



Criteria of truth

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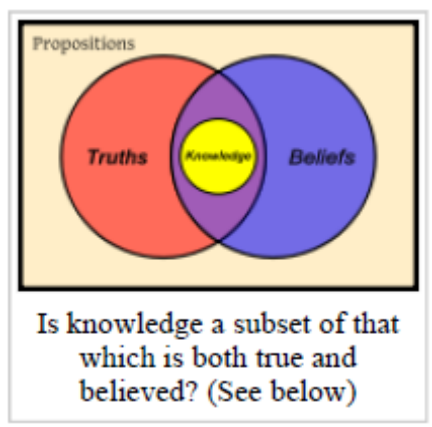
In [epistemology](#), **criteria of truth** (or **tests of truth**) are standards and rules used to judge the accuracy of statements and claims. They are tools of verification. Understanding a [philosophy's](#) criteria of [truth](#) is fundamental to a clear evaluation of that philosophy. This necessity is driven by the varying, and conflicting, claims of different philosophies. The rules of [logic](#) have no ability to distinguish truth on their own. An individual must determine what standards distinguish truth from [falsehood](#). Not all criteria are equally valid. Some standards are sufficient, while others are questionable.^[1]

There are three "primary truths" inherently accepted in the investigation of knowledge and truth. They are the first fact (the fact of our existence), the first principle (the principle of non-contradiction) and the first condition (the ability of the mind to know truth). They cannot be validated with positive proof, as they are an inherent in every analysis. As a demonstration of their a priori nature, a person objecting to these essential truths cannot set a standard of proof without implicitly accepting the premises.^[2]

Truth can only be attributed to judgments, which are expressed as propositions that note the degree, or lack, of agreement between two or more ideas. Arguments are made up of propositions. Arguments are never "true" or "false." The propositions making up the argument may be "true" or "false," but not the argument itself. An argument is either "valid" or "invalid." Every deductive argument is either valid or invalid. The conclusion may be true but invalid, but it is also possible for a conclusion to be false but valid. Truth is the agreement of a premise or judgment with reality. Contrastingly, validity is the adherence to rules of logic in the relationship between premises and conclusions. Only propositions are true or false, while deductive arguments are valid or invalid. Inductive arguments are neither valid nor invalid, but rather judged as having a certain probability.^[2]

Some truths (very few) are self-evident. They are immediately obvious, such as the three primary truths. However, truth is not usually self-apparent and must be proven through the medium of rational analysis. For example, the boiling point of water must be discovered and tested. The authority of scientists who performed such an experiment is usually accepted, but if they are doubted, the experiment can be recreated and the evidence of truth confirmed. To be of rational value, evidence must be objective. Jonathan Dolhenty posits that there are three possible sources of objective evidence: the evidence of the senses, the evidence of rational thought and the evidence of expert testimony. Dolhenty expresses the need for caution with expert accounts, stating that

there must be a willingness to challenge authority. He points out that experts have made errors, and even falsified evidence, on occasion.^[2]



Epistemology

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Epistemology (from Greek *ἐπιστήμη* - *episteme*-, "knowledge, science" + *λόγος*, "logos") or **theory of knowledge** is the branch of philosophy concerned with the nature and scope (limitations) of knowledge.[1] It addresses the questions:

- What is knowledge?
- How is knowledge acquired?
- What do people know?
- How do we know what we know?
- Why do we know what we know?

Much of the debate in this field has focused on analyzing the nature of knowledge and how it relates to similar notions such as truth, belief, and justification. It also deals with the means of production of knowledge, as well as skepticism about different knowledge claims.

The term was introduced into English by the Scottish philosopher

Knowledge

Distinguishing *knowing that* from *knowing how*

In this article, and in epistemology in general, the kind of knowledge usually discussed is propositional knowledge, also known as "knowledge-that" as opposed to "knowledge-

how." For example: in mathematics, it is known *that* $2 + 2 = 4$, but there is also knowing *how* to add two numbers. Many (but not all) philosophers therefore think there is an important distinction between "knowing that" and "knowing how", with epistemology primarily interested in the former. This distinction is recognized linguistically in many languages, though not in modern Standard English (N.B. some languages related to English still do retain these verbs, as in Scots: "wit" and "ken").[3]

In *Personal Knowledge*, Michael Polanyi articulates a case for the epistemological relevance of both forms of knowledge; using the example of the act of balance involved in riding a bicycle, he suggests that the theoretical knowledge of the physics involved in maintaining a state of balance cannot substitute for the practical knowledge of how to ride, and that it is important to understand how both are established and grounded.

