Philosophy 408: The Language Revolution — Hamilton College
Spring 2009 — Russell Marcus
Tuesdays and Thursdays, 2:30pm - 3:45pm — rmarcus1@hamilton.edu

Class 12 - Positivism

I. Background

We started our exploration into the philosophy of language with Frege's "On Sense and Reference."
We noted several questions about the nature of senses, but pursued reference, first.
Now, we turn to senses, or meanings.
In the next few weeks, we will look more closely at some attempts to define, refine, or eliminate meanings in semantic theory.
As we will start with the positivist's verifiability theory of meaning, some background to positivism might be useful.

Frege's work was partly a response to the metaphysical speculations inherent in nineteenth-century idealism.
The logical positivists are also responding to idealism, and speculative metaphysics generally.
They were intent on ridding philosophy of what they deemed to be pseudo-problems, pseudo-questions, and meaningless language.
Focused on science, they derided such concerns as:

A. The meaning of life
B. The existence (or non-existence) of God
C. Whether the world was created, with all its historical remnants and memories, say, five minutes ago
D. Why there is something rather than nothing
E. Emergent evolutionary theory, and the elan vital
F. Freudian psychology
G. Marxist theories of history

We can see the positivist's metaphysical quarry clearly, in Ayer's derision (pp 11-12) of sentences like:

1. The absolute is lazy.

Positivism was developed in and around Vienna between WWI and WWII, by philosophers inspired by Wittgenstein's *Tractatus*.
According to the picture theory in the *Tractatus*, both the worlds and our language consist of independent atomic elements, which are combined according to strictly logical principles.
The positivists were especially concerned to establish firm foundations for empirical science.
They saw the picture theory as accommodating a scientific view of the world.
Scientific laws, for example, were mere generalization over, and reducible to, the separable atomic facts.

Among the philosophers thus influenced by Wittgenstein's *Tractatus* were Rudolph Carnap, Otto Neurath, Moritz Schlick, and Herbert Feigl.
Their group came to be known as the Vienna Circle.
There was a similar, though less-influential, group in Berlin, centered around the physicist Hans Reichenbach, called the Berlin Circle.
Positivism is also called logical empiricism, which is perhaps a more accurately descriptive name, though

I will call it just positivism.
The young A.J. Ayer visited Vienna from England and wrote about the movement he found there.
His *Language, Truth, and Logic* became the primary source for positivism for English-speaking philosophers, though most of the positivist's central works eventually were translated into English.

There is a direct line between Frege and logical positivism.
Carnap had studied with Frege.
Wittgenstein's *Tractatus* was intended, and was hailed by Russell, as the culmination of the enterprise of logical analysis begun by Frege.
Carnap's masterwork, *Der Logische Aufbau der Welt*, which attempted to reduce all of science to phenomenal experience, was itself patterned on Whitehead and Russell's *Principia Mathematica*, which had, like Frege's *Grundgesetze*, attempted to reduce all of mathematics to logic.
Carnap *Aufbau* extended the Frege-Russell project to empirical science.

It would be a mistake, though, to take the positivists as completely aligned with Frege.
For, Fregean senses, in their third realm, may well be the kinds of metaphysical objects that the positivists were deriding.
The positivists were much closer to Russell, who denied the existence of senses, than to Frege.

II. Verificationism

The positivists were also inspired by Hume's empiricism.
Remember that Hume wanted to commit to the flames, as meaningless, any speculative metaphysics.
Hume believed that for a term to be meaningful, it had to stand for an idea in one's mind that could be traced back (in some sense) to an initial sense impression.
The positivists replaced Hume's theory of language (which we saw originally in Locke) with a verifiability theory of meaning.
Influenced by Frege's demand for objectivity, and his rejection of idealism, the positivists demanded that expressions stand for publically observable objects.
More importantly, the positivists took the primary unit of meaningfulness to be the sentence, rather than sub-sentential expressions.
The transition from terms to sentences can be traced to Jeremy Bentham, in the late eighteenth and early nineteenth centuries; see Quine's "Five Milestone's of Empiricism," in his *Theories and Things.*
We saw the emphasis on sentences in Frege's context principle: "never to ask for the meaning of a word in isolation, but only in the context of a proposition" (*Grundlagen*, p x).
One could describe the positivists as combining Frege's logical tools with Hume's empiricist principles.

