David Hume, Empiricism & The Problem of Induction

But what if these profound disquisitions into the first principles of human nature, do naturally and necessarily plunge a man into this abyss of scepticism? May we not reasonably judge so from what hath happened? Des Cartes no sooner began to dig in this mine, than scepticism was ready to break in upon him. He did what he could to shut it out. Malebranche and Locke, who dug deeper, found the difficulty of keeping out this enemy still to increase; but they laboured honestly in the design. Then Berkeley, who carried on the work, despairing of securing all, bethought himself of an expedient;—By giving up the material world, which he thought might be spared without loss, and even with advantage, he hoped, by an impregnable partition, to secure the world of spirits. But, alas! the “Treatise of Human Nature” wantonly sapped the foundation of this partition, and drowned all in one universal deluge.

— Thomas Reid, An Inquiry into the Human Mind (1764)

We have no right to assume that any physical laws exist, or if they have existed up to now, that they will continue to exist in a similar manner in the future.

— Max Planck, The Universe in the Light of Modern Physics (1931)

I argue for an empiricist position and against scientific realism. Constructive empiricism...is the specific philosophical position that I...advocate. I use ‘constructive’ to indicate my view that scientific activity is one of construction rather than discovery: construction of models that must be adequate to the phenomena, and not discovery of truth.

— Bas Van Fraassen, The Scientific Image (1980; italics mine)

The Big Ideas to Master

- Academic skepticism
- Deductive vs. inductive reasoning
- Formal vs. informal fallacies
- The regularity principle
- Relations of ideas vs. matters of fact
- Analytic vs. synthetic statements
- Necessary vs. contingent statements
- The problem of induction

David Hume & empiricism’s natural end: academic skepticism

Of all the empiricists, the eighteenth-century Scottish philosopher David Hume is arguably the most important one. This, however, is not because his defense of the theory is the best of those ever produced. Rather, it is due to the fact that Hume makes the case that if empiricism is true, then we must be committed to a kind of skepticism about the external world. But which form? Here we must distinguish two varieties: academic versus Pyrrhonian skepticism. Hume accepts the former and rejects the latter. According to the latter type, knowledge regarding the external world is impossible because it requires infallibility and our evidence can never deliver us into such a state. Even worse, given the nature of the evidence we do have, we must suspend all judgements about the external world. However, we can know some things, but it is very limited in scope. Argues the Pyrrhonian, the only knowledge of which any of us is capable is knowledge of how things appear to an individual. For instance, she argues that a person cannot know that

(i) There is a red apple on the table before me.

At best, a person can know that

(ii) I am being appeared to as if there is a red apple on the table before me,

or that

(iii) I am being appeared to as if there is a table before me,

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1 The Scottish philosopher Thomas Reid was a contemporary of Hume. Two interesting things about Reid. First, Hume’s An Enquiry Concerning Human Understanding was to a large degree written as reply to Reid’s attacks against his Treatise of Human Nature. Second, Reid was a deeply committed (Berkeleyan) empiricist until he read Hume’s Treatise. His description of his coming to see the philosophical implications of Hume’s ideas is not nearly as famous as Kant’s description of being awoken from dogmatic slumbers, but it’s definitely in the same spirit and arguably more humorous.
(iv) I am being appeared to as if there are red apples,
(v) I am being appeared to as if there are red things,

etc. Any attempt to claim something about the external world itself cannot be justified. The other variety of skepticism, academic skepticism, also denies knowledge of the external world is possible, but accepts the existence of justified or credible belief. It is this variety that Hume accepts. However, what gives us credible belief in Hume’s system is remarkably different that most would think. For it is not evidence that justifies our believings; it is psychological laws of association coupled with the view that there is a pre-established harmony between our mental faculties and our success in the world. (Note: there is an important sense, however, where Hume also agrees with the Pyrrhonian about (i)–(v). However, he also seems to go even further; he argues that we cannot even really know (ii)–(v). For we cannot know that I am having those appearances. At best, I can know appearances are happening, but cannot know anything more than that if even that.) That he thinks this is most obvious when we consider his attack on the rationality of inductive reasoning.

