Chapter 3
Epistemology and Logical Positivism

Logic positivism is dead, or as dead as a philosophical movement ever becomes—John Passamore (1967).

Epistemology

I start this chapter with a brief introduction to contemporary epistemology. *Epistemology* is the philosophical study of knowledge—more specifically, the questions of "What is knowledge?"; "Is knowledge even possible?"; (also known as the *skeptical* question)—and "How does knowledge grow?" being some of the central problems of epistemology. In most contemporary views, epistemology and the philosophy of science are highly interrelated because science attempts to produce knowledge—and for many, it has shown an unique ability to produce knowledge. Thus, some have said (e.g., Quine 1969) that the epistemologist ought to focus their study on the sciences in order to make optimal progress on their questions about knowledge. Interestingly, for our purposes, Quine (1969) said something more specific:

> Epistemology … simply falls into place as a chapter of psychology and hence of natural science. It studies a natural phenomenon, viz., a physical human subject. This human subject is accorded a certain experimentally controlled input—certain patterns of irradiation in assorted frequencies, for instance—and in the fullness of time the subject delivers as output a description of the three-dimensional external world and its history (pp. 82, 83).

Quine thought ultimately that psychology (specifically the psychology of perception and learning) would answer the questions of epistemology! Quine recommended this "naturalized" epistemology as a replacement for the more traditional position of epistemology as a "first philosophy" in terms of which all our knowledge of the world must ultimately be grounded. The traditional view is that the first task of the philosopher is to resolve epistemological questions—because questions about knowing are basic to any other philosophical questions. The philosopher must have an account of knowledge before they move on to knowledge claims about ethics or political philosophy, for example. For Quine, on the other hand, there is nothing more fundamental than the knowledge-generating processes of the natural sciences themselves; accordingly, abandoning the foundationalist philosophical project ought to allow us to replace traditional philosophical

W. O'Donohue, *Clinical Psychology and the Philosophy of Science*,
DOI: 10.1007/978-3-319-00185-2_3,

questions about justification with purely empirical questions about the causal route from stimulus to belief and its expression.

But this is bit of a preview—*naturalized, evolutionary epistemology* will be discussed in detail in the next chapter on Popper as Popper and his students did much to develop this account. First, since we mentioned the traditional epistemological view, let us describe it a bit.

Epistemology 101

Since Plato, philosophers have generally accepted that knowledge is *justified, true,* and a *belief.* Roughly, the argument is that asserting "Sally knows *p*" (where *p* can be replaced by any proposition) forces one, in order to be consistent, to also assert that:

1. That Sally believes *p* (It is logically contradictory to say Sally *knows* that $2 + 2 = 4$, but Sally does not *believe* it);
2. That *p* is true (One cannot *know* a false statement); and
3. That Sally's belief in *p* is *justified* (Sally may correctly believe that 5,893 will be the winning lottery number, that is, she may hold this true belief and therefore meet the first two conditions, but this lucky guess is not a case of knowledge because there were no grounds, good reasons, or arguments for this true belief).

Thus, knowledge has been traditionally regarded as a type of belief that differs from other kinds of belief in that it is true, and it is justified. Traditional epistemology is concerned with the evaluation and construction of methods by which we may arrive at clear cases of knowledge, for example absolutely certain knowledge (Descartes 2010). Implicit in this account is the suspicion that our normal, everyday conception of knowledge is too vague and unrefined—a view that often precedes a philosopher's more careful and detailed conceptual analysis. Our everyday notions of knowledge are generally too lenient—these let in too much belief that is not true and/or not justified.

Further, according to Plato, opinion changes, while knowledge remains constant. Another essential feature of traditional theories of epistemology is their *normativity*: To know is to meet certain epistemic *norms* (e.g., proper justification and proper standards regarding truth), and mere belief always fails to do so. Traditional epistemology was—and for some thinkers continues to be—a discussion of how one *ought* to reason in order to arrive at knowledge, rather than how one in fact does reason.

Plato's (1997) original theory (knowledge = justified true belief), outlined in his dialogues the *Theatetus* and the *Meno,* has been modified by subsequent philosophers (see e.g., Ayer 1952) in an attempt to address the problems associated with articulating adequate theories of justification, truth, and belief. In order for the traditional approach to epistemology to accurately account for knowledge, these problems must be solved.

Justification

What precisely does it mean for a claim to be "justified?" Justification is a matter of the degree to which one can support a knowledge claim with some sort of warrant or evidence, such as citing sensory evidence or a deductive argument. A mere belief, even if it happens to be true, will not count as knowledge unless it has been properly justified. For example, the belief that "Client X suffers from depression" without any supporting evidence (e.g., scores on the BDI-II, observed feelings of helplessness and worthlessness, etc…) amounts to a mere belief, hunch, guess, or opinion—but not knowledge. Supporting this claim with further observational claims such as valid assessment results creates (at least partial) justification for the claim. According to this formulation, a true belief without justification is just that a true belief that falls short of knowledge.

Truth

What exactly is "truth?" Two major theories of truth have been articulated within the framework of traditional epistemology: *the correspondence theory of truth* and *the coherence theory of truth*. Before discussing these opposing theories, it is important to understand how philosophers have treated the topic of truth in general. Truth is a property of propositions (e.g., statements, sentences, beliefs), **not** of objects in the world. As such, it makes sense to say that the statement, "The cat is on the mat" is true (if the cat is, in fact, on the mat), but the cat and the mat and their relation to one another *qua* objects in the world are just a brute fact (neither true nor false).