The positivist's verification theory says that for a sentence to be meaningful, it must be verifiable, in some sense.
Any sentence which is unverifiable, like any of the examples A-G above, is meaningless.
The positivists welcomed scientifically legitimate (i.e. verifiable) reformulations of philosophical problems.
For example, Newton and Leibniz had argued over the question of whether space were relational or absolute; see the Leibniz-Clarke correspondence.
This debate persisted through Kant's defense of the absoluteness of space, and it appeared essentially metaphysical.
The positivists were able to interpret the question so that it had empirical, scientific meaning.

An early influence on positivism, the scientist and philosopher Ernst Mach, had argued against absolute space on positivist principles.

> No one is competent to predicate things about absolute space and absolute motion; they are pure things of thought, pure mental constructs, that cannot be produced in experience. All our principles of mechanics are...experimental knowledge concerning the relative positions and motions of bodies... No one is warranted in extending these principles beyond the boundaries of experience. In fact, such an extension is meaningless, as no one possesses the requisite knowledge to make use of it. (Mach, *Science of Mechanics*, 280; cited in William Craig, *Time and the Metaphysics of Reality*, p 124)

Einstein's theory of relativity provided evidence for the relativity of space to an inertial frame of reference.
The theory made testable and verifiable claims, which allowed the positivists to transform the old, metaphysical debate into a legitimate, scientific one, decided in favor of relational space.

While some metaphysical questions could be re-cast as scientific ones, the positivists believed that many philosophical problems, like the problem of free will, could be dissolved, rather than solved.
The challenge for the positivists was to clarify what it meant to verify a sentence.

III. Is verificationism circular?

I mentioned that the positivists held that for a sentence to be meaningful, it had to be verifiable, in some sense.
Explaining the "in some sense" clause turned out to be trickier that the young Ayer imagined.
The readings from Ayer and Hempel mainly consist of attempts to explicate the notion of verifiability in order to capture the positivists' intent.
By the end of the Hempel article, it is clear that the positivist's project faces serious difficulties.
The death blow for positivism was Quine's article, "Two Dogmas of Empiricism," which we will read next.
But, you can see the seeds of Quine's argument at the end of Hempel's paper.

A prima facie problem with the verifiability theory of meaning is that it seems incoherent.
The theory claims that a proposition (or sentence or statement) is meaningless unless it is verified.
To know whether the statement is verifiable, we need to know what it means.
For example, few of us know whether 2 is verifiable.

> 2. Kichwa chake kikubwa.

If we know that 2 means that the meaning of life is 42, we can claim that it is not verifiable.
If we know that 2 is Swahili for:

> 3. His head is big.

then we can claim that it is verifiable.
Recall Alice's confusion on first hearing "Jabberwocky."
After Humpty Dumpty explained that 'slithy' referred to things that were lithe and slimy, Alice could

verify whether any toves are in fact slithy.
But, until she knew the meaning of the terms, she could not know whether the sentences in which they occurred were verifiable or not.
If we know what a proposition (or sentence or statement) means before we verify it, then verificationism is not doing any semantic work.

Thus, there seems to be a difference between real nonsense (gibberish) and metaphysical claims.
Metaphysical claims can be grammatical, and composed of terms which otherwise might refer.

Ayer accepts that there are grammatical sentences that can be used to make metaphysical statements.
But, he claims that only some statements express meaningful propositions.
Then, the positivist's semantic theory will apply to propositions.
Of course, Ayer's conception of a proposition was different from Frege's third-realm conception.
Hempel just discusses sentences, which is consistent with his understanding of the status of un-interpreted theories; see pp 55-6.
We can discuss the topic of sentences and proposition more in class.

IV. Positivism and the analytic/synthetic distinction

Ayer started with the following formulation of the verification theory of meaning:

> 3. A statement has meaning iff the proposition it expresses is either analytic or empirically verifiable.

(Actually, Ayer uses the phrase 'literal meaning', which we will ignore.)
Note that 3 provides two ways for a statement to be meaningful.
Meaningful statements are either analytic or empirically verifiable.

While empirical verifiability is, strictly speaking, an epistemic concept, the core distinction Ayer is making is between analytic statements, which are verifiable strictly by logical analysis, and synthetic statements, which are verifiable empirically.

