

Chapter 2

Knowledge

'Et ipsa scientia potestas est'

(Knowledge is power)

Bacon.

'Litterarum radices amaras, fructus dulces'

(The root of knowledge is bitter, but its fruit is sweet)

Cicero.

2.1 Introduction

Science aims to give us knowledge, scientific knowledge. According to the classical conception, the axiomatic ideal of science, scientific knowledge must be absolutely certain, the result of demonstration from general principles. But, alas, certainty has often proven to be an illusion; even Newton's mechanics, one of the most admired scientific theories and for a very long time believed to be certain, has proven not completely true. Should we still say that it is a piece of scientific knowledge? The answer depends, of course, on what conditions we should associate with the concept of knowledge. What is knowledge?

2.2 Knowing That, Knowing How and Acquaintance

The everyday use of the word 'know' denotes a variety of things. The first category consists of truths and we specify that kind of knowledge as 'knowing that', alternatively 'propositional knowledge'. Such knowledge is such that its content can be expressed by complete sentences. We have propositional knowledge if we *know that* something is the case. The content of this knowledge—that which we know—can be expressed in those complete sentences that follow 'that' in 'I know that . . .'. It can be obtained by listening to a lecture or reading a book, nothing more is needed.

The second category consists of skills, such as riding a bike, playing a musical instrument, speaking a foreign language, etc., which we indicate by the term ‘knowing how’. Such knowledge cannot be communicated only through language. This is sometimes called tacit or practical knowledge. For example, learning how to ride a bike requires both demonstration and practice. Much of our professional knowledge includes these two elements. Indeed, one would hope that, e.g., dentistry is ripe with both sorts of knowledge. Yet, it is often easy enough to draw a somewhat clear line between propositional and non-propositional knowledge, even within the same field of study. For example, most medical educations make a clear distinction between clinical and non-clinical courses, thus more or less reflecting the distinction between knowing that and knowing how.

The third category consists of knowledge of objects. In German, French, Swedish, Italian (and presumably other languages) the distinction between knowledge of objects and knowledge of truths is made clear by using different verbs. In German one distinguishes between ‘wissen’ and ‘kennen’, in French between ‘savoir’ and ‘connaître’, in Swedish between ‘veta’ and ‘känna’ where the former words are used when we talk about knowledge of truths and the latter when we are concerned with knowledge of objects.

In common English there is no established corresponding distinction, which is a drawback for doing epistemology. I suggest using the word ‘acquaintance’ as term for knowledge of objects.¹

The philosophical discussion about the nature of knowledge has almost exclusively been about knowledge of truths. The reason for this is that a correct analysis of this concept of is a highly controversial topic, whereas skills and knowledge of objects has not evoked much controversy. Indeed, when someone claims that he *knows that something is the case* (propositional knowledge), one is often want to doubt the reasons for this claim and have difficulties knowing whether it is in fact true or false. But if someone says that he *knows how something should be done* (a skill), or that he knows a certain person one often finds that the truth of such a claim is easy to verify. Thus, as we continue our discussion we shall concentrate on propositional knowledge, which we shall henceforth simply refer to as knowledge.

¹ Russell once introduced the distinction between knowledge by description and knowledge by acquaintance, which is not the same as that give here. According to Russell, the only things one had knowledge by acquaintance of were sense data. Talking about sense data was in my view a mistake; we have no knowledge about such things, since they don’t exist. But ordinary physical objects, including persons exist, and these we may be acquainted with.

2.3 The Definition of Propositional Knowledge

The most common view among philosophers—derived from Plato—is that propositional knowledge is *justified true belief*. That is to say, if P stands for a particular proposition, and if X stands for a person who holds this proposition, then X *knows that P* if and only if:

- P is true,
- X can justify P,
- X believes P.

Each one of these criteria is a necessary condition for knowledge, and these three criteria are sufficient when taken together. Why is it that so many have stuck with this definition? An immediate answer to this question is that Plato’s definition captures pretty well the everyday use of the word ‘knowledge’: the concept of someone knowing a proposition. Consider the following three dialogues.

First Dialogue

Charlie I know that New York is the capital of the U.S.A., I’m sure of it.
 Lisa You’re wrong, Washington D.C. is the capital of the U.S.A. It doesn’t matter that you’re sure of it, because that only means that you *strongly believe* in your claim, and that’s not the same as *knowing*. In order to *know* something, that something has to be *true*.

Second Dialogue

Charlie I know that it’s going to rain tomorrow.
 Lisa How do you know that?
 Charlie I just know it!
 Lisa If you can’t explain *how* you know that it’s going to rain, then you don’t know it. Even if it is true that it will rain tomorrow, you don’t know that unless you can explain how you came to your conclusion, or belief.

Third Dialogue

Charlie I know that the speed of light is constant and independent of the speed of the light source, but I don’t believe it.
 Lisa Why don’t you believe it?
 Charlie Because common sense tells me that the speed of a light ray should be the sum of both the speed of the light source and the speed of the light ray when it is emitted.
 Lisa Then why do you say that you know that the speed of light is constant?
 Charlie Because I know that Einstein claimed that it is the case, and all physicists believe him.

Lisa But if you don't believe it yourself, then you can't claim that you *know* that the speed of light is constant. All you can claim to know is that *Einstein and other physicists claim that the speed of light is constant*, which is completely different.

These dialogues are perhaps a bit artificial, yet they seem to reflect how we typically view the proper use of the phrase 'I know that. . .'. If they are accepted as accurate reflections of every day speech, then they show that each of the criteria above are necessary conditions for knowledge. Some philosophers have constructed situations that purport to show that together the above criteria are not sufficient for knowledge; this is the famous Gettier's problem, which I'll discuss in Sect. 2.4. But first we shall discuss some implications of these criteria.

2.3.1 *P Is True*

If one knows that something is the case, one may make a claim expressing this fact and that claim is then true. Another way of stating the same thing is to say that when one knows that something is the case, one is simply describing a part of the world as it actually is; since, to say that a proposition P is true is equivalent to asserting P.