Correspondence Theory of Truth

In this view, truth is a property of propositions that accurately reflect (correspond to) reality. When a belief accurately depicts reality (e.g., "The cat is on the mat" when, in fact, the cat is on the mat), then the statement is said to be true. The correspondence theory of truth further assumes that insofar as the natural sciences rest on sensory evidence, we should be able to develop a language that accurately captures and faithfully transmits the observed structure of reality (e.g., the cat on the mat). The more exacting our language is with respect to reporting our observations, the deeper and more accurate our explanation of the natural world is Precision, clarity, and rigor, regarding both observation and language, according to these thinkers, will eventually generate epistemic certainty. Many, namely the sense-data theorists such as Russell (1985) and, as we shall see, the logical positivists such as Carnap (2003), attempted to construct such fine-grained ideal sensory languages that translated perceptual experiences into language without losing objectivity or accuracy.

Coherence Theory of Truth

The coherence theory of truth suggests that the truth of any given proposition is generated by its logical "agreement" (or fit) with a set of other relevant beliefs. The belief "Zinc dissolves in acid" is true according to this account because this belief agrees or "fits" with the set of beliefs having to do with elements, their properties, chemical interactions, statements that describe observations, and so on. Likewise, each member of the set of beliefs having to do with the elements (to which the original belief was compared) is also true (or false) by virtue of their logical agreement (or lack thereof) with other statements. Coherence theorists view knowledge as a belief network that logically supports itself and, in doing so, generates truth. There is no requirement for such belief networks to correspond to any objective reality because such a reality, in this view, is ultimately unknowable.

Correspondence theories are criticized due to difficulties in understanding the relationship between raw percepts and language. However, individuals do generate observational sentences, and it is critical in this account that these observational sentences cohere with—but not correspond to—all other relevant claims. For example, the observational claim "I just saw zinc fail to dissolve in acid" does not logically cohere with the universal claims "All zinc dissolves in acid."

Problems with the Traditional Account of Knowledge

Problems with Justification

Justification can be an ambiguous and slippery requirement. Some may treat justification as identical to that which is reasonable, acceptable, or personally believable (e.g., "That is a justified belief"). This is a problem because that which is reasonable, acceptable, or personally believable varies from individual to individual—probably because individuals use a wide variety of standards of evidence. The most difficult feature of the justification requirement has been referred to as the "regress problem" (BonJour 1985). The regress problem is the result of foundationalist attempts to justify beliefs. Foundationalism, as Alston (1976) characterizes it, is the thesis that:

> Our justified beliefs form a structure, in that some beliefs (the foundations) are justified by something other than their relation to other justified beliefs; beliefs that are justified by their relation to other beliefs all depend for their justification on the foundations (p. 165).

Stated more simply, a person might argue that, "My belief that my car is parked in the driveway is (partially) justified by my belief that I left my car there last night. The latter belief is justified, in turn, by my belief in the general veracity of my memory. I can further justify my belief by taking the steps necessary to empirically verify the location of my car (e.g., I can look and thus create observational statements). Having seen my car in the driveway, I can further justify my belief that it is there by

appealing to certain basic assumptions regarding the veracity of sense perception. In the end, my justificatory trail will lead to an infallible belief (i.e., its foundation)."

Unfortunately, the foundationalist assumption leads to an infinite regress (or what Bartley (1999) called "a retreat to commitment"—faith). According to the foundationalist, each foundational belief is of the sort that it is self-evident and in need of no justification. Foundational, or basic, beliefs are considered self-justifying. Are there really any such beliefs? What kinds of beliefs would count? Descartes (2010) proposed his "cogito ergo sum" as an example of a self-justifying belief. The "cogito" ("I think, therefore I am") was thought to be self-justifying because, as Descartes believed, one could not possibly think the contrary and any attempt to do so inevitably reaffirmed the very statement. That is, a person's thinking simply guarantees the truth of the claim. Descartes' foundation, however, has not proved to be as sturdy as he had hoped.

Problems with Truth Criteria

Both the correspondence and coherence theories of truth fail. The correspondence theory of truth presupposes our ability to (1) engage in "raw" unbiased observation of the world and (2) translate these raw perceptions into a meaningful scientific language. Empirical literature regarding perception clearly indicates that we have no such privileged access to raw sense data (Pashler and Yantis 2004). The logical positivist's goal of constructing an ideal sensory language for the sciences failed as well (Smith 1986). Furthermore, Munz (1985) argued that evolution entails that our perceptions never "represent" the environment but rather are "tolerated" by the environment because of their "truth likeness." (However, interestingly for Munz, their existence ensures that something in fact is beyond our perceptions.) He stated:

> Nobody it seems stopped to think about the biological basis of perception and the phenomenon of adaptation. Everybody seemed content with the idea that mankind had evolved to the point of Enlightenment at which one simply knew that observation was a good guideline and infinitely better than any other source of information. 'We should consider ourselves lucky to have eyes to see light' everybody was saying, 'and not frivolously throw such a gift to the winds and give credence to intuition, authority, tradition or reason.' It never occurred to anybody that there was a very good reason, given the existence of light, why we had eyes and an equally good reason why we should prefer the testimony of our eyes to that of authority or revelation. Instead all people worried about was whether what they saw was what there was or whether it was an appearance and if an appearance, whether there was a reality behind it and if so, whether that reality was likely to be significantly different, etc., etc. The thought that the presence of the eye was guarantee of the presence of light, that light had selected organisms with eyes for survival, and that may be reason why we should go by our eyes rather than by revelation never seems to have crossed anybody's mind! (p. 10).