Hume’s Attack on inductive reasoning

According to Hume, all inductive reasoning requires a commitment to the regularity principle, that is, the claim that

REGULARITY. The future will resemble the past.

REGULARITY tells us that there is regularity in nature. Argues Hume, REGULARITY is the all-important principle for inductive reasoning that links the evidence to the conclusion such that, without it, inductive reasoning cannot work. This is because inductive reasoning involves making a probabilistic inference from what has been true in the past to what will be true in the future, and what has been true in the past can guide you about the future only if there is regularity in nature. Put another way, one cannot make an appropriate inference from what is true about a sample (e.g., what has been true in the past, what is true of the apples from a barrel that have been inspected, etc.) to what is probably true of the things “outside” the sample (e.g., what will be true in the future, what is true of the apples from a barrel that have not been inspected) unless she is committed to the claim that the sample is representative of things that are not part of the sample.\(^2\)

Hume’s attack: The Problem of Induction

Hume asks the following simple question: is it possible to justify REGULARITY? His answer is ‘no’. Why? According to Hume, there is no non-question-begging argument to justify REGULARITY. What is a question-begging argument? An argument a is question-begging if a is a circular argument (where an argument a is circular if one of the premises of a is the conclusion that a is supposed to justify). Accordingly, Hume argues that any attempt to justify REGULARITY by way of an argument will always presuppose that REGULARITY is true thereby making the attempt to justify REGULARITY question-begging. Call this The Problem of Induction. Why does Hume think that there is no non-question-begging (i.e., non-circular) argument to justify REGULARITY? To answer this, let us first consider the following important distinctions.

On two types of propositions: relations of ideas vs. matters of fact

Hume argues that all propositions—i.e., the content expressed by a declarative sentence or simply its meaning—fall into one of two categories: relations of ideas or matters of fact. Here is what he means:

\(^2\) As we can see, REGULARITY is actually a claim about the evidential relationship that holds between a representative sample of some category of things and the whole category of those things. That is, REGULARITY tells us that when a sample of things that belong to a class c is a representative sample, our study of that sample gives us “evidential guidance” about every member of c. Given that “evidential guidance,” we are warranted to make an inductive inference about every member of c from the sample (so long as that inference is does not “go beyond” that “evidential guidance”).
RELATIONS OF IDEAS: A proposition $p$ is a relation of ideas iff $p$ is a declarative sentence that is either intuitively certain or $p$ is a declarative sentence that is demonstrably certain.

MATTERS OF FACT: A proposition $p$ is a matter of fact iff $p$ is a declarative sentence that is neither intuitively certain nor demonstrably certain.

An important point about relations of ideas: by ‘intuitively certain,’ Hume means this: a proposition $p$ is intuitively certain iff $p$'s being true is self-evident; by ‘demonstrably certain,’ he means this: a proposition $p$ is demonstrably certain iff $p$’s being true is evident via a formal method of proof. An example of an intuitively certain statement is that all bachelors are unmarried; an example of a demonstrably certain statement is that $a^2 + b^2 = c^2$. An example of a matter of fact statement is that there are more than two people in the room.

You should notice that the distinction is really an epistemological one, that is, it is a distinction regarding how we come to know whether a declarative sentence is true or false. Of course, that is a superficial or glossary description of the difference; there is more we need consider to understand what he is claiming. For instance, it involves important issues regarding the nature of language and truth. Let us take a closer look at the distinction by considering three other distinctions.