In recent times, some epistemologists (Sosa, Greco, Kvanvig, Zagzebski) have argued that we should not think of knowledge this way. Epistemology should evaluate people's properties (i.e., intellectual virtues) instead of propositions' properties. This is, in short, because higher forms of cognitive success (i.e., understanding) involve features that can't be evaluated from a justified true belief view of knowledge.

Belief

Often, statements of "belief" mean that the speaker predicts something that will prove to be useful or successful in some sense—perhaps the speaker might believe in his or her favorite football team. This is not the kind of belief usually addressed within epistemology. The kind that *is* dealt with is when "to believe something" simply means any cognitive content held as true. For example, to believe that the sky is blue is to think that the proposition "The sky is blue" is true.

Knowledge entails belief, so the statement, "I know the sky is blue, but I don't believe it", is self-contradictory (see Moore's paradox). On the other hand, knowledge *about* a belief does not entail an endorsement of its truth. For example, "I know about astrology, but I don't believe in it" is perfectly acceptable. It is also possible that someone believes in astrology but knows virtually nothing about it.

Belief is a subjective personal basis for individual behavior, while truth is an objective state independent of the individual. On occasion, knowledge and belief can conflict producing "cognitive dissonance".

Truth

Whether someone's belief is true is not a prerequisite for someone to believe it. On the other hand, if something is actually *known*, then it categorically cannot be false. For example, a person believes that a particular bridge is safe enough to support them, and attempts to cross it; unfortunately, the bridge collapses under their weight. It could be said that they *believed* that the bridge was safe, but that this belief was mistaken. It would *not* be accurate to say that they *knew* that the bridge was safe, because plainly it was not. By contrast, if the bridge actually supported their weight then they might be justified in subsequently holding that he *knew* the bridge had been safe enough for his passage, at

least at that particular time. For something to count as knowledge, it must actually be true.

The Aristotelian definition of truth states:

"To say of something which is that it is not, or to say of something which is not that it is, is false. However, to say of something which is that it is, or of something which is not that it is not, is true."

Justification

Plato

In Plato's dialogue *Theaetetus*, Socrates considers a number of theories as to what knowledge is, the last being that knowledge is true belief that has been "given an account of"—meaning explained or defined in some way. According to the theory that knowledge is justified true belief, in order to know that a given proposition is true, one must not only believe the relevant true proposition, but one must also have a good reason for doing so. One implication of this would be that no one would gain knowledge just by believing something that happened to be true. For example, an ill person with no medical training, but a generally optimistic attitude, might believe that they will recover from their illness quickly.

Nevertheless, even if this belief turned out to be true, the patient would not have *known* that they would get well since their belief lacked justification. The definition of knowledge as justified true belief was widely accepted until the 1960s. At this time, a paper written by the American philosopher Edmund Gettier provoked widespread discussion. See theories of justification for other views on the idea.

The Gettier problem

In 1963 Edmund Gettier called into question the theory of knowledge that had been dominant among philosophers for thousands of years[4]. In a few pages, Gettier argued that there are situations in which one's belief may be justified and true, yet fail to count as knowledge. That is, Gettier contended that while justified belief in a proposition is necessary for that proposition to be known, it is not sufficient.

As in the diagram above, a true proposition can be believed by an individual (purple region) but still not fall within the "knowledge" category (yellow region).

According to Gettier, there are certain circumstances in which one does not have knowledge, even when all of the above conditions are met. Gettier proposed two thought experiments, which have come to be known as "Gettier cases," as counterexamples to the classical account of knowledge. One of the cases involves two men, Smith and Jones, who are awaiting the results of their applications for the same job. Each man has ten coins in his pocket. Smith has excellent reasons to believe that Jones will get the job and, furthermore, knows that Jones has ten coins in his pocket (he recently counted them).

From this Smith infers, "the man who will get the job has ten coins in his pocket."
However, Smith is unaware that he has ten coins in his own pocket.