This relationship between knowledge and truth is essential for our actions, when we plan what to do; for if knowledge was independent of truth, what one knows would be of no use in guiding one's actions. This is a fatal consequence for all situations in which one needs to *use* knowledge for some purpose. An example that illustrates this point is the difference between the actions of the American Federal Reserve in 1929 and 1987. During the stock market crash of 1929, the Federal Reserve kept interest rates high (to defend the gold standard) and let a large number of banks go bankrupt. This resulted in people losing faith in their banks. This loss of faith prompted people to remove their savings; thereby, making it impossible for the banks to lend out money or make investments. Ultimately, all this culminated in the great depression and a 60 % decrease in the GDP of the USA over 3 years. Not until 1941 was the GDP back to the same level as 1929. This was certainly not intended and it is clear that Federal Reserve did not know enough about the mechanisms of the economy.

In 1987, with much better insight as to the workings of the economic system, people realized that the role of the Federal Reserve was to ensure that the banking system functioned properly, and to make sure that people believed that their money was secure. The Federal Reserve took actions to ensure this security, and achieved the desired results. For even though the stock market had a sharp decline for 1 week in 1987, no depression resulted and the crisis was over within a year.

But was the knowledge about the economic mechanisms good enough? There are discussions about the decision to let the Lehman Brothers bank go bankrupt in 2008, since it started a long period of low growth. Some say that the decision

makers had not properly learnt the lesson from the great depression. I have no considered opinion about these matters; it only further highlights the point that true justified beliefs, i.e. knowledge, is crucial for proper action.

Sometimes people equate ‘true’ with ‘true for me’. This is a mistake. Truth should be understood in an absolute and objective sense: a proposition is true, or false, *simpliciter*. The truth of a proposition is completely independent of the beliefs and cultural context of the person who utters it. Indeed, one must clearly distinguish between ‘P is true’ and ‘X believes that P is true’, for it is obvious that X can believe P, i.e., that P is true, when in fact P is false, and vice versa. This implies that a person can believe that he knows some proposition, even though the proposition is false. Indeed, it often happens that long after one has claimed that a proposition is true, one realizes that it is false; at which point one should admit the mistake and withdraw the claim to know.

When talking about older theories some people are inclined to say that such theories was true, but now they are false. I have, for example heard many students saying that Ptolemy’s geocentric theory about the world, put forward in his *Almagest*, was true in his times, but now it is false since it contradicts the heliocentric theory which is true. Ptolemy’s theory is based on observations of the motion of the sun, the moon, the planets and the stars. They all appear, from the view-point of an observer at earth, to move around the Earth in circular motions.² With Ptolemy’s theory, one could make fairly accurate predictions of the positions and motions of all celestial bodies visible with the naked eye, so Ptolemy’s theory was supported by observations and had predictive power. Indeed, prior to the invention of optical instruments, it was not possible to make any observation that would contradict his theory. Almost anyone alive at a time prior to the invention of the telescope (early 1600s), would easily be convinced that one could obtain knowledge of the universe by studying Ptolemy’s book. However, we now know that Ptolemy’s theory is false, and that all those who claimed to have knowledge of the universe through the study of Ptolemy’s work were mistaken.

We may say about ancient astronomers that they had good evidence for their theory and they believed it, but we should not say that they knew how the world system moved. For if I would say that they knew, I would accept that their belief is true, which I do not.

Some are inclined to say that Ptolemy had knowledge of the planetary system, but that we *now* have different (or better) knowledge. This statement implies that one accepts that Ptolemy had *false* knowledge. But false knowledge is not knowledge, just as counterfeit money is no real money (Fig. 2.1).

A common argument against an objective, absolute understanding of truth builds on the fact that humans have developed many different cultures and conceptual frameworks. Some claim that there is no such thing as absolute truth; that all truths are relative to one’s culture, paradigm, theory or research domain. The argument is

²This is a simplified picture; Ptolemy was forced to add so called epicycles, circles on the circles, in order to get empirically adequate description of some of the planet’s motion.

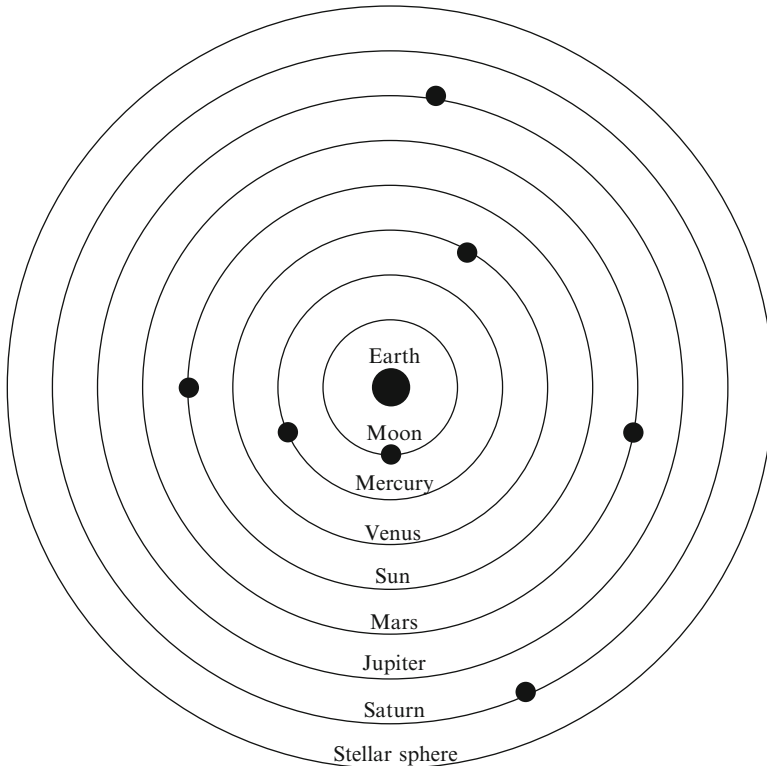


Fig. 2.1 The basic structure of Ptolemy's geocentric worldview (No epicycles are included in this figure, see Fig. 3.2)

that we cannot say anything about the way the world is without the use of language and our languages are human creations. From this premise one arrives at the conclusion that truth is language dependent. Another way of stating the argument is that humans live in different conceptual frameworks; and so there is no such thing as truth in and of itself, but only truth in some conceptual framework.