The correspondence theory of truth has been abandoned by most epistemologists for these, and other, reasons.

A simple, yet definitive, argument against the coherence theory of truth was formulated by the logical positivist, Schlick (1973):

> If one is to take coherence seriously as a general criterion of truth, then one must consider arbitrary fairy stories to be as true as a historical report, or as statements in a

> textbook of chemistry, provided the story is constructed in such a way that no contradiction ever arises. I can depict by help of fantasy a grotesque world full of bizarre adventures: the coherence philosopher must believe in the truth of my account provided only I take care of the mutual compatibility of my statements, and also take the precaution of avoiding any collision with the usual description of the world, by placing the scene of my story on a distant star, where no observation is possible. Indeed, strictly speaking, I don't even require this precaution; I can just as well demand that the others have to adapt themselves to my description; and not the other way around. They cannot then object that, say, this happening runs counter to the observations, for according to the coherence theory there is no question of observations, but only of the compatibility of statements (p. 419).

Problems with Belief and Skepticism

The *skeptical* question "Is knowledge even possible?" has been answered in many ways. Given the potentially strict interpretation of the doctrine of justified true belief, some philosophers have maintained a skeptical stance regarding the very possibility of knowledge. Such philosophers have claimed that knowledge is not possible (e.g., the skeptics of ancient Greece). Descartes (2010) is famous for claiming that one should doubt everything that cannot be known with absolute certainty. The scientific method was initially considered a corrective to the skeptical argument because it promised to reduce typical human errors of reasoning and, most importantly, provide a pathway to rigorous knowledge. However, the promise of science to overcome the skeptic's argument has not come to pass as science is generally seen as fallible and even subject to revolutionary revisions of claims previously taken to be justified and true.

A problem with skeptical arguments is that the skeptic refuses to acknowledge the fact that humans do possess knowledge. A survival advantage is possessed by the creatures with cognitive faculties that are lacking in creatures without them. Kitcher (1992) puts it this way: "If our initial cognitive equipment were as unfortunate as the skeptic portrays it as being, then, the suggestion runs, our ancestors would have been eliminated by natural selection. They were not, so it was not" (p. 91).

The skeptic also takes issue with assuming knowledge (e.g., scientific findings) in order to explain the possibility of knowledge. Kitcher (1992) responds to this skeptical concern as well:

> One complaint against the appeal to Darwin is rightly dismissed. If skeptics protest that a part of contemporary science is being taken for granted in evaluating aspects of the historical process out of which science emerged, the appropriate naturalist reply is, "Of course. What else?" As I hope to have made clear, a central naturalist thesis is that some parts of our current scientific beliefs must be assumed in criticizing or endorsing others (p. 91).

The skeptic has overstated our shortcomings as cognitive agents and created pseudo-problems regarding knowledge that are easily resolved. The evolutionary epistemologist resolves the skeptical question "Is knowledge even possible?" by refusing to entertain it as a legitimate problem. We have concerned ourselves with the mere possibility of knowledge for too long, thus ignoring the obvious fact that

we do, in fact, possess knowledge. The demand for certainty in knowledge inevitably results in skepticism because certainty is beyond our reach.

Thus, the characterization of knowledge as justified true belief runs into problems typical of any analytical definition, namely the question is shifted from "What is knowledge?" to questions regarding the alleged constituent properties. What is meant by "justified"—*apodicticity* (self-evidently true—e.g., "x = x"?); consistency with *all* possible tests?; consistency with a certain subset (how many?) of all possible tests, that is, all conducted tests?; more consistent with these tests than not?; more supporting evidence than known rivals?; or something else? What exactly is supporting evidence? What is "truth"—correspondence with the facts?; coherence with other beliefs?; pragmatically useful beliefs?; or something else? And finally, there are questions about the third alleged property—what is "belief?"—any percept such as "red, now"?; a proposition that I am immediately conscious of, as in "I am now typing"?; something that may be more dispositional, such as the background belief, "Antarctica is cold"?; or something else? For the past 2,000 years, epistemologists have attempted to provide a satisfactory account of knowledge by supplying acceptable accounts of "justification," "truth," and "belief."

Gettier Cases

Moreover, Gettier (1963) in an important and revolutionary paper "Is justified true belief knowledge?" suggested that there are cases in which justified true belief is not knowledge, and therefore, the traditional analysis needs to be revised. These examples have come to be known as "Gettier counterexamples." The following is an example. Suppose one night you see a man leave a bar, then he is staggering, weaving when he walks, and singing in a slurred manner. You see him take a long drink out of what appears to be a bottle in a brown paper bag. You see him weave to his car and drop his keys several times. Finally, he enters his car, and he drives away in an erratic manner. You conclude: "There is at least one drunk driver on the road tonight." Let us call this as proposition *p*. Moreover, let us further suppose the following: (1) that the man you saw was not in fact drunk (he was drinking water from the bottle in the bag). Rather, he suffers from a neurological problem that affected his coordination and speech; and (2) that although you are ignorant of this fact that at approximately the same time an intoxicated individual left another bar and began driving while drunk.