Just as Hume had allowed that relations of ideas were legitimate, the positivists ascribed meaning to analytic statements.
A statement is analytic if the concept of the attribute is contained in the concept of the subject.
Thus,

> 4. Bachelors are unmarried.

is analytic because the concept of the bachelor contains the concept of being unmarried.
Among the analytic statements were truths of logic and mathematics which were essential to the construction of scientific theory.
Here, the positivists followed Frege and Russell in their claim that mathematical truths were analytic, against Kant, who claimed that mathematics was synthetic a priori.
Kant was one of the early targets of the positivists, who especially derided his claims about mathematics.
(In fact, Frege agreed with Kant that geometry was synthetic, but we will ignore geometry.)
Mathematics and logic, according to the positivists, were justifiable strictly by the same methods of

analysis which yield the analyticity of 4.

There are ways to define 'analyticity' which do not refer to conceptual containment; we will look at them when we get to Quine.
Even using containment, there are different interpretations of the term.
Kant's version of containment is called (by Frege) beams-in-the-house containment.
Frege contrasts Kant's version with his own 'plant-in-the-seed' version.
For Frege, if one statement follows by purely logical principles (a proof) from another, then the entailment is analytic.
Frege and Russell argued that mathematics was analytic, since it could be derived from pure logic.
Frege and Russell were wrong about the reducibility of mathematics to logic.
Arithmetic can be reduced to logic and set theory, but not to logic itself.
Still, the positivists maintained the Fregean doctrine of the analyticity of mathematics.

Empirical scientific claims, according to 3, were justifiable by the completely different methods of observation.
Consider:

> 5. Bachelors are unhappy.

A standard interpretation of 5 is that it is synthetic since the concept of a bachelor does not contain (either in a plant-in-the-seed way or in a beams-in-the-house way) the concept of unhappiness.
The positivists added to the standard interpretation the claim that the meaning of 5 consists in the way that we would verify, or test, the unhappiness of bachelors.

The positivists' sharp distinction between analytic statements and synthetic ones will turn out to be their Achilles' heel.
Hempel noticed the problem.

> Whether it is possible to make a sharp theoretical distinction between logical and extra-logical terms is a controversial issue related to the problem of discriminating between analytic and synthetic sentences (Hempel, 61, fn 9).

We will return to the analytic/synthetic distinction.
For the purposes of understanding the problems of the verifiability theory of meaning, we need only consider the second disjunct in the right side of 3.
That is, I will put aside questions about the method of analysis.

V. Refining the verification principle

We still have to determine how we verify a claim.
Ayer first proposes observation as the core of verification.

> 6. A statement is verifiable if some possible sense-experience would be relevant to the determination of it truth or falsehood (Ayer, 11).

But, he rejects 6 because it begs the question of how a sense-experience is relevant to a determination of

truth.

Ayer neglects the difficulties with 'possible in 6.
Does it, for example, exclude or include the sense experiences of creatures with different sensory apparatuses from ours?
If we include the sense experiences of Martians, or other aliens, or robots, then we may never know whether a statement is verifiable.
If we only include our sense experiences, then meaningfulness become chauvinistic.
Chauvinism is unacceptable as the basis for scientific theory.
We want science to cut nature at its joints, not our joints.
Either interpretation of 'possible' in 6 is undesirable.

In lieu of 6, Ayer proposes:

> 7. A statement is verifiable, and consequently meaningful, if some observation-statement can be deduced from it in conjunction with certain other premises, without being deducible from those other premises alone (ibid).

The idea behind 7 is that a claim with empirical content will have some observable consequences.
Claims without empirical content will have no observable consequences.

Hempel provides an alternate version of 7:

> 7'. A sentence has empirical meaning iff it is not analytic and follows logically from some finite and logically consistent class of observation sentences (Hempel, 51).

Hempel's allusion to logically consistent sets of sentences is otiose, since any sentence follows from an inconsistent set.
The fact that any sentence follows from a contradiction in classical logic is what logicians call explosion.
One may reasonably expect scientific theories to be consistent.
If they turn out to be inconsistent, we reject them.

Note Hempel's allusion to finite sets.
While any empirical theory is likely to have a finite set of laws, as its axioms, scientific theories are generally couched within mathematical theories.
As Galileo wrote, approximately, the book of nature is written in the language of mathematics.
Mathematical theories strong enough for scientific purposes are not finitely axiomatizable.
(And that's another paper topic.)