Furthermore, Smith, not Jones, is going to get the job. While Smith has strong evidence to believe that Jones will get the job, he is wrong. Smith has a justified true belief that a man with ten coins in his pocket will get the job; however, according to Gettier, Smith does not *know* that a man with ten coins in his pocket will get the job, because Smith's belief is "...true by virtue of the number of coins in *Smith's* pocket, while Smith does not know how many coins are in Smith's pocket, and bases his belief...on a count of the coins in Jones's pocket, whom he falsely believes to be the man who will get the job." (see [4] p. 122.) These cases fail to be knowledge because the subject's belief is justified, but only happens to be true in virtue of luck.

Responses to Gettier

The responses to Gettier have been varied. Usually, they have involved substantive attempts to provide a definition of knowledge different from the classical one, either by recasting knowledge as justified true belief with some additional fourth condition, or as something else altogether.

Infallibilism, indefeasibility

In one response to Gettier, the American philosopher Richard Kirkham has argued that the only definition of knowledge that could ever be immune to all counterexamples is the infallibilist one. To qualify as an item of knowledge, so the theory goes, a belief must not only be true and justified, the justification of the belief must *necessitate* its truth. In other words, the justification for the belief must be infallible. (See *Fallibilism*, below, for more information.)

Yet another possible candidate for the fourth condition of knowledge is *indefeasibility*. Defeasibility theory maintains that there should be no overriding or defeating truths for the reasons that justify one's belief. For example, suppose that person *S* believes he saw Tom Grabbit steal a book from the library and uses this to justify the claim that Tom Grabbit stole a book from the library. A possible defeater or overriding proposition for such a claim could be a true proposition like, "Tom Grabbit's identical twin Sam is currently in the same town as Tom." So long as no defeaters of one's justification exist, a subject would be epistemically justified.

The Indian philosopher B K Matilal has drawn on the Navya-Nyaya fallibilism tradition to respond to the Gettier problem. Nyaya theory distinguishes between *know p* and *know that one knows p* - these are different events, with different causal conditions. The second level is a sort of implicit inference that usually follows immediately the episode of knowing *p* (knowledge *simpliciter*). The Gettier case is analyzed by referring to a view of Gangesha (13th c.), who takes any true belief to be knowledge; thus a true belief acquired through a wrong route may just be regarded as knowledge *simpliciter* on this view.

The question of justification arises only at the second level, when one considers the knowledgehood of the acquired belief. Initially, there is lack of uncertainty, so it becomes

a true belief. But at the very next moment, when the hearer is about to embark upon the venture of knowing whether he *knows p*, doubts may arise. "If, in some Gettier-like cases, I am wrong in my inference about the knowledgehood of the given occurrent belief (for the evidence may be pseudo-evidence), then I am mistaken about the truth of my belief -- and this is in accord with Nyaya fallibilism: not all knowledge-claims can be sustained." [5]

Reliabilism

Reliabilism is a theory that suggests a belief is justified (or otherwise supported in such a way as to count towards knowledge) only if it is produced by processes that typically yield a sufficiently high ratio of true to false beliefs. In other words, this theory states that a true belief counts as knowledge only if it is produced by a reliable belief-forming process.

Reliabilism has been challenged by Gettier cases. Another argument that challenges reliabilism, like the Gettier cases (although it was not presented in the same short article as the Gettier cases), is the case of Henry and the barn façades. In the thought experiment, a man, Henry, is driving along and sees a number of buildings that resemble barns. Based on his perception of one of these, he concludes that he has just seen barns. While he has seen one, and the perception he based his belief on was of a real barn, all the other barn-like buildings he saw were façades. Theoretically, Henry doesn't know that he has seen a barn, despite both his belief that he has seen one being true and his belief being formed on the basis of a reliable process (i.e. his vision), since he only acquired his true belief by accident.

Other responses

The American philosopher Robert Nozick has offered the following definition of knowledge:

S knows that *P* if and only if:

- *P*;
- *S* believes that *P*;
- if *P* were false, *S* would not believe that *P*;
- if *P* is true, *S* will believe that *P*. [6]

Nozick believed that the third subjunctive condition served to address cases of the sort described by Gettier. Nozick further claims this condition addresses a case of the sort described by D. M. Armstrong

[7]: A father believes his son innocent of committing a particular crime, both because of faith in his son and (now) because he has seen presented in the courtroom a conclusive demonstration of his son's innocence. His belief via the method of the courtroom satisfies the four subjunctive conditions, but his faith-based belief does not. If his son were guilty, he would still believe him innocent, on the basis of faith in his son; this would violate the third subjunctive condition.