Now the question becomes, do you actually know *p*? Two conditions for knowledge are clearly met: (1) *P* is true (due to the second individual) and (2) you believe *p*. It also seems that you are justified in believing *p*, because normally witnessing such evidence (someone exiting from a bar, slurred speech, abnormal gait, coordination problems, drinking from a brown paper bag, erratic driving) conjointly are excellent grounds for believing *p*. However, the Gettier counterexamples are designed to show that justified true belief are not sufficient conditions for knowledge. For example, the claim would be that you do not know *p* because your justification for knowing *p* is based on a false premise, namely that the man you saw is the drunk driver.

Responding to the Gettier counterexamples has consumed a lot of time and energy in contemporary epistemology. One response that has a fair number of adherents is that the Gettier counterexamples demonstrate a need for a fourth condition for knowledge. One such proposed condition is the following:

> There is no true proposition *Q* such that if *Q* were added to the individual's beliefs then he would no longer be justified in believing *p*.

*Q*s are known as "defeaters," and such analyses have come to be called *defeasibility analyses*. The defeater in our example is, "The man I saw is not a drunk driver."

We end our brief exposition of some of the major moves in epistemology and turn now to an explication of the first major account of science: logical positivism. These epistemological problems though serve as an important context and background for this discussion.

Logical Positivism

Historical Sketch

Logical positivism began as a philosophical movement in the 1920s as a strong reaction to idealist *metaphysics*. Its geographical origins were both in Berlin (the Berlin circle) and in Vienna (the Vienna circle). Some of the major names in this movement were Rudolf Carnap, Moritz Schlick, Carl Hempel, Hans Reichenbach, and A.J. Ayer. Logical positivists were also heavily influenced by the physicist/philosopher Ernst Mach and the philosopher Ludwig Wittgenstein. Many of the logical positivists were Jewish, and with the rise of Hitler in Germany and the beginning of World War II, many of these individuals emigrated to the English-speaking world—particularly to the United States and England.

Philosophical Background

Idealistic Metaphysics

In the nineteenth century, there were a number of philosophers who wrote on what is commonly called metaphysics. *Metaphysics* is sometimes defined as the branch of philosophy attempting to study the fundamental nature of being and the world. It attempts to ask, what *kinds* of things exist—for example do abstractions such as "red" exist or do only concrete red things exist? What kind of thing is "redness" or "threeness" and how do these sorts of things differ from a particular instantiation—say as specific red wagons and red apples? Do Gods exist? How about other minds? If we were to take an inventory of all that exists—what *kinds* of things would be found?

However, some of the writings of these philosophers were a bit obtuse. Heidegger (1959) infamously claimed, "the nothing nothings." Other metaphysicians stated things like "Spirit is the principle of the world" or "God is tripartite"

(note that a large part of religion is, on this definition, metaphysics. Part of the controversy regarding logical positivism is its dismissal of religious claims as meaningless).

A question can arise—"Is the claim that the Nothing nothings, true or false?"; "Is God tripartite or not?"; the logical positivists claimed, however, that there is a prior question to questions of truth and falsity. Truth and falsity are properties only of *meaningful* indicative sentences. Meaningless sentences are neither true nor false—they are simply *meaningless*. If I claim "Green ideas sleep furiously," it is nonsense for you to say that this claim is true and equally nonsensical for you to say that this claim is false. The only proper reaction is for you to say: "Your utterance is meaningless!" The positivists thought many philosophical problems were due to "language gone on holiday." Or to use (Wittgenstein's 1967) colorful phrase, "Philosophy is a battle against the bewitchment of our intelligence by means of language." The positivists claimed that we do not have to spend a lot of time trying to figure out if the nothing nothings—because such metaphysical statements are meaningless. Their project, to use the title of one of Carnap's essays, was, "the elimination of metaphysics through the logical analysis of language."

This view that metaphysical claims are nonsense was not entirely new to them. The British empiricist David Hume (1797) had stated previously:

> When we run over libraries, persuaded of these principles, what havoc must we make? 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.

A somewhat more technical version of this notion is provided by the logical positivist Schlick (1932):

> A proposition which is such that the world remains the same whether it be true or false simply says nothing about the world; it is empty and communicates nothing; I can give it no meaning (p. 88).

Let us examine a specific application of Carnap's principle. If I assert "God is tripartite" and I want to test it for its meaningfulness, the logical positivist would have to be ask the question—"How would this make a difference to my observations of the world?" "What observations could I make if God were one versus if God were not one?" If one cannot identify any such observations, then the sentence is actually meaningless. Metaphysicians were for the positivists, "musicians without musical ability."

The Verifiability Principle

Going for even a bit more precision, according to Schlick (1932):

> A statement is meaningful if and only if it can be proved true or false, at least in principle, by means of the experience—this assertion is called the verifiability principle [aka the "verifiability criterion of meaning"]. The meaning of a statement is its method of verification;

> that is we know the meaning of a statement if we know the conditions under which the statement is true or false. When are we sure that the meaning of a question is clear? Obviously if and only if we are able to exactly describe the conditions in which it is possible to answer yes, or, respectively, the conditions in which it is necessary to answer with a no… a statement has a meaning if and only if the fact that it is true makes a verifiable difference.

He concluded:

> Metaphysical statements are not empirically verifiable and are thus forbidden: they are meaningless. The only role of philosophy is the clarification of the meaning of statements and their logical interrelationships. There is no distinct "philosophical knowledge" over and above the analytic knowledge provided by the formal disciplines of logic and mathematics and the empirical knowledge provided by the sciences. Philosophy is the activity by means of which the meaning of statements is clarified and defined Schlick (1932).

