**VERIFICATIONISM** | Lent 2019 | Maarten Steenhagen (ms2416@cam.ac.uk)
http://msteenhagen.github.io/teaching/2019ver/

Lecture 1: **The verification principle**

A.J. Ayer (1946) *Language, Truth and Logic*. 2nd ed. (London: Gollancz), Intro. & ch. 1.

## Empirical hypotheses

Science and metaphysics both make claims about how the world is. (e.g. 'Not everything is conscious'; 'All mammals have three middle ear bones'; 'Time is relative to an observer'). Such claims are 'hypotheses' and we can ask whether they are true or false. Such questions can lead to disagreements among scientists, among metaphysicians, and among metaphysicians and scientists. If such a disagreement cannot (now) be settled, then we should take both parties to be rival views of reality. This puts science and metaphysics on a par.

Recall what Hume said: "If we take in our hand any volume; of divinity or school metaphysics, for instance; let us ask, Does it contain any abstract reasoning concerning quantity or number? No. Does it contain any experimental reasoning concerning matter of fact and existence? No. Commit it then to the flames: for it can contain nothing but sophistry and illusion."

Ayer offers a 'semantic weeding tool' where Hume provided a psychological one. Ayer writes: "one cannot overthrow a system of transcendent metaphysics merely by criticizing the way in which it comes into being. What is required is rather a criticism of the nature of the actual statements which comprise it." (1946, p.34)

## Logical positivism

Ayer was strongly influenced by Logical Positivism. This movement in philosophy of science started in Vienna in the 1920s and 1930s. Moritz Schlick lead the group, which further included Otto Neurath, Rudolf Carnap, and Rose Rand, among others. They are know as the 'Vienna Circle' or 'Wiener Kreis'. Ayer visited the circle during his studies, and this visit inspired him to write *Language, Truth and Logic* (1936).

In the book Ayer defends a criterion of factual significance: a principle that tells you of any statement that purports to be about the world whether it actually says something about the world. The core idea is that a statement can only say something about the world (be factually significant) if it can be *verified* in experience. Consequently, if a statement is not verifiable in this way, it is not factually significant.

## What is it to verify a statement?

Keep in mind that 'verifiable' is a technical term with a precise definition. In its simplest and strongest form (and most problematic, as we'll see), the verification theory of meaning says:

> **Strong verification theory**
> *1. A statement S is verifiable if and only if there is some set of observation sentences which logically entail S*
> *2. A statement S is factually significant if and only if S is verifiable in principle*

Call any sentence that can be immediately confirmed in experience an observation sentence. For example, the sentences "This is red" (made when pointing at an apple) and "This is sour" (when biting in an apple) are immediately confirmable. You can see immediately whether the thing you're pointing to is red or not, and so see immediately whether the sentence "This is red" is true or not. Observation sentences are (trivially) verifiable, and so they are factually significant.

Now take the hypothesis "This is a grape", when pointing at a grape. Are there observations we can make to see immediately whether this sentence is true? Not obviously, because all we *observe* is, say, a thing that is red and round. (Our retina has colour and shape detectors, not grape detectors!)

But let's say that 'grape' is defined as a round thing that is either red or green. We can then see that the truth of "This is red" and "This is round" entails the truth of "This is a grape". Exploiting this connection between observation sentences and an hypothesis allows us to conclude that also "This is a grape" is verifiable, and hence factually significant.

(If you think this is trivial or false, because you think that we can observe grapes immediately, then consider a more sophisticated empirical term, e.g. "This is electrically charged", and try to give an analysis of its meaning in terms of observation sentences.)

Note, we need not *actually* verify a sentence for it to be meaningful to us. What matters is that we know how to verify it. Consider "The item in this box is red". This is meaningful because we know that we can determine its truth-value by opening the box and looking inside. A factual statement is meaningful only if it is verifiable in principle.

## Analytic/synthetic distinction

The verification theory presupposes a distinction between analytic and synthetic truths, and it does so twice over.