Three important distinctions

An epistemological distinction: a priori vs. a posteriori (epistemic) justification

Epistemology is that field of philosophical inquiry that is concerned with the nature and scope of human knowledge. As such, epistemologists seek to answer such questions as Is (human) knowledge possible? and If that knowledge is possible, what is required to have that knowledge and what kinds of things can be known? To answer such questions, we must inquire into the necessary conditions for a human being to have knowledge. One such condition is the epistemic justification condition (where a belief $b$ is epistemically justified if there is some condition $c$, such that $b$ satisfies $c$). What is the requisite epistemic justification condition? Although philosophers disagree about the details of that condition, they agree that condition recognizes two broad types of epistemic justification: a priori epistemic justification and a posteriori epistemic justification. But first

- A priori epistemic justification: a person $S$ is epistemically justified a priori in believing that a proposition $p$ is true only if (i) $S$ has some justifier $j$ for believing that $p$ is true, and (ii) $S$’s having $j$ does not require that $S$ be able to appeal to a particular sensory experience $e$.

Putative examples of propositions that a person might be epistemically justified a priori to believe: that all red apples are red, that all Euclidean right triangles satisfy the Pythagorean Theorem (i.e., $a^2 + b^2 = c^2$), etc.

- A posteriori epistemic justification: a person $S$ is epistemically justified a posteriori in believing that a proposition $p$ is true only if (i) $S$ has some justifier $j$ for believing that $p$ is true, and (ii) $S$’s having $j$ does require that $S$ be able to appeal to a particular sensory experience $e$.

Putative examples of propositions that a person might be epistemically justified a posteriori to believe: that there are more than two people in the room, that the atomic number of gold is 79, that water is $\text{H}_2\text{O}$, etc.

A linguistic distinction: analytic vs. synthetic truth-values

This is a distinction regarding what makes a sentence true, the truth-maker as it were. To be sure, the straightforward answer is that facts are the truth-makers. However, there are different kinds of facts. For
simplicity, let us distinguish between linguistic and non-linguistic facts. Analytic statements are made true by the former; synthetic statements are made true by the latter.

- **Analytic**: a statement $s$ is analytically true only if (i) $s$ is true and either (ii) $s$ is true in virtue of the form of $s$ or (iii) $s$ is true in virtue of the predicate concept of $s$ being “contained in” the subject concept of $s$.

Putative examples of propositions that are analytically true: that red apples are red, that bachelors are unmarried, etc.

- **Synthetic**: a statement $s$ is synthetically true only if (i) $s$ is true and (ii) $s$ is true in virtue of the predicate concept of $s$ “extending” the subject concept of $s$.

Putative examples of propositions that are synthetically true: that whales are mammals, that the atomic number of gold is 79, that water is H$_2$O, etc.

**A modal distinction**: necessary vs. contingent truths

In addition to the analytic–synthetic distinction regarding truth, the truth-value of declarative sentences is modal: it’s tied to possible worlds. Some sentences have their truth-value necessarily; some sentences have their truth-value contingently.

- **Necessary truth**: a sentence $s$ is necessarily true iff (i) $s$ is true and (ii) there is no possible world where $s$ is false.

- **Contingent**: a sentence $s$ is contingently true iff (i) $s$ is true and (ii) there is at least one possible world where $s$ is false.

(Note: the same can be stated for falsity. Necessarily false sentences are false in all possible worlds; contingently false sentences are false in some, but not all possible worlds.) For instance, the statements ‘all bachelors are unmarried’ and ‘water is H$_2$O’ are necessarily true whereas the statements ‘all crows are black’ and ‘there are at least two people in the room’ are contingently true. Notice that there are also statements that are necessarily and contingently false, respectively, e.g., the sentences ‘all triangles are circles’ and ‘Cal Poly has less than ten thousand students’.

With these distinctions in mind, we can now understand Hume’s relation of ideas/matters of fact distinction. As we saw, RELATIONS OF IDEAS tells us that a statement $s$ is a relation of ideas iff $s$ is intuitively or demonstrably certain. This is on account of the fact that Hume takes it that

H1: All relations of ideas are analytic, necessary truths that are only a priori knowable.

If H1 is true, then what makes such statements intuitively or demonstrably certain is the fact that they are analytic, necessary truths and we can have a priori knowledge that such statements are true. Moreover, we saw that MATTERS OF FACT tells us that a statement $s$ is a matter of fact iff $s$ is neither intuitively nor demonstrably certain. This is on account of the fact that Hume takes it that

H2: All matters of fact are synthetic, contingent truths that are only a posteriori knowable.