Wittgenstein

As mentioned previously, the Austrian philosopher Ludwig Wittgenstein also influenced the logical positivists. Two of Wittgenstein's most influential books are the *Tractatus Logico Philosophicus* and *Philosophical Investigations*. Interestingly, Wittgenstein's views changed dramatically, and scholars often talk about the earlier Wittgenstein of the *Tractatus* and the later Wittgenstein of *Philosophical Investigations*. The logical positivists were influenced by his earlier work. Wittgenstein saw his later work as refuting his earlier work, and in fact, many regard *Philosophical Investigations* as critical in the demise of logical positivism.

Wittgenstein wrote in aphorisms—brief (often very pregnant phrases) and part of the puzzle in Wittgenstein exegesis is both to understand each of these aphorisms and to understand the relations of these to one another. Here are key examples of his statements:

> What can be said at all can be said clearly, and what we cannot talk about we must pass over in silence.
> The limits of my language mean the limits of my world.—Wittgenstein (TLP, 5.6)
> We feel that even when all possible scientific questions have been answered, the problems of life remain completely untouched. Of course there are then no questions left, and this itself is the answer.—Wittgenstein (TLP, 6.52)
> (Whereof one cannot speak, thereon one must remain silent.)—Wittgenstein (TLP, 7)

The Analytic/Synthetic Distinction

The philosophical context of the rise of logical positivism also had to do with debates regarding legitimate sources of knowledge: between the *empiricists* (such as Locke, Berkeley, and Hume) who thought that observation was necessary and the *rationalists* who thought that reason alone could produce knowledge (such as Descartes and Leibniz). The German philosopher Immanuel Kant thought that

there was a third way. Kant was impressed with science but thought that science provided some knowledge that was so certain that it could not simply be based on observation. As examples of this knowledge, he thought Newton's laws of motion, the principle of causality (every effect has a cause), and Euclidean geometry were based on observations but had a special status in which they were certain to be true. He claimed that there was a third kind of knowledge that he called *the synthetic a priori.*

To understand this distinction, we first have to review a few other distinctions he made.

Analytic statements are true by virtue of their meaning (e.g., "All bachelors are unmarried"; "The brown dog is brown"; and "Tomorrow it will snow or it will not snow").

Synthetic statements: These are not analytic but predicate something about the world (e.g., "Tomorrow it will snow" or "President Obama is 24 years old").

The second class of distinctions is between *a priori* and *a posteriori* statements:

A priori statements: The truth of these statements can be established *without observation*. Examples include "All brothers are male" and "All squares have four sides."

A posteriori statements: The truth or falsity of these statements can only be established *with* observations. Examples include "My foot has 5 toes" and "It is snowing."

Kant's table

	A priori	*A posteriori*
Analytic	All bachelors are unmarried.	
Synthetic	Every event has a cause. 7 + 5 = 12 Euclidean geometry The law of conservation of matter Newton's laws of motion	Tomorrow it will rain.

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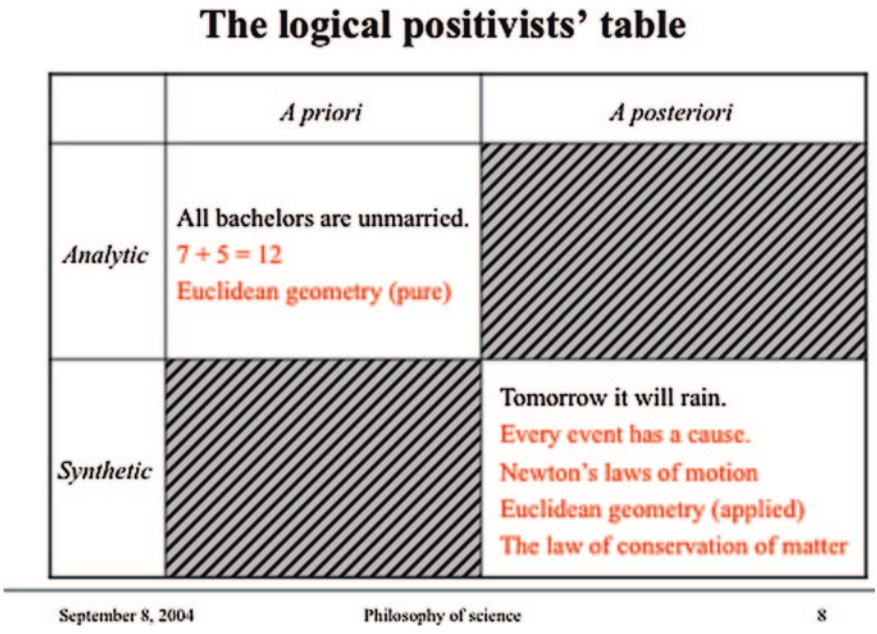
Metaphysicians were most interested in a particular combination of these categories—the *synthetic a priori*—they wanted to discover profound truths about the

world without making observations. The logical positivists essentially claimed that *there were no such things as synthetic a priori claims*—when one try to make this kind of claim, one is uttering something meaningless.



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Thus, the logical positivists claim that there are no meaningful synthetic a priori statements and hence no metaphysics. Thus, the logical positivists verifiability criterion recognized only two kinds of statements as meaningful: analytic, in which the predicate simply "unpacks" the subject ("Bachelors are unmarried"; "unmarried" is already contained in the subject"), and synthetic statements, that is, observations about the world.