There are plenty of arguments against this line of reasoning, of which the first was already laid forth in Plato's *Theaetetus*. This dialogue contains a discussion of Protagoras' claim that *things are as they appear to be*. This claim is a version of the relativistic thesis that there are no objective truths. Theaetetus, a young man who finds himself in conversation with Socrates, puts forth Protagoras' claim as a possible definition of knowledge. Socrates then asks Theaetetus whether everyone is in agreement with Protagoras regarding this matter, and Theaetetus answers that most people are not. Socrates then responds that Protagoras must admit that his claim is incorrect, for it says that things are as they appear and since to Protagoras' opponents the view appears false, it is false. This leads one to realize that the thesis that *all* truths are relative is self-contradictory. We cannot consistently say that *all* truths are relative.

Another interesting argument against relativism, given by Donald Davidson,³ is based on observations of human language-users. It is presented here in abbreviated form:

1. To claim that other humans live in other conceptual frameworks (and that truth is relative to some conceptual framework) than our own implies that we claim that they think and speak.
2. To correctly claim that people think and speak requires that we know they are actually saying something, and not just producing sounds.
3. In order to know that people are saying something, we have to at least know something of what they mean.
4. In order to know what people mean, we must be able to translate some of their utterances into our language.
5. In order to translate their utterances into our language, we must ascribe to them a set of beliefs, desires, attitudes, and a way of connecting these mental elements with each other.
6. In order to ascribe to people such mental elements, we must first assume that they share with us some background beliefs, desires and principles of thought.
7. But to have in common such a reference frame (beliefs, desires, and a capacity for knowledge) is to be situated in the same conceptual framework.

A key step in this argument is premise 5. The basic idea is that interpretation of what other people are saying requires that the interpreter ascribe to those people a large number of true beliefs about reality. (This is an instance of the *principle of charity*, a core element in Davidson's theory of interpretation.) In addition, the interpreter must also assume that the people, whose utterances are to be interpreted, are rational: otherwise one cannot make any sense of the content of those utterances. If this premise is accepted, then it seems that the conclusion is sure to follow.

The conclusion of this argument is that in order to claim that other people 'live' in different conceptual worlds, or frameworks, we must be in agreement, with respect to these people, about a considerable number of propositions, regardless of one's conceptual framework. Thus both Davidson's and Plato's arguments show that *all-embracing* relativism is not feasible.

There are thus strong arguments for the claim that the truth of a proposition depends upon how the world is actually constituted and not on how we perceive it. Aristotle formulates this idea as a definition of truth in his *Metaphysics*, (book 4, part 7):

To say of what is, that it is not, and to say of what is not, that it is, is false, while to say of what is, that it is, and to say of what is not, that it is not, is true.

This passage is often interpreted as an expression of a *correspondence idea*: if a sentence is true, then there is a correspondence between the sentence and what the

³ Donald Davidson (1917–2003), American philosopher of language and psychology. The argument is to be found in his paper 'On the Very Idea of a Conceptual Scheme', printed in his (1984).

sentence is about. It is quite difficult—some would say impossible—to describe more precisely the nature of this correspondence, and such an inquiry is beyond the scope of this book. Instead I shall move on to a discussion of the various consequences of this idea.

One such consequence of the correspondence theory of truth is that a proposition can be false even though we may have very good reasons for believing that it is true (and vice versa). This consequence opens the door for the sceptics, who want to argue that we can never be certain that we know anything. If the sceptics are correct, then the search for truth becomes pointless, since one can never be certain that it is ever attained. This seems to be a very strange conclusion. Indeed, consider humanity's canon of reasonable beliefs; there are good reasons for believing that a great deal of these are knowledge by virtue of being true. Yet, there are also good reasons for believing that some part of this canon is false. In other words, some (hopefully small) part of what we call knowledge is not knowledge. Of course, we do not know which parts of what we call knowledge are false: were we aware of such falsities, we would certainly separate it out and label it accordingly. (This very activity is often a result of research; one discovers that something previously accepted as knowledge is false). However, it would hardly be rational to throw away everything we take to be knowledge on account of a few bad eggs hidden among the good. The rational stance is surely an attitude of provisional belief: every proposition we call knowledge is probably true, but there is a risk of it actually being false, and so we should be mentally prepared to change our beliefs if new evidence presents itself.

A sceptic would ask: how do you know that most of what you call knowledge is true? Maybe it is all false! My answer to this question is simply that, in practical situations, even the sceptic takes an enormous amount of his beliefs as unproblematically true. I shall show this by giving a few examples.

Suppose the sceptic has a TV, and suppose that he pays for cable programming. The sceptic, in such a practical situation, believes, as a matter of fact, that he will continue to receive TV programming several days into the future. Similarly, when the sceptic purchases a carton of milk from a supermarket he believes that there is milk in the carton, and he would be quite surprised to find that it contained anything else. The sceptic drives to work with the belief that the building in which he works still exists, and that he was not fired overnight. Upon reflection of these examples it seems that in order to doubt something, one must take a great many things for granted. One can only doubt a proposition with respect to some background knowledge that one takes for granted, which implies that total scepticism is an incoherent view.

A more modest sceptic would perhaps say that he does not doubt that some proposition is true, but that he merely refrains from believing any propositions. However, in practical situations, as we have seen, even the modest sceptic would act as if he does believe some propositions to be true. Thus even the most compromising of sceptics behaves as if he believes, in all practicality, a great number of propositions. Since there are very good reasons to hold that both habitual and deliberate actions are based on beliefs, independently of their expression, there

are very good reasons to believe that the sceptic believes a great many propositions, despite his assurances to the contrary.