The core element of bot 7 and 7' is the explanation of verifiability in terms of observation statements.
Hempel provides a more specific characterization of an observation sentence:

> An *observation sentence* might be construed as a sentence - no matter whether true or false - which asserts or denies that a specified object, or group of objects, of macroscopic size has a particular *observable characteristic*, i.e. a characteristic whose presence or absence can, under favorable circumstances, be ascertained by direct observation (Hempel, 51)

Looking at the component parts of observation sentences,

> We shall understand by an *observation term* any term which either (a) is an observation predicate, i.e. signifies some observable characteristic (as do the terms 'blue', 'warm', 'soft', 'coincident with', 'of greater apparent brightness than') or (b) names some physical object of macroscopic size (as do the terms 'the needle of this instrument', 'the Moon', 'Krakatoa volcano', 'Greenwich, England', 'Julius Caesar') (Hempel, 53).

According to 7 and 7', the positivists wanted to reduce all synthetic statements to statements whose terms refer to macroscopic objects and properties.
Note that the positivists were working in what were still the early days of atomic theory.
According to positivism, claims about molecules, atoms, and sub-atomic particles (e.g. quarks), if they were to be meaningful, would have to be translated into observational terms.
Such translations would involve, as legitimate terms, references to microscopes, ohmmeters, and other devices for measuring unobservable properties or events.
Translations could also refer to personal sense data.
Notice the affinity to Russell's translations of statements including names or definite descriptions to statements involving logically proper names; I smell a term paper.

Both 7 and 7' seem to do the work that the positivists want from it.
For example, according to 7, claim C, from §I of these notes, is unverifiable because there are no observable consequences to the claim that the world was created five minutes ago
It is part of C that all the observable evidence is exactly the same as it would be if the world had existed from eternity.

Still, the observability clause quickly runs into an obvious difficulty.
There are some claims which are completely legitimate, according to the spirit of positivism, but whose truth is unobservable.
For example, Socrates certainly had a blood type.
But, there is no way for us to observe what his blood type was.

We might ascribe to the positivists the claim that meaningful statements must be verifiable, not in fact, but in principle, as a friendly amendment.
We could, in principle, verify Socrates' blood type.
We could not, in principle, verify whether the Absolute is lazy, or whether the world was created five minutes ago with all its historical remnants and memories in place.

> It [is] characteristic of the metaphysician, in my somewhat pejorative sense of the term, not only that his statements do not describe anything that is capable, even in principle, of being observed, but also that no dictionary is provided by means of which they can be transformed into statements that are directly or indirectly verifiable (Ayer, 14).

So, we arrive at the claim that a factual (or empirical) statement is meaningful if it is, in some way, under some principle, connected to observation.
Unfortunately, with friendly amendments like this, the positivists need no critics.
The proposed amendment of 'in-principle observation' leads to positivist right back into the chauvinism of possible sense experience I discussed at the beginning of this section.

Even if we were to solve the in-principle/possible observation problem, both 7 and 7' still run into some difficulties.

Ayer points out that given the right other premises, a meaningless metaphysical statement can logically entail meaningful statements.
He provides the following example, in which 'S' can stand for any statement, including a meaningless one, and 'O' stands for a fully legitimate observation statement:

8. If S then O
S
Therefore O.

8 is an obvious counter-example to either 7 or 7'.
The intent behind 7 and 7' was that if you had legitimate premises, you would not be able to derive meaningless conclusions.
8 shows that 7 and 7' do not provide both necessary and sufficient conditions for meaningfulness.
Still, a system of meaningful statements will only entail other meaningful statement.
So, 7 and 7', combined with the right premises, might be promising explications of the principle of verification.

Unfortunately, as Hempel points out, 7' renders all universal laws meaningless.
Universal laws do not follow deductively from any finite set of observation sentences.
And, universal laws are the backbone of science.
If the positivists want anything, it is to vindicate empirical science.

Hempel points out another, intractable difficulty.
It seems reasonable to believe, and the positivists did, that a statement is meaningless, if, and only if its negation is meaningless.
But, the negation of every existential claim is a universal one.
Consider:

9. There are balls of uranium greater than a mile in diameter.
9'. $(\exists x)(Bx \bullet Ux \bullet Hx)$

The negations of 9 and 9' are:

10. There are no balls of uranium greater than a mile in diameter.
10'. $(x)[(Bx \bullet Ux) \supset \sim Hx]$

9 and 9' seem positivistically legitimate, even if they are false, referring only to macroscopically observable objects.
But, 10 and 10' are impossible to derive from a finite set of observations, directly.
Thus, 10 and 10' should be meaningless.
So, while universal claims seem meaningless, their negations seem meaningful, violating this criterion.