Problems with the Verifiability Criterion

To the credit of logical positivists, they would criticize their own views—particularly the adequacy of the verifiability criterion and attempt to respond to these criticisms by improving it. Here are some of the major criticisms:

1. The verifiability criterion judges some canonical scientific statements to be meaningless. For example, scientific laws seem to become meaningless according to the verifiability criterion. Take the scientific law, "All copper conducts electricity." However, one can never observe *all* copper; hence, one cannot build this statement from observational reports. Hence, according to the verifiability criterion, it is meaningless.

2. The verifiability criterion when applied to itself is judged meaningless. The verifiability criterion itself is neither analytic nor a product of observations. Thus, the core regulative statement relied upon by the logical positivists is actually meaningless! And if the logical positivists allow themselves some meaningless statements, why cannot others—such as the religious?
3. There seems to be no valid inductive logic—no set of valid inference rules which allow observations to entail a larger (*ampliative*) statement such as a scientific law. No number of observed white swans allows one to validly deduce that "All swans are white." (More about this in the next chapter.)
4. The logical positivists needed an account of how perception—taken to be non-propositional—for example the experience of the raw percept of red—can be translated into linguistic terms without error, to form the observations sentences they needed to "support" theoretical sentences and scientific laws.
5. Quine (1951) in his classic, "The Two Dogmas of Empiricism" argued the former point but also argued that the analytic and synthetic distinction was not as clear as the logical positivists needed. Quine argued that the analytic/synthetic distinction was circular. Part of the problem was it relies on an unclear notion of "synonymy" because it relies upon replacing terms like bachelor with terms like "unmarried."
6. Other statements which we take to be meaningful, such as "Genocide is morally wrong," also become meaningless. Let us examine this a bit.

Ethics and Moore's Is/Ought Distinction

What about ethical statements such as "Lying is morally wrong." Are these meaningful according to the logical positivist? Are these analytic statements or verifiable by empirical observations? First, the logical positivists were influenced by Hume's *Is/Ought Distinction* and G.E. Moore's *the naturalistic fallacy*.

The Is/Ought Distinction

Hume's stated (1737):

> In every system of morality, which I have hitherto met with, I have always remarked, that the author proceeds for some time in the ordinary ways of reasoning, and establishes the being of a God, or makes observations concerning human affairs; when all of a sudden I am surprised to find, that instead of the usual copulations of propositions, *is*, and *is not*, I meet with no proposition that is not connected with an *ought*, or an *ought not*. This change is imperceptible; but is however, of the last consequence. For as this *ought*, or *ought not*, expresses some new relation or affirmation, 'tis necessary that it should be observed and explained; and at the same time that a reason should be given; for what seems altogether inconceivable, how this new relation can be a deduction from others, which are entirely different from it. But as authors do not commonly use this precaution, I shall presume to recommend it to the readers; and am persuaded, that this small attention would subvert all the vulgar systems of morality, and let us see, that the distinction of vice and virtue is not founded merely on the relations of objects, nor is perceived by reason.

In some, "ought cannot be derived from is." That is, Hume concludes that the moral "ought" can never be logically derived from any set of descriptive "is" statements. Thus far, it would seem, then, that the logical positivists would view ethical statements as meaningless.

The Naturalistic Fallacy

Moore (1903) also claimed that a philosopher commits a formal logical fallacy when he or she attempts to prove a conclusion about ethics by appealing solely to empirical observable terms. Defining the concept "good," Moore argued, is as impossible as defining the concept "yellow"; yellow is just a simple concept. It is simple in that it cannot be further defined in terms of any other concept (for instance, blue). Yellow is just yellow, and this is as far as one can get when trying to define it. Just so with good. Good cannot be defined or analyzed, particularly with any other natural terms. Again, however, it would seem that the logical positivists' verifiability criterion is not satisfied and ethical statements, although, apparently syntactically correct, are, by the application of the verifiability criterion, found to be meaningless. And just so. The logical positivist, Ayer (1952) stated:

> For we have seen that, as ethical judgments are mere expressions of feeling, there can be no way of determining the validity of any ethical system, and, indeed, no sense in asking whether any such system is true. All that one may legitimately enquire in this connection is, what are the moral habits of a given person or group of people, and what causes them to have precisely those habits and feelings? (Ayer 1952, p. 112).

And further:

> Such aesthetic words as "beautiful" and "hideous" are employed, as ethical words are employed, not to make statements of fact, but simply to express certain feelings and evoke a certain response. It follows, as in ethics, that there is no sense in attributing objective validity to aesthetic judgments, and no possibility of arguing about questions of value in aesthetics, but only about questions of fact. A scientific treatment of aesthetics would show us what in general were the causes of aesthetic feeling, why various societies produced and admired the works of art they did, why taste varies as it does within a given society, and so forth (Ayer 1952, p. 113).

This has been called *the emotive theory of ethics* that ethical statements do not have normal cognitive meaning—there meaning is solely emotional. These are like other emotional utterances"—"Yuck" and "Wow."

Forms of Scientific Explanation: Hempel

The logical positivist Hempel (1970) engaged in a logical explication of the concept of *scientific explanation*. What does it mean to explain something? What does it mean to provide a scientific explanation? Hempel argued that to explain something was to subsume that phenomenon under scientific laws. Hempel thought

that there were two types of scientific laws and hence two types of scientific explanation.

1. *Deductive nomological explanation*. These explanations have the form of a deductive argument in which the statement-to-be-explained is the conclusion and the premises contain at least one universal scientific law (also called a nomological). All the premises also have to be true in order to be an explanation. Here is an example: "Why did this oxygen expand when heated?"