In summary, we attribute to ourselves a great deal of knowledge; albeit, some of which, unbeknownst to us, is not actually knowledge by virtue of being false. This is the basis of the *provisional nature of knowledge*: since we do not know which of those propositions we call knowledge is false, we must be prepared to rethink everything, even though we have good reasons to believe that most of what we take ourselves to know is true.

2.3.2 *Good Reasons for P*

What constitutes good reasons for a proposition P depends on the kind of proposition P is. We can broadly distinguish three different types of propositions that are justified in completely different ways: (i) *mathematical*, (ii) *observational*, and (iii) *theoretical*. The line between observational and theoretical propositions is a controversial issue that shall be left for later (The dependence of observational propositions on theory will be discussed in Sect. 4.4).

- (i) To give good reasons for believing a *mathematical proposition* is to give a proof. If a mathematical proposition has not been proven, then there is not sufficient reason to believe it is true.
- (ii) It is less clear what constitutes good reason to believe observational propositions. In everyday situations, the fact that the person who is making the claim saw the relevant event take place is often considered a good reason for us believing him. However, anyone can make a mistake when it comes to one's observations, and we often delude ourselves. Richard Wiseman discusses these things in his *Paranormality*.

In a court of law a single direct witness of a person committing a crime will often not suffice to prove a case. An interesting example is the Court of Appeal's treatment of Lisbet Palme's designation of Christer Pettersson as her husband's killer. The prime minister of Sweden, Olof Palme, had been shot by a gunman at the centre of Stockholm 1986, and Christer Pettersson was tried for the murder and convicted in the first instance. But the circumstances of her identification of this person were such that there was reasonable doubt; and therefore Pettersson was acquitted by the court of appeal on account of lack of evidence.

However, if several unconnected people had observed the shooting, and all these people were of sound mind and in circumstances favourable for reliable observation of this kind of incident, then their collective testimony would have been enough to count as good reason for believing Pettersson guilty of the crime.

Whereas a single person's testimony often fails to suffice in a court of law, often the testimony of a single scientist is taken to suffice as good reason to

believe some result in the sciences. For example, one scientist's observation of a measurement on an instrument is sometimes considered a good reason for believing that the observational proposition is true. But, of course, we cannot completely dismiss the possibility of fraud or mistake.

- (iii) What constitutes a good reason for believing a theoretical proposition is far more difficult to say. Indeed, one could say without too much fear of contradiction by one's peers that the most discussed question in the philosophy of science regards precisely this issue: under which conditions is a scientific theory sufficiently strong for commanding general confidence? This question will be the central topic of the next chapter.

This criterion for knowledge—good reasons for believing a proposition is true—perhaps the least controversial as a general condition. If a person believes some proposition P, which happens to be true, but cannot give good reasons for his confidence in the truth of P, then we would hardly say that this person knows P. Instead we would perhaps call it 'hearsay', or that 'he is just repeating what he heard'.

2.3.3 *What Does It Mean to Believe That P?*

To believe that a proposition is true is the mental aspect of the concept of knowledge. Notice that belief is not essentially religious. All people believe a large number of different things about the weather, the future and themselves. Belief is a mental state, similar to hope, doubt, etc.: i.e., it is a *propositional attitude*. (See Chap. 12).

It would be completely unnatural to say of a person that he knows that P, yet does not believe that P. In particular, if we accept the rest of Plato's definition of knowledge, this would amount to our claiming that he has good reason to believe P, yet he does not believe P. How could this be rational? (The philosopher G. E. Moore once remarked that it is paradoxical to say: It's raining, but I don't believe it.)

Note also that this criterion implies that if we want to say that an animal, or machine, has (propositional) knowledge, we must ascribe to that animal, or machine, beliefs concerning, for example, its immediate surroundings. There are various views on this subject: some think that there are no principal differences between humans and animals in that at least *some* animals are capable of belief, whereas others think that *only* humans are capable of belief. Additionally, even if one ascribes beliefs to animals, it does not follow that animals can have propositional knowledge, i.e., knowledge that is transmitted through language. The most reasonable view is, it seems, that animals only have non-propositional knowledge (skills). Even if we can 'speak' to dogs and various other animals, it is doubtful that what we teach them by 'speaking' to them is the kind of knowledge that we humans acquire when we read a book or listen to a lecture.

Can computers have knowledge? Can they have beliefs? In today's world it does not seem reasonable to say that computers could have these capabilities. What would we say about a futuristic computer that is capable of anthropomorphic behaviour? Would we still say that there is a principal difference between humans and computers? This is a controversial question within AI (Artificial Intelligence) research as well as within the philosophy of mind, and there is little consensus among the various researchers and philosophers. The only thing that can be said, in general, is that if we want to retain Plato's definition of knowledge whilst allowing for future machines having knowledge, then we would also have to allow for future machines having 'beliefs'. On the other hand, if we think that computers are in principle incapable of having beliefs, and if we want to retain Plato's definition of knowledge, then we must hold that computers are likewise incapable of knowledge, irrespective of their performance.

For many it is obvious that computers cannot believe, have knowledge or think; and that these abilities are uniquely human. However, we should note that whenever we say that a person believes something, knows something, or is intelligent, that we do so on the basis of her apparent behaviour. We cannot, after all, observe a person's mental processes. If we were to use the same criteria (in terms of observed behaviour) when considering whether a computer can have knowledge as we do when considering whether a human can have knowledge, then it seems that computers could have knowledge, at least in principle. The English logician Alan Turing (1912–1954) formulated this idea as the Turing test, which is a criterion for intelligent, human behaviour. The Turing test is carried out in the following way: suppose you type questions on a keyboard that is in some unknown way (for you) connected to other devices. The printer then prints out the answers to your questions. You are allowed to ask whatever you want and as many questions as you please. If you are unable to tell whether it is a human or a machine that is answering the questions, and it is a machine that is answering, then that machine is exhibiting human mental capacities. That is to say, the machine in question has knowledge and it can think.