Just as universal claims are not derivable from any finite set of observation sentences, dispositional terms are not reducible to observational terms.
For example, we can define fragility in terms of what would happen if an object were struck.
Thus, Brad Pitt is fragile if he would break if he were struck.
But, if Brad Pitt is never struck (they have stunt men for this sort of thing), he would automatically be categorized as fragile, since the conditional 'if he were struck, he would break' would be vacuously true.

The problem of how to verify a universal statement is related to the difficulty Ayer mentions with strong verifiability.
Ayer claimed that a statement is strongly verifiable if it could be conclusively established; it is weakly verifiable if it is rendered probable by verificationist means (whatever they turn out to be), p 9.
In retrospect, he realized that no empirical claim is ever conclusively established, since, again, no finite set of observations suffices to establish a universal generalization.
Thus, his strong/weak distinction collapses; all verification is weak, in his original sense.

We have seen difficulties with both 6 and 7/7' as attempts to explain the verifiability theory of meaning.
Both Hempel and Ayer discuss a completely different tactic.
One might define meaningfulness in terms of falsifiability.
This suggestion derives from Karl Popper, a contemporary of the positivists, but not a member of the group.
Popper thought that the difference between real science and pseudo-science was that real sciences were falsifiable, and pseudo-sciences admitted of no falsification.
His main concerns were to show that Marxism and Freudianism were pseudo-sciences.
Thus, he had concerns which were consistent with the positivists' desire to eliminate claims A-G.
Popper's work is interesting, but too far away from philosophy of language and into philosophy of science for our purposes.
Plus, this section has gone on way too long, already.
See Popper's excellent *Conjectures and Refutations*, if you are interested in falsifiability.

In the end, Ayer settles for a distinction between indirect and direct verification.
Directly verifiable statements are those which either are observation-statements or, in conjunction with other observation-statements, entail other observation statements which are not deducible from the original ones alone.
What counts as an observation statement is left as an open question.
Ayer eliminates counter-examples like 8 by requiring that all statements involved in the deduction are observation-statements.
Indirectly verifiable statements are, similarly, those which entail directly verifiable statements, in conjunction with other kosher statements.
And all meaningful statements are either analytic, or directly or indirectly verifiable.

VI. The end of foundationalism

The core idea of the principle of verification is that all our legitimate claims are traceable to a core set of claims which refer only to things or events that we can experience.

> There is a class of empirical propositions of which it is permissible to say that they can be verified conclusively. It is characteristic of these propositions, which I have elsewhere called "basic propositions," that they refer solely to the content of a single experience, and what may be said to verify them conclusively is the occurrence of the experience to which they uniquely refer... Propositions of this kind are "incorrigible,"...[in that] it is impossible to be mistaken about them except in a verbal sense (Ayer, 10).

Notice the foundationalism implicit in Ayer's statement.
The claim is that all of science (and philosophy) can be founded on the basis of observation statements in

conjunction with the logical and mathematical principles used to regiment and derive those observations.
Claims that are not observable may be derived from the axiomatic observations, or introduced by definition.
But, all and only meaningful statements will be analytic, observable, or derivable from observable axioms.

Positivism was the last, foundationalist theory.
Quine's holism, which we will examine next, devastated the project.
Quine's argument attacks the fundamental presupposition of positivism that one can make a clear distinction between an observation statement and an analytic one.
The worries about isolating observation statements, though, are already present in Hempel's article.

> In the language of science, and for similar reasons even in prescientific discourse, a single statement usually has no experiential implications. A single sentence in a scientific theory does not, as a rule, entail any observations sentences; consequences asserting the occurrence of certain observable phenomena can be derived from it only by conjoining it with a set of other, subsidiary, hypotheses (Hempel, 56).

Hempel thus claims that the meaning of a single expression is "elliptical", incomplete on its own.
It requires, for its meaning, reference to an entire linguistic framework, a theoretical context which forms the background to that expression.

> If, therefore, cognitive significance can be attributed to anything, then only to entire theoretical systems formulated in a language with a well-determined structure (Hempel, 57).

Hempel thus alludes to what has come to be known as semantic holism.
Quine's arguments against positivism and the verifiability theory of meaning, and his arguments for semantic holism are next.