   DN Explanation
   (a) Oxygen is a form of gas.
   (b) *All gases expand when heated under constant pressure (the scientific law).*
   (c) Therefore, this oxygen expanded when heated.

   Note that this has the form of a deductive argument, its premises are all true, and the premises contain at least one scientific law: Boyle's law. Thus, for Hempel, this is a successful example of a scientific explanation.

2. *Inductive/statistical explanation*. The second type of explanation is called inductive statistical explanation because the law in the premises is not a universal scientific law but rather a probabilistic law. Again, scientific explanation occurs, and individual events are subsumed under laws—but this time, the laws state probabilities instead of certainties. Also as in DN explanation, all the premises need to be true and the statement-to-be-explained is the conclusion which is deduced from the premises. Here is an example of an attempt to explain why John recovered from pneumonia after taking penicillin:

   Inductive Statistical Scientific Explanation
   (a) John had pneumonia.
   (b) There is a high probability that after taking penicillin, pneumonia will be cured.
   (c) *John took penicillin.*
   (d) Therefore (it was probable that), John was cured.

   This last form of scientific explanation is much more controversial. How probable do the premises have to make the conclusion—more probable than not? Reduce prior uncertainty?

Unity of Science

The logical positivists also thought that all science was one large interrelated edifice. They argued that some sciences were more basic than others—and these less basic sciences could be "reduced" to the more basic ones. The logical positivists thought, for example, that all the laws of biology ought to be reduced to the laws of chemistry and all the laws of chemistry ought to be further reduced to the laws

of physics. Psychology for them should be able to be reduced to biology, which can in turn be reduced to chemistry… etc. However, when they attempted such theoretical reductions, they usually failed; they could not reduce, say, Boyle's law to physics. However, it did raise interesting questions: what are the relationships between laws of two different sciences, are they just *sui generis*, or is one more basic than another?

The Demise of Logical Positivism

Because the logical positivists could not come up with a verifiability criterion that was internally consistent, and because of what many regarded as the negative implications of their criterion such as rendering ethical claims as meaningless, the logical positivists eventually faded away. However, some of their legacy is worthwhile. Contemporary analytic philosophy still is focused on an analysis of language in that it typically engages in conceptual analysis, and there is a heavy reliance on symbolic logic. Philosophers and those influenced by philosophers have taken "the linguistic turn" and paid attention to language, meaning, and logic.

Special Topic I: Logical Positivism and Radical Behaviorism

Some quite reputable scholars have argued that B.F. Skinner was a logical positivist or at least that he was so influenced by logical positivism that when logical positivism was falsified, Skinnerian psychology was also falsified. The historian of behaviorism Smith (1986) has suggested that historians such as Koch (1964) have advanced three distinct theses about the affiliation between logical positivisms and radical behaviorism: (a) *the importation thesis*, which states that Skinner imported his philosophy and methodology from logical positivism; (b) *the subordination thesis*, which states that Skinner regarded his psychological views as subordinate to these prior philosophical views; and (c) *the thesis of linked fates*, in which the fate of Skinner's behaviorism was therefore linked to the fate of logical positivism.

Smith argued that these three are all false. Although for the complete case, I would recommend reading Smith's excellent book (1986), and I will give one piece of Smith's refuting evidence for each thesis. Regarding the importation thesis, a review of the historical record reveals that Skinner never spoke positively about the verifiability criterion, never cared to develop a demarcation between meaningful and meaningless statements, never carried out a logical analysis of constructs, and, in short, never extrapolated the central tenets of logical positivism into his psychology. Instead, he developed an indigenous, psychological analysis of epistemology and psychology, where knowledge was the result of conditioning

processes producing effective behavior. Skinner did talk about the operational definitions of psychological terms, but he cashed this out in terms quite different than those of the logical positivists; that is, he did not want to define psychological terms intersubjectively. Rather, he called for an analysis of the scientists' verbal behavior to discover environmental variables that govern its emission and effectiveness.

Regarding the subordination thesis, Skinner never viewed his work as subordinate to philosophical concerns. An anecdote is very revealing of his priorities here: When the young Skinner was told by the philosopher Alfred North Whitehead that a psychologist should closely follow developments in philosophy, Skinner replied, "it is quite the other way around—we need a psychological epistemology." And Skinner eventually produced a psychological epistemology. Thus, because the alleged links between logical positivism and Skinner's do not exist, they do not share linked fates.

Finally, the logical positivists took physics as the most important science and the one that should serve as the exemplar for others. They thought that all other scientists should mimic the way physicists were doing science and that all other sciences should be reduced to physics. Skinner, in contrast, thought that biology was the most important science for psychology. Thus, although Skinner was influenced by Mach's biological positivism, he was not influenced and his theory was not derived from logical positivism.

Special Topic II: Epistemic and Philosophical Problems of the APA's Ethical Code

The American Psychological Association (2002), like many professional organizations, has generated an Ethical Code, called "The Ethical Principles of Psychologists and Code of Conduct" (one can review it at http://www.apa.org/ethics/code/index.aspx). Psychologists must adhere to the letter of this code or at least in principle face penalties—including the loss of one's professional license to practice as states have adopted adherence to this code in their state laws. The APA's Ethical Code makes a series of claims such as

> **5.05 Testimonials** Psychologists do not solicit testimonials from current therapy clients/patients or other persons who because of their particular circumstances are vulnerable to undue influence.
>
> **6.07 Referrals and Fees** When psychologists pay, receive payment from, or divide fees with another professional, other than in an employer–employee relationship, the payment to each is based on the services provided (clinical, consultative, administrative, or other) and is not based on the referral itself.
>
> **10.06 Sexual Intimacies with Relatives or Significant Others of Current Therapy Clients/Patients** Psychologists do not engage in sexual intimacies with individuals they know to be close relatives, guardians, or significant others

of current clients/patients. Psychologists do not terminate therapy to circumvent this standard.