The British philosopher Simon Blackburn has criticized this formulation by suggesting that we do not want to accept as knowledge beliefs which, while they "track the truth" (as Nozick's account requires), are not held for appropriate reasons. He says that "we do not want to award the title of knowing something to someone who is only meeting the conditions through a defect, flaw, or failure, compared with someone else who is not meeting the conditions." In addition to this, externalist accounts of knowledge, like Nozick's, are often forced to reject closure in cases where it is intuitively valid.

Timothy Williamson, has advanced a theory of knowledge according to which knowledge is not justified true belief plus some extra condition(s). In his book *Knowledge and its Limits*, Williamson argues that the concept of knowledge cannot be analyzed into a set of other concepts—instead, it is *sui generis*.

Thus, though knowledge requires justification, truth, and belief, the word "knowledge" can't be, according to Williamson's theory, accurately regarded as simply shorthand for "justified true belief."

Externalism and internalism

Part of the debate over the nature of knowledge is a debate between epistemological externalists on the one hand, and epistemological internalists on the other. Externalists think that factors deemed "external", meaning outside of the psychological states of those who gain knowledge, can be conditions of knowledge. For example, an externalist response to the Gettier problem is to say that, in order for a justified, true belief to count as knowledge, it must be caused, in the right sort of way, by relevant facts.

Such causation, to the extent that it is "outside" the mind, would count as an external, knowledgeyielding condition. Internalists, contrariwise, claim that all knowledgeyielding conditions are within the psychological states of those who gain knowledge.

René Descartes, prominent philosopher and supporter of internalism wrote that, since the only method by which we perceive the external world is through our senses, and that, since the senses are not infallible, we should not consider our concept of knowledge to be infallible. The only way to find anything that could be described as "infallibly true," he advocates, would be to pretend that an omnipotent, deceitful being is tampering with one's perception of the universe, and that the logical thing to do is to question anything that involves the senses. "Cogito ergo sum" (I think, therefore I am) is commonly associated with Descartes' theory, because he postulated that the only thing that he could not logically bring himself to doubt is his own existence: "I do not exist" is a contradiction in terms; the act of saying that one does not exist assumes that someone must be making the statement in the first place.

Though Descartes could doubt his senses, his body and the world around him, he could not deny his own existence, because he was able to doubt and must exist in order to do so. Even if some "evil genius" were to be deceiving him, he would have to exist in order to be deceived. However from this Descartes did not go as far as to define what he was. This was pointed out by the materialist philosopher Pierre Gassendi (1592-1655) who

accused Descartes of saying that he was "not this and not that," while never saying what exactly was existing. One could argue that this is not an edifying question, because it doesn't matter what exactly exists, it only matters that it does indeed exist.

Acquiring knowledge

The second question that will be dealt with is the question of how knowledge is acquired. This area of epistemology covers:

1. Issues concerning epistemic distinctions such as that between experience and *a priori* as means of creating knowledge.
2. Further that between synthesis and analysis used as a means of proof
3. Debates such as the one between empiricists and rationalists.
4. What is called "the regress problem"

A priori and a posteriori knowledge

The nature of this distinction has been disputed by various philosophers; however, the terms may be roughly defined as follows:

- *A priori* knowledge is knowledge that is known independently of experience (that is, it is nonempirical, or arrived at beforehand).
- *A posteriori* knowledge is knowledge that is known by experience (that is, it is empirical)

Analytic/synthetic distinction

Some propositions are such that we appear to be justified in believing them just so far as we understand their meaning. For example, consider, "My father's brother is my uncle." We seem to be justified in believing it to be true by virtue of our knowledge of what its terms mean. Philosophers call such propositions "analytic." Synthetic propositions, on the other hand, have distinct subjects and predicates.

An example of a synthetic proposition would be, "My father's brother has black hair." Kant held that all mathematical propositions are synthetic.

The American philosopher W. V. O. Quine, in his "Two Dogmas of Empiricism," famously challenged the distinction, arguing that the two have a blurry boundary.

Specific theories of knowledge acquisition

Empiricism

In philosophy, empiricism is generally a theory of knowledge emphasizing the role of experience, especially experience based on perceptual observations by the five senses. Certain forms treat all knowledge as empirical, while some regard disciplines such as mathematics, economics and logic as exceptions.

