselves be grasped *a priori*, but are based on experience.

"I shall venture to affirm, as a general proposition, which admits of no exception, that the knowledge of this relation [of cause and effect] is not, in any instance, attained by reasonings *a priori*; but arises entirely from experience, when we find that any particular objects are constantly conjoined with each other. Let an object be presented to a man of ever so strong natural reason and abilities; if that object be entirely new to him, he will not be able, by the most accurate examination of its sensible qualities, to discover any of its causes or effects. (*Enquiry* IV.i.23)

Normative problem

Now we know how we draw inductive inferences. But are we justified to do so? If it's true that all inductive reasoning is based on our grasp of cause-effect relations, then are we entitled to form inductive beliefs in this way? This is a normative problem about *epistemic justification*. When people talk about "the problem of induction" they typically have the normative problem in mind.

The problem is that we don't have *a priori* justification for believing that, say, eating bread causes nourishment. We believe this too only based on past experience. If such causal claims are true, they are true only contingently.

Experience is a good source of knowledge. But inductive inferences aren't about what we have experienced, they are about what we have not (yet) experienced. And what guarantees that the causal connections we've observed continue to hold? This is the core of the normative problem:

The bread, which I formerly eat, nourished me; that is, a body of such sensible qualities was, at that time, endued with such secret powers: but does it follow, that other bread must also nourish me at another time, and that like sensible qualities must always be attended with like secret powers? The consequence seems nowise necessary. At least, it must be acknowledged that there is here a consequence drawn by the mind; that there is a certain step taken; a process of thought, and an inference, which wants to be explained. (*Enquiry* IV.ii.29)

The missing step here is the assumption that nature is uniform (UN): *if x and y have been regularly connected in my experience, then this connection holds generally in nature.*

1. Whenever I've eaten bread, it has nourished me
2. Nature is uniform (UN)
3. Therefore, eating this bread will nourish

This would justify the inference, but only if we are justified to believe UN. And here's the problem: UN is not a necessary truth, as its denial is perfectly coherent. So if it is true, it is true contingently. And then we could know of its truth only through experience. But at best we will have seen that *in our experience* nature has been uniform. How do we know that nature is uniform, period, i.e. that its uniformity extends to parts of nature we have not yet experienced?

At this point, it seems our reasoning becomes circular. If we infer UN from past experience, then this inference must itself be an inductive inference. And an inductive inference is only justified if our belief in UN is justified. But our belief in UN is only justified, it seems, if we can inductively infer UN from past experience! Should we conclude that we are not justified to believe UN?

Can we solve the problem of induction?

One way of responding to Hume's sceptical challenge is to say that he places the bar too high. Our beliefs are justified already if we arrive at them in a reliable way. And taking the past to be representative is a reliable way, or so the evidence suggests. This is *reliabilism* about epistemic justification. This gives us justification for our inductive conclusions, not for our belief in UN.

Hume himself seems to have had a different response, however. He suggests that our belief in UN is justified simply because it is *natural*, and we have not encountered any reason to the contrary.