This test falls short of any generally accepted criteria for thought. But those who reject it are faced with two options: either they must construct some other criteria for thought, or else maintain that rational thought is a uniquely human capacity. If one takes the latter view, then, of course, every such test to see if a machine can think is completely misguided.

In summary, we have discussed one of the most widely accepted definitions of knowledge. Application of this definition has brought with it various consequences as regards our parlance. The point of this discussion is partly to promote a well thought out and consistent use of the concept of (propositional) knowledge, and partly to clarify the relationship between knowledge, truth, justification and belief.

2.4 Can One Know Without Knowing that One Knows?

A common argument against the requirement that knowledge must be true is the following: since you admit that in many situations you cannot be sure that a proposition P is true, even if P is true, then you do not know that you know P; and thus you do not know P. This is a logical mistake. The argument has the following form:

1. If X knows that P, then X knows that X knows that P.
2. It is not the case that X knows that X knows that P.

Therefore,

It is not the case that X knows that P.

The mistake is in the second premise. The content of the claim that one knows that one knows that P is that

- One believes that one knows that P,
- One has good reasons for saying that one knows that P and
- It is true that one knows that P.

The first criterion is plausibly met; if a certain person, X, knows P, then P is a justified, true belief of X. It follows that if one attributes to X minimal capacities of self-reflection, then it is reasonable to suppose that X believes she know P. Similarly, one can say that she has good reasons for saying that she knows P. But is it true that X knows P? Yes, if P is true, X believes P and is justified in believing P, then X knows P. But this is the same as saying that it is true that X knows P. Thus one can say that one knows that one knows P, even though one has no sure method to *determine* whether P is true. It is, *in fact*, enough that P is true.

In addition, it is a controversial question whether premise 1 is a valid principle; many claim that it is a logical truth, (an axiom in epistemic logic) while others doubt this claim. The critics do not want to doubt that in individual cases it can be correct to say that if one knows P, then one knows that one knows P, but they do doubt that the principle holds for all cases. The dispute is about how to formalize the logical principles of the concept of knowing. Those who doubt that premise 1 is a valid principle have another argument against the claim that one does not know a proposition when one lacks a guarantee of the propositions truth.

2.5 Reliabilism

The conception of knowledge as justified true belief has been questioned the recent decades. The seminal paper in this development was a short paper by Edmund Gettier, 'Is knowledge justified true belief?' (1963). He constructed a couple of examples where the three conditions for knowledge are clearly fulfilled, but yet we still would be unwilling to say that the proposition under discussion was known by

the speaker. This suggests that the three conditions are not sufficient and that some amendment is needed. But, alas, all efforts to add something have failed due to the additional clause excluding whole categories of propositions that we would recognize as clear examples of knowledge.

It has become increasingly clear that the problem is not truth, not belief, but justification: more precisely, justification of empirical propositions. This has inspired an increasing number of epistemologists to replace justification with a more descriptive condition, viz., that the beliefs called ‘knowledge’ have been arrived at using a reliable procedure; thus the label ‘reliabilism’. The general idea is that whether a person can be said to know a proposition P or not, does not depend on him being able to produce good reasons, but whether he *in fact* used a method for arriving at his belief that has proven reliable. Which methods should qualify as reliable is currently under debate, but the tendency is clear: a lot of people are adopting some variant of reliabilism.

This trend is but one aspect of the naturalistic tendency in current epistemology, viz., a rejection of the notion that epistemology can be an independent basis for the other sciences. Naturalists view epistemology as an integral part of science, no more basic than cognitive psychology for example. The interested reader may consult *Stanford Encyclopaedia of Philosophy/knowledge – analysis* (<http://plato.stanford.edu>).

Some authors e.g. Luciano Floridi (2011) claim that the Gettier problem cannot, as a matter of principle, be solved. Floridi’s conclusion is to focus attention on the concept of information instead; this is more basic than the concept of knowledge.

2.6 Data, Information, Knowledge

It seems that scientific knowledge in many areas, e.g., in palaeontology, genetics and medicine, is increasing with an ever-increasing pace. New technologies in e.g. DNA sequencing and new possibilities to store, retrieve and analyse enormous amounts of data has made it possible to gain knowledge in areas previously believed to be inaccessible.

Using modern technology it is possible to collect data, transform data sets to information and then arrive at more knowledge. Such processes have always been important in science, but with the rapid development of computers and computer technology it has come to centre stage in some sciences. Therefore the relations between the three concepts, *data*, *information* and *knowledge*, deserve some scrutiny.

Some philosophers, the first being Kant (as far as I know) observed that the concept of information is somehow more basic than that of knowledge. In modern times Gareth Evans made the same observation, according to Michael Dummett:

Evans had the idea that there is a much cruder and more fundamental concept than that of knowledge on which philosophers have concentrated so much, namely the concept of information. Information is conveyed by perception, and retained by memory, though

also transmitted by means of language. One needs to concentrate on that concept before one approaches that of knowledge, in the proper sense. Information is acquired, for example, without one's necessarily having a grasp of the proposition which embodies it; the flow of information operates at a much more basic level than the acquisition and transformation of knowledge. I think that the conception deserves to be explored. It's not one that ever occurred to me before I read Evans, but it is probably fruitful. That also distinguishes this work very sharply from traditional epistemology. (Dummett 1993, p. 186)

But what more precisely is the relation between information and knowledge?

The first thing to notice is that the word 'information' is used in, at least, three distinct senses. The first sense is *semantic information*. We use the 'information' in this sense in the following examples:

- 'The study counsellor informed the student about the job prospects for lawyers.'
- 'The allied forces during WWII collected information about German plans by decoding their encrypted messages.'
- 'By studying the map carefully we got information about the best way to drive.'

In these examples the information talked about can be expressed as complete meaningful sentences, which is why it is called semantic information.