Rationalism

Rationalists believe that knowledge is primarily (at least in some areas) acquired by *a priori* processes or is innate—for example, in the form of concepts not derived from experience. The relevant theoretical processes often go by the name "intuition". The relevant theoretical concepts may purportedly be part of the structure of the human mind (as in Kant's theory of transcendental idealism), or they may be said to exist independently of the mind (as in Plato's theory of Forms).

The extent to which this innate human knowledge is emphasized over experience as a means to acquire knowledge varies from rationalist to rationalist. Some hold that knowledge of any kind can only be gained *a priori*, while others claim that some knowledge can also be gained *a posteriori*. Consequently, the borderline between rationalist epistemologies and others can be vague.

Constructivism

Constructivism is a view in philosophy according to which all knowledge is "constructed" in as much as it is contingent on convention, human perception, and social experience. Constructivism proposes new definitions for knowledge and truth that forms a new paradigm, based on inter-subjectivity instead of the classical objectivity and viability instead of truth. Piagetian constructivism, however, believes in objectivity as constructs can be validated through experimentation. The constructivist point of view is pragmatic as Vico said: "the truth is to have made it."

It originated in sociology under the term "social constructionism" and has been given the name "constructivism" when referring to philosophical epistemology, though "constructionism" and "constructivism" are often used interchangeably. Constructivism has also emerged in the field of International Relations, of which the writings of Alexander Wendt are most popular. Describing the characteristic nature of International reality marked by 'anarchy' he says, "anarchy is what states make of Epistemology

The regress problem

Suppose we make a point of asking for a justification for every belief. Any given justification will itself depend on another belief for its justification, so one can also reasonably ask for this to be justified, and so forth. This appears to lead to an infinite regress, with each belief justified by some further belief. The apparent impossibility of completing an infinite chain of reasoning is thought by some to support skepticism. The skeptic will argue that since no one can complete such a chain, ultimately no beliefs are justified and, therefore, no one knows anything. "The only thing I know for sure is that I do not know for sure."

Response to the regress problem

Many epistemologists studying justification have attempted to argue for various types of chains of reasoning that can escape the regress problem.

Infinetism

It is not impossible for an infinite justificatory series to exist. This position is known as "infinetism."

Infinetists typically take the infinite series to be merely potential, in the sense that an individual may have indefinitely many reasons available to him, without having consciously thought through all of these reasons when the need arises. This position is motivated in part by the desire to avoid what is seen as the arbitrariness and circularity of its chief competitors, foundationalism and coherentism.

Foundationalism

Foundationalists respond to the regress problem by claiming that some beliefs that support other beliefs do not themselves require justification by other beliefs. Sometimes, these beliefs, labeled "foundational," are characterized as beliefs of whose truth one is directly aware, or as beliefs that are self-justifying, or as beliefs that are infallible. According to one particularly permissive form of foundationalism, a belief may count as foundational, in the sense that it may be presumed true until defeating evidence appears, as long as the belief seems to its believer to be true. Others have argued that a belief is justified if it is based on perception or certain *a priori* considerations.

The chief criticism of foundationalism is that it allegedly leads to the arbitrary or unjustified acceptance of certain beliefs.[8]

Coherentism

Another response to the regress problem is coherentism, which is the rejection of the assumption that the regress proceeds according to a pattern of linear justification. To avoid the charge of circularity, coherentists hold that an individual belief is justified circularly by the way it fits together (coheres) with the rest of the belief system of which it is a part. This theory has the advantage of avoiding the infinite regress without claiming special, possibly arbitrary status for some particular class of beliefs. Yet, since a system can be coherent while also being wrong, coherentists face the difficulty in ensuring that the whole system corresponds to reality.

Foundherentism

There is also a position known as "foundherentism". Susan Haack is the philosopher who conceived it, and it is meant to be a unification of foundationalism and coherentism. One component of this theory is what is called the "analogy of the crossword puzzle." Whereas, say, infinists regard the regress of reasons as "shaped" like a single line, Susan Haack has argued that it is more like a crossword puzzle, with multiple lines mutually supporting each other.[9]

What do people know?

The last question that will be dealt with is the question of what people know. At the heart of this area of study is skepticism, with many approaches involved trying to disprove some particular form of it.

Skepticism

Skepticism is related to the question of whether certain knowledge is possible. Skeptics argue that the belief in something does not necessarily justify an assertion of knowledge of it. In this skeptics oppose foundationalism, which states that there have to be some basic beliefs that are justified without reference to others. The skeptical response to this can take several approaches. First, claiming that "basic beliefs" must exist, amounts to the logical fallacy of argument from ignorance combined with the slippery slope.