If H2 is true, then such statements are neither intuitively nor demonstrably certain in virtue of the fact that they are synthetic, contingents truths that we can only know a posteriori.

With this in mind, let us return to Hume’s claim that REGULARITY cannot be justified.

Says Hume, given our understanding of the relation of ideas/matter of fact distinction, we can see that REGULARITY is a matter of fact. It is neither analytic, necessary nor a priori knowable. As such, we can see that if it is true, it is a synthetic, contingent truth that is only known a posteriori. What could justify such a statement? Since REGULARITY is a matter of fact, it is rational to accept REGULARITY only if it can be justified in the same way that any other matter of fact can: on the basis of a posteriori content. Yet, we have to ask
what a posteriori content could in principle justify REGULARITY. The answer depends on what type of matter of fact REGULARITY is.

All matters of fact are of one of three types: if a statement $s$ is a matter of fact, then $s$ is either an occurrent matter of fact, a memorial matter of fact, or an unobserved matter of fact. Argues Hume, REGULARITY is an unobserved matter of fact. What is an unobserved matter of fact? It is understood as follows:

$\text{MF}_{\text{unobserved}}$: A statement $p$ is an unobserved matter of fact iff $p$ describes a “region” of the universe that is neither in a person’s immediate spatial nor temporal environment.

According to $\text{MF}_{\text{unobserved}}$, any statement that is an unobserved matter of fact is one that is about some region of space that is different from the location of the person who is considering the statement or about some temporal point that is not present, but in the past or the future. Since unobserved matters of fact, then, are claims about the goings-on of a place or time other than the person considering the claim is “located,” we need to ask how we can determine whether or not an unobserved matter of fact is true? Argues Hume, there is only one possible way: via inductive reasoning. That is, Hume argues that the following knowledge principle is true:

$\text{K(MF}_{\text{unobserved}})$: A person $S$ knows that an unobserved matter of fact statement $p$ is true only if $S$ knows a posteriori that $p$ is true via inductive reasoning.

Notice that if $\text{K(MF}_{\text{unobserved}})$ is true, then we don’t know that unobserved matters of fact are true via sensory impressions of our immediate environment at a time $t$ or via a memory at $t$ of a sensory impression that we had of our immediate environment at some time $t-1$. We only know they are true via induction. However, argues Hume,

$\text{UPR}$: An inductive inference is appropriate only if we are epistemically justified in being committed to REGULARITY.

So, a person cannot make a good inductive inference unless she is committed to the truth of REGULARITY. That is, given UPR, unless REGULARITY is epistemically justified, no inductive inference is justified. If that is true, then we see “the rub” of the issue: since (i) we can determine that REGULARITY is true only in the same way that we can determine whether any unobserved matter of fact is true—namely, only on the basis of inductive reasoning—and (ii) given UPR, every instance of an appropriate inductive inference depends on REGULARITY, that implies that (iii) the only possible justification of REGULARITY is via an appeal to REGULARITY. But an appeal to REGULARITY cannot rationally justify REGULARITY. That is a circular, question-begging argument. Here is his argument stated in an enumerated form:

Hume’s Problem of Induction Argument

(1) All unobserved matters of fact are epistemically justified only by way of inductive reasoning. [Premise]
(2) All inductive reasoning presupposes that REGULARITY is true. [Premise]

So,
(3) All unobserved matters of fact are epistemically justified only by way of presupposing that REGULARITY is true. [From 1,2]
(4) REGULARITY is an unobserved matter of fact. [Premise]

Therefore,
(5) REGULARITY is epistemically justified only by way of presupposing that REGULARITY is true. [From 3,4]
(6) No claim $C$ is epistemically justified by presupposing that $C$ is true. [Premise]

Hence,
(7) There is no non-circular justification for REGULARITY. [From 5,6]
Thus,
(8) REGULARITY cannot be justified. [From 7] \(^3\)