It has been some debate concerning the veracity of semantic information; must it be true or not? It is now a general consensus that false information is no real information. False information can be compared with counterfeit, i.e. fake money. Fake money is no real money and similarly false information is no information. The reason is that in neither case can it (false information or counterfeit) be used for what it is supposed to be used for. Money is used for buying things, and false money cannot be used for buying anything, it is worthless. (If you succeed in getting an item by using counterfeit, you did not really pay; you deluded the seller, and hence you did not buy the item.) Information is used for making plans and decisions in order to achieve our goals. But false information is useless for this, or worse.

In both cases we may be unaware of the real state of affairs. We may mistakenly believe that some piece of information is true and make decisions based on this. The risk of failure in such a case is much higher than if we had true information. Similarly, we may be unaware that a note in our possession is counterfeit and we try to use it for a purchase. Clearly, the risk of failure in our endeavour is higher than if it was real money; we are even in danger of being accused of being aware about the counterfeit and prosecuted.

It may be observed that semantic information need not be linguistic items. A map contains geographic information using a lot of symbols, lines, dots, curves, etc. By interpreting these symbols we can formulate sentences that express information contained in the map.

The second sense of information is usually called 'Shannon Information' after the seminal work of Shannon and Weaver, *The Mathematical Theory of Information* (1949). In this book they conceived information as a quantity. They studied the question how much information that can be transmitted from a sender through a cable to a receiver without distortion. In their resulting communication theory they defined information in terms of probability. The basic idea is that the amount of

information in a message is higher the less probable the sequence of signs is. Information in this sense may be called negentropy, i.e. the opposite to entropy.

Shannon information is the intended sense in the following sentences:

- ‘My memory stick can store 16 GB information’,
- ‘The flow of information operates at a much more basic level than the acquisition and transformation of knowledge.’ (Dummett quote above)

The third sense of ‘information’ is somewhat similar to semantic information, but where information is said to be contained or stored in a system without any higher cognitive capacities. Consider these examples:

- Our DNA contains information about hereditary traits.
- Migrating birds spending the winter in Africa obtain information about the time for flying to northern countries from the length of the day.
- My computer got information that a new version of the virus protection programme was available.

In such cases there is no mind involved. We might say that in these cases it is systems with feedback mechanisms that under certain inputs perform a certain output, and we call the input ‘information’ because it can be described in functional terms. We would not say that these systems obtain knowledge about the conditions; but we find it natural to say that they obtain information and perform certain operations as a result of the information.

But why call the input ‘information’? The reason seems to be that we can describe the input as being *about* something, often the state of the environment. It has content. Or rather, when *we humans* describe the input and the workings of the system we find it natural to talk as if the information-containing system consciously sent messages to us humans; we say that the systems obtain information, transmit information or store information about something, as if it were like a human mind. The core feature of this use of the word ‘information’ is thus its *aboutness*, its intentionality. This notion will be further discussed in Chap. 5.

Finally *data*. It is common in computer science to say that information is data with meaning. This is ok as far as it goes, but what is ‘meaning’? And how do data acquire meaning? It seems that minimally it means that meaningful data becomes information when we have been able to formulate declarative sentences expressing the information that is obtained from a data set.

Almost anything can be data. In order to obtain data from e.g. a story, from light from distant stars, or from the result of an experiment, we need to divide the stream of sounds, lights, or states of detectors into distinct items. When using written text as data source one must divide the string of linguistic signs into distinct items, such as words or longer or shorter expressions. Radiation from universe may be divided according to position (using a coordinate system for identifying position in the sky) and frequency distribution for example. Detector states, clearly distinct from each other, must be defined before any meaningful measurement can be done. In short, in order to obtain a data set, we need to define a principle for dividing up something into distinct pieces. Hence from a conceptual point of view, discerning data and

collecting a data set presupposes that we have a prior principle of making distinctions within a phenomenon. And making distinctions is always driven by presuppositions about what might be relevant and not for the research question. Sometimes we have lot of background knowledge from start, for example when studying the cosmic background radiation it seems obvious to sort data according to intensity and frequency in different directions. But in other cases it is far from obvious: listening or reading a story in order to collect empirical data there is no obvious way of transforming this story to a data set. Should we count frequencies of certain expressions? Should we look for grammatical forms? Should we study the order of types of expressions? It depends on purpose, of course.

The first sense of ‘information’ is that which is most close to what we mean by ‘knowledge’. Knowledge and semantic information can be expressed as true statements being about something. One could say that semantic information is the proper concept when we talk about the content of knowledge states of humans, but disregard that these knowledge states are mind states or whether the subject can produce good reasons for the content of his belief. One could say that semantic information is that which is expressed by the sentence *p* when we say of a person that she knows that *p*. In short, a piece of knowledge is a piece of information for which the knower can provide good reasons.

2.7 The Philosopher’s Versus the Sociologist’s Concept of Knowledge

The discussion has hitherto been about what one *ought* to call knowledge. Claiming that the *correct* meaning of the expression ‘X knows that P’ is that P is a true, justified belief of X is stating a norm. However, one can take a totally different perspective by applying a more sociologically oriented approach. Accordingly, knowledge is seen as merely that which humans within a particular society *call* knowledge. This means that one places ‘true’ and ‘considered true’ on the same footing. If one were to change the societal perspective, then what was knowledge may no longer be considered knowledge. There are two immediate interpretations of this sociological perspective. The first is that it is merely another version of relativism, in the sense that what a culture holds to be knowledge *is* knowledge, and there is no way of distinguishing between *real* knowledge and what is *taken* to be knowledge. The second interpretation is that sociologists are operating with another concept of knowledge, ‘what a certain culture considers to be knowledge’, and that they do not take a stance as to whether it is actually knowledge or not, or even whether it is possible to make a distinction between knowledge and what is taken to be knowledge. It may seem a legitimate viewpoint for a sociologist to be agnostic when it comes to this question, since sociology is not philosophy. However, if this agnosticism is universalized, then it becomes applicable to those propositions the sociologists themselves produce, and we are led to ask whether the sociologist’s

claims are supposed to be true regardless of culture, or are they merely opinions within his research group, discipline, university or society? Suppose that the sociologist answers that the latter alternative is the case, which he ought to do, since the first alternative leads to inconsistency in the sociologist's view. Then we ask ourselves, what is the point of his research? Does he want to solicit his own cultural domain? It is obvious that total relativism eventually leads to a complete surrender of any distinction between scientific argumentation and propaganda; or, for that matter, between science and religious dogma. But some restricted form of relativism, where some inquiries are viewed as resulting in objective knowledge, whereas others are held to express mere opinions, is possible.