> 1. First, recall, there are two classes of meaningful statements: *Analytic* truths do not depend on matters of fact but only on principles of logic or meaning. *Synthetic* truths depend both on matters of fact and on principles of logic or meaning. ("This is a grape" is true in virtue of the fact that this is a grape and in virtue of the fact that 'grape' means what it does.) The verification principle does not apply to analytic truths, i.e. the truths of logic and mathematics. It only applies to synthetic truths.
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> 2. Second, deriving interesting empirical statements from a set of observation sentences requires analytically true (i.e. non-empirical) premises, together with synthetic, empirical ones. For example:
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> i. This is green and round (observation sentence, synthetic)
> ii. If this is green and round, then this is a grape (definitional statement, analytic)
> iii. This is a grape (empirical claim, synthetic, by modus ponens 1,2)

## From strong to weak verification

Even if the strong verification principle were right, it would be very difficult to give a satisfactory analysis of even quite mundane empirical statements. Ayer doesn't really try this, but for a sincere attempt you could look at Rudolf Carnap's *The Logical Construction of the World* (1926) or Nelson Goodman's *The Structure of Appearance* (1951). (Both are very difficult books.)

An immediate obstacle for the strong verification principle is that not every meaningful empirical claim is entailed by a set of observation statements. Many sciences serve up perfectly fine *universal* hypotheses, e.g. that all cordates are renates, or that all stars begin their lives from the collapse of material in a giant molecular cloud, or that all mammals have three middle ear bones.

That all mammals have three middle ear bones is a well-established scientific hypothesis. But no such universal claim can be logically derived from a set of claims about particular matters of fact. A collection of observations such as "This$_1$ mammal has three middle ear bones", "This$_2$ mammal has three middle ear bones", "This$_3$ mammal has three middle ear bones", ….etc. could only entail "Many mammals have three middle ear bones". (A similar argument can be made for "No bird is cold-blooded.")

So we need a weaker verification theory, one that will also include such universal empirical hypotheses as factually significant.

> Let us call a proposition which records an actual or possible observation an experiential proposition. Then we may say that it is the mark of a genuine factual proposition, not that it should be equivalent to an experiential proposition, or any finite number of experiential propositions, but simply that some experiential propositions can be deduced from it in conjunction with certain other premises without being deducible from those other premises alone. (Ayer 1946, pp. 38- 39)

Ayer's proposal is to assume, not that some observation sentences must logically entail the empirical hypothesis in question, but that the hypothesis in question must entail at least some observation sentences that otherwise would not be entailed by relevant background assumptions.

**Weak verification theory**

*1. A statement S is verifiable if and only if there is some set of sentences* $P_1 \ldots P_n$ *and some observation sentence O such that (i) O follows from S together with* $P_1 \ldots P_n$ *but (ii) O does not follow from* $P_1 \ldots P_n$ *alone*

*2. A statement S is factually significant if and only if S is verifiable in principle*

Observation sentences again come out as trivially verifiable and hence factually significant. (That I am in Paris doesn't entail that this is red, but that this is red and I am in Paris does entail that this is red.)

Take the statement "This is a grape." By itself, this does not entail "This is sour". But if we add the hypothesis that "All grapes are sour" to our initial statement "This is a grape", it now does follow that "This is sour". Hence, our universal hypothesis, together with some other premises, entails an observation sentence ("This is sour") that is not entailed by these other premises alone. As we could put it, the hypothesis predicts specific observations, and it is for this reason that it is meaningful.

Or take "No bird is cold-blooded". "This is a bird" does not entail "This is not cold-blooded", but "This is a bird" and "No bird is cold-blooded" together does entail "This is not cold-blooded". If you find that the bird in question is indeed not cold-blooded you have found support for the hypothesis. If you find that the creature is cold-blooded you have undermined the hypothesis. (Have a look at Karl Popper's discussion of the scientific value of 'falsification', as opposed to 'verification'.)