Your initial reaction might be that these specific claims seem reasonable, and in fact, you might agree with these. However, for the philosopher, initial plausibility is not sufficient; philosophers want to know answers to basic and important questions such as (1) What are the arguments for these ethical conclusions?; (2) How sound are these arguments?; and (3) Are the terms used in these claims clear?

Here are some more specific and, in my humble opinion, tough and problematic questions regarding the APA's Ethical Code:

1. *What does the APA mean by "ethical?"* Are the logical positivists right in that these kinds of statements are not empirically meaningful—that these are just psychologist's emotional utterances concerning certain things? If the logical positivists are wrong, what observations can an empirically inclined psychologist use to understand the meaning of these ethical claims?
2. *What is the case—the arguments—for each of these claims*? Interestingly, the APA simply does not offer **any** arguments for these claims. For example, there is no companion publication that lies out the case for each of these ethical claims. Instead, these claims are presented *ex cathedra*—as proclamations whose truth seems only to be warranted only by an appeal to authority—the authority of the APA (such as it is). The APA seems to be saying, "Do this or don't do this, BECAUSE WE SAID SO!" But psychologists have typically been unwilling to accept the truth of a claim simply based on an appeal to an authority. Why does APA force them into this position with these ethical pronouncements—pronouncements that carry serious punitive consequences for them? Why not publish the arguments for these ethical pronouncements so that all can evaluate the quality of these? This seems particularly important because the APA across versions of its Ethical Code has sometimes dramatically changed its ethical pronouncements (e.g., sometimes claiming that bartering is wrong—sometimes not; sometimes precluding all sexual contact—sometimes not).
3. *What is mean by these terms, for example, "undue influence?"* Are all the terms used throughout the code sufficiently clear or do they hide prejudgments that are none to clear—such as "undue"?
4. *How are deterministic assumptions that often underlie science consistent with ethical assumptions in human free will and choice*? Kant stated that "ought implies can"—that to claim that someone morally *ought* to do something implies that they have a choice and at least is *able* to do this. For example, the ethical claim "You morally ought to learn four foreign languages in one day" is regarded as false simply because this cannot be accomplished. But science often assumes determinism (see for example Skinner 2002). Determinism assumes that there is no "choice"—including moral choices—but rather causes operate and necessitate certain events. Scientific laws also assume this—copper must conduct electricity—it has no choice in the matter. If humans have choice, how can we conduct a scientific study of human behavior and discover scientific laws?

5. *What is the normative ethical account that underlies the ethical reasoning of the APA's ethical pronouncements*? Is the APA relying upon a *utilitarian* moral theory in which the positive and negative consequences of acts are being calculated, and thus, what becomes ethical is the behavior with the best set of positive outcomes and fewest negative outcomes? Are they utilizing a *deontic* ethical theory in which the duties of a psychologist are being explicated, conflicts between duties are resolved, and specific acts are either proscribed or necessitated? Or, are they utilizing a *virtue* ethical theory such as Aristotle's? Unfortunately, the APA is mute on this critical question.
6. *How does the APA's ethical account relate to psychologists' own empirical and theoretical work*? Gilligan (1982) in her famous *In a Different Voice* has suggested that men and women reason in quite different moral ways? Yet the APA's Ethical Code shows no recognition of the work of psychologists on this important issue. Is this a problem? Her mentor Kohlberg (1971) suggested that individuals develop morally and transition from stage to stage. Level II stages represent "conventional morality" in which the individual obeys the standard moral norms in a particular context—in this example, the APA's Ethical Code. But Kohlberg suggested that there were higher "post-conventional" moral stages in which one criticized conventional morality, transcending it and conforms to higher principles of morality relating to universal rights and democratic principles that often require civil disobedience to conventional morality. Thus, do individuals who have developed more morally transcend the APA Ethical Code and behave inconsistent with it—and would not then this, if the psychologist Kohlberg, is correct, actually be a good thing? How is the APA to address this indigenous work? Right now, it seems simply ignore these views.
7. *Is the Ethical Code a problematic attempt to avoid external policing—which actually might do a better job on actually enforcing reasonable standards for the behavior of psychologists*? For example, psychologists often fail to administer evidence-based interventions; they administer assessment devices with problematic psychometrics such as the TAT? (Lilienfeld et al. 2000). Yet in the current system, they usually "get away" with this quite problematic behavior? And their clients suffer. Ought one to be cynical and wonder is this just the function of the APA's Ethical Code: to give the *appearance* of a genuine concern about ethics—while all the while providing a smoke screen to allow the guild to actually get away with a lot of problematic behavior?

These are just a few of the kind of deep and provocative questions a philosopher can ask about the Ethical Code. Philosophers starting with Socrates have sometimes been thought of as *gadflies*—folks that upset the *status quo*—by raising problems that other folks simply do not notice or prefer not to notice. But the philosopher wants her intellectual house in order and wants not to be hypocritical—for example, to claim rationality but then to have serious gaps in this by, for example, irrationally and dogmatically adhering to an Ethical Code that is presented to them purely by authoritarian appeals by their professional organization and state boards.

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