Helen Longino has in her (2002) discussed these matters. She argues that the dichotomy between the rational and the social aspects of knowledge depends on some presuppositions that can be refuted.

A number of sociologists, for example Bruno Latour, have introduced the norm that sociologists ought to study societies and groups without taking a stance as to whether the claims of those societies are true or not: one should be impartial. This may seem to be a sympathetic view; that one should not act as a know-it-all and dictate as to who is right or wrong. If one agrees with this norm, then it follows that one cannot, in principle, distinguish between what is considered knowledge in the society under study and what actually is knowledge. This implies that one cannot appeal to factual circumstances when one wants to explain something within the society or culture being studied. Among other things, this means that one cannot explain the results of various decisions or behaviour by saying, for example, that it was based on a misunderstanding, since the idea of a misunderstanding presupposes the distinction between truth and falsity. This is, in all practicality, an unreasonable position.

2.8 The Expression 'It Is True for Me that...'

One sometimes hears people say that something is 'true for me', or 'it is true for her'. Obviously one wants to say something more than that he or she believes the proposition in question, otherwise, one would simply say that 'I believe that... ', or 'I believe that... is true'. When one says that '... is true', it is because one wants to claim something stronger; namely, that one's claim is not just a private opinion, but also that it is objectively true. So what is being said when one adds 'for me'? One gets the impression that the speaker initially wants to claim something more than a private opinion, but then later signals a retraction when he adds 'for me'. Thus, uttering the expression 'it is true for me' seems to be a pragmatic inconsistency. One is both making and taking back the claim that the utterance is objectively true.

There are, however, situations where the expression 'it is true for me' can be given a reasonable interpretation. I am thinking of a case where one talks about how one experiences a situation and wants to assert priority of one's own experience. An

example is the discussion that followed the publication of Jan Myrdal's⁴ autobiographical books *Childhood* and *Twelve Going on Thirteen*. In these books, Myrdal, a well-known Swedish author with well-known parents, presents his mother in a very unfavourable light. Myrdal describes himself as a boy longing for his mother's love and attention, which he hardly ever gets. Since his books came out, Myrdal's sisters have also published autobiographies in which Myrdal is presented as a terribly egoistic boy, who is always jealously manoeuvring to get his mother's undivided attention. In response to these claims Myrdal answered, 'It is my truth that I describe in my books.'

This answer is impossible to criticize. The only thing one can say is that it would have shown a sign of impartiality and self-awareness if this phrasing had been more clearly presented in his books. For example, Myrdal could have written, 'I *experienced* my mother as being false', instead of the infamous 'she was as false as a three-crown coin'. However, Myrdal can defend himself in that, in his books, he pointed out that it is his personal perspective that is being presented.

This example shows that, when the question regards how one should describe a social situation, one cannot ignore how the situation is experienced by those involved. One could, perhaps, defend Myrdal's parents with the argument that they did not in any obvious way deviate from the accepted norms of childcare of the time and culture, but this does not suffice. Suppose that Myrdal, with respect to both past and present day norms, was a horribly self-absorbed person, and that his parents engaged with him more than usual at that time. Would this imply that we could claim that he was wrong to portray his mother as such a mean and uncaring person in the description of his childhood experience? No, hardly. Questions regarding how an event is experienced and how some event actually unfolded are, in this case, the same question. The objective reality we want to describe is precisely how different people *perceive* their relations to one another.

There is reason here to make a distinction between two different senses of the objective-subjective contrast. The first sense is *epistemological*. It is that a claim is objectively true, or objectively false, if the truth or falsity of that claim does not depend on who makes the claim. Another sense of the objective-subjective contrast is *ontological*. A phenomenon, circumstance, event or object, in short, anything we can talk about, is objective in the ontological sense if its existence is independent of any individual's mental states. Otherwise, it is ontologically subjective. A person's attitudes, feelings and thoughts are subjective in the ontological sense. It follows that one can make objectively true or false claims about these phenomena, i.e., about subjective experiences.

What is the criterion for truth when we ask, 'what was the relationship between Jan Myrdal and his mother?' The only reasonable answer is to say that the truth about the relationship between mother and son, in this case, has to do with precisely

⁴ Jan Myrdal, born 1927, is in Sweden a well-known author and son of Gunnar and Alva Myrdal, both being well-known to the public. Gunnar Myrdal was awarded the nobel prize in economics 1974 and Alva Myrdal was active in the peace movement and member of the Swedish government.

the feelings they both had. If Myrdal actually had the feelings he purports to have had, then nothing more is required. It is an entirely separate question whether our memories of our feelings long ago are reliable. (It is well known that often they are not, but in this example I neglect this aspect.)

The question regarding what was actually the case is often connected to the question of what is responsible for Jan Myrdal's feelings of abandonment? Was it his mother's actions, or his own excessive need for attention?

The supplementary question 'Who is to blame?' shows that values play a substantial role when we describe social situations. It is yet another sign that one, on a conceptual basis, can hardly describe a social situation without making a value judgment. We usually distinguish between propositions regarding facts and propositions regarding values (propositions that express moral, judicial or aesthetic norms, as in when something is good, bad, right, wrong, beautiful, etc.) in that we usually say that propositions regarding facts are true or false, whereas propositions regarding values do not, at least on some views, have this property. Thus the conclusion is that in describing social relations, we often cannot distinguish between fact and value judgment on the basis that the concepts we use are more or less impregnated with values. The example of Jan Myrdal's relationship with his mother is typical in that the concepts used to talk about human relations, concepts such as 'unloving' and 'egocentric', are both descriptive and evaluative. In short, there hardly exist any concepts that are such that we can describe a social phenomenon without expressing values.