While a foundationalist would use Münchhausen Trilemma as a justification for demanding the validity of basic beliefs, a skeptic would see no problem with admitting the result.

Developments from skepticism

Fallibilism

For most of philosophical history, "knowledge" was taken to mean belief that was true and justified to an absolute certainty. Early in the 20th century, however, the notion that belief had to be justified as such to count as knowledge lost favour. Fallibilism is the view that knowing something does not entail certainty regarding it.

Charles Sanders Peirce was a fallibilist and the most developed form of fallibilism can be traced to Karl Popper (1902-1994) whose first book *Logik Der Forschung* (The Logic of Investigation), 1934 introduced a "conjectural turn" into the philosophy of science and epistemology at large. He adumbrated a school of thought that is known as Critical Rationalism with a central tenet being the rejection of the idea that knowledge can ever be justified in the strong form that is sought by most schools of thought.

His two most helpful exponents are the late William W Bartley and David Miller, recently retired from the University of Warwick. A major source of on-line material is the Critical Rationalist website and also the Rathouse of Rafe Champion.

James Frederick Ferrier (1808–1864).^[2]



Truth

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Time Saving Truth from Falsehood and Envy, [François Lemoyne](#), 1737
For other uses, see [Truth \(disambiguation\)](#).

The [meaning](#) of the word **truth** extends from [honesty](#), [good faith](#), and [sincerity](#) in general, to agreement with [fact](#) or [reality](#) in particular.^[1] The term has no single [definition](#) about which a majority of professional philosophers and scholars agree, and various [theories](#) of truth continue to be debated. There are differing claims on such questions as what constitutes truth; how to define and identify truth; the roles that revealed and acquired knowledge play; and whether truth is [subjective](#), [relative](#), [objective](#), or [absolute](#). This article introduces the various [perspectives](#) and claims, both today and throughout history.

The major theories of truth

The question of what is a proper basis for deciding how words, symbols, ideas and beliefs may properly be considered true, whether by a single person or an entire society, is dealt with by the five major substantive theories introduced below. Each theory presents perspectives that are widely shared by published scholars.^{[5][6]} There also have more recently arisen "[deflationary](#)" or "minimalist" theories of truth based on the idea that the application of a term like *true* to a statement does not assert anything significant about it, for instance, anything about its *nature*, but that the label *truth* is a tool of discourse used to express agreement, to emphasize claims, or to form certain types of generalizations.

Correspondence theory

Correspondence theories state that true beliefs and true statements correspond to the actual state of affairs.^[9] This type of theory posits a relationship between thoughts or statements on the one hand, and things or objects on the other. It is a traditional model which goes back at least to some of the classical Greek philosophers such as [Socrates](#), [Plato](#), and [Aristotle](#).^[10] This class of theories holds that the truth or the falsity of a representation is determined in principle solely by how it relates to "things", by whether it accurately describes those "things". An example of correspondence theory is the statement by the Thirteenth Century philosopher/theologian [Thomas Aquinas](#): *Veritas est adaequatio rei et intellectus* ("Truth is the equation [or adequation] of thing and intellect"), a statement which Aquinas attributed to the Ninth Century [neoplatonist Isaac Israeli](#).^{[11][12]} Aquinas also restated the theory as: "A judgment is said to be true when it conforms to the external reality"^[13]

Correspondence theory practically operates on the assumption that truth is a matter of accurately copying what was much later called "[objective reality](#)" and then representing it in thoughts, words and other symbols.^[14] Many modern theorists have stated that this ideal cannot be achieved independently of some analysis of additional factors.^{[5][15]} For example, language plays a role in that all languages have words that are not easily translatable into another. The [German](#) word *Zeitgeist* is one such example: one who speaks or understands the language may "know" what it means, but any translation of the word fails to accurately capture its full meaning (this is a problem with many abstract words, especially those derived in [agglutinative languages](#)). Thus, the language itself adds an additional parameter to the construction of an accurate [truth predicate](#). Among the philosophers who grappled with this problem is [Alfred Tarski](#), whose [semantic theory](#) is summarized further below in this article.^[16]

Proponents of several of the theories below have gone farther to assert that there are yet other issues necessary to the analysis, such as interpersonal power struggles, community interactions, personal biases and other factors involved in deciding what is seen