A means to attain the highest level of objectivity possible in describing social relations is to introduce a reference to a certain person's perspective. When we say that 'Jan Myrdal's mother neglected him' it sounds like an objective and, in principle, observable fact. But a more precise expression of the fact alluded to would clearly state that the situation regards particular experiences: 'Jan Myrdal experienced that his mother neglected him'. This reformulation is perhaps not a big step forward as regards determining the fact of the matter, but it does make clear the context of the situation; namely, how a relationship is experienced. Thus if someone says 'this is true for me', and by this means 'this is how I experience the situation', then there is nothing here to criticize, save perhaps that the expression hides an allusion to private experience. However, it should be noted that such propositions are true or false in the usual sense of 'stating it as it is'. Either it is the case that Myrdal had such an experience and the proposition is true, or it is the case that he did not and he has lied, or incorrectly remembered. If the latter, then the proposition is false. That it might be impossible for us to determine which is the case is irrelevant.

2.9 Knowledge of Religious Beliefs

It is sometimes claimed that one can indeed have knowledge of something without believing that something. An example of this is religious belief. Consider the belief that Jesus is God's son. One is here mixing together two very different things. If I say, 'I know that Jesus is God's son', then I cannot claim that I do not believe it, since 'I know' implies 'I believe'. Though, one can simultaneously hold that 'According to the Christian religion, Jesus is God's son' and 'I do not believe Jesus is God's son'. In other words, I can have knowledge of what the Christian religion claims and the various beliefs that Christians hold, without holding those beliefs myself. I do not then know that Jesus is God's son, but rather I merely know what certain other people believe.

The above example is merely a special case of the trivial fact that we can have (true) knowledge of what someone believes, even if the content of those beliefs is not believed by us, or are simply false.

2.10 Summary

The classical definition of knowledge is that it is a true justified belief. In other words, knowledge is a state of mind that is about the world, that it is true and such that good reasons can be given for the content of the belief. One may say that the concept of knowledge connects the subjective, the intersubjective and the objective aspect of a state of mind.

We accept in all empirical sciences, in everyday life and in the courts that a piece of evidence could be very good reason for a belief without providing a complete guarantee for truth. Hence, since there is no strict connection between good reason and truth, it may happen that we have very good reason for a false belief. And further, Gettier discovered that we may have good reasons for a true belief, but we still do not want to say that that belief constitutes knowledge; we believe the proposition for the wrong reason, it seems. This has inspired many philosophers to suggest an alternative definition of knowledge, viz. that it is a true belief, which is arrived at by a reliable procedure. The point is that the person who is attributed a piece of knowledge may not know that he/she in fact used a reliable process. The reasons he/she may give for the belief is not relevant.

So what is knowledge? Philosophers disagree; but they do not disagree about the truth-condition; a false belief cannot be knowledge.

Discussion Exercises

1. Detective Carl Blomkvist is investigating a murder. At the scene of the crime he finds a wallet containing a driver's license that belongs to a Pelle Persson. The detective seeks him out and discovers that Pelle Persson left town in a hurry. It just so happens that Pelle Persson has long been in conflict with the victim and had much to gain from the victim's death. Pelle Persson is arrested; under his

fingerprints the police find traces of the victim's blood. The police also find a large number of fingerprints belonging to Pelle Persson at the scene of the crime. There are no other suspects; and so Carl Blomkvist becomes convinced that Pelle Persson is the murderer.

In fact, Pelle Persson is not the murderer. Another person is, and he has succeeded in simultaneously hiding his involvement and framing Pelle Persson.

Does Carl Blomkvist know that Pelle Persson is the murderer?

2. In the 1500s, the geocentric worldview was still the established view. Among other things, this worldview enabled seafarers to determine their latitude when sailing on the open ocean by reference to the positions of the sun and other celestial bodies. Even though their worldview was not correct, their latitudinal calculations were.

When such a seafarer correctly believes that his latitude is x degrees on the basis of the instruments and techniques of the day, does he know it?

3. Lady G is on a walk in the inner city of London and is thinking about classic rock'n roll. She sees a man on a street corner that she has seen on TV many times, as well as in the newspapers. However, he looks a bit older than he did in the pictures she saw. She stares intently at the person and says to herself, 'My God, that is Elvis Presley! I saw him!'

In actuality, what Lady G tells herself is true. Elvis Presley is in fact living a quiet life in London, and it was just this person that she has met. However, at the time of this occurrence there is an Elvis Presley look-alike competition going on in London, so the city is crawling with Elvis impersonators. This event is well known and all over the tabloids, but Lady G does not read those papers and has no idea that the competition is taking place.

Does Lady G know that she saw Elvis Presley?

4. Doctor H prescribes medicine M to a patient P. This medicine has been carefully tested and has been used for 20 years with a 100 % success rate, and no side effects. Doctor H knows all of this when she writes out the prescription; she claims that it will cure the patient and it does. However, no one knows how medicine M works. It is a complete mystery.

Does Doctor H know that the patient will be cured?

5. Discuss the following propositions! Do you agree?
 - (a) A proposition can be true even though everyone thinks that it is false.
 - (b) A proposition can be true even though no one can give reasons for believing it.
 - (c) A proposition can be false even though one has good reasons for believing it is true.
 - (d) If one has good reasons for believing a proposition, then one knows it.
 - (e) If everyone considers a proposition to be true, then it is true.
 - (f) Many propositions that were true 500 years ago are now false.
 - (g) If one knows that a proposition is true, then it is true.
 - (h) If one knows that a proposition is true, then one believes it is true.
 - (i) If one believes that a proposition is true, then one knows that it is true.

- (j) 500 years ago, everyone knew that the earth was the centre of the universe, but now we know that the earth is not the centre of the universe.
- (k) There is nothing that we know for certain.

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<http://www.springer.com/978-3-319-26549-0>

Philosophy of Science for Scientists

Johansson, L.-G.

2016, XV, 257 p. 28 illus. in color., Hardcover

ISBN: 978-3-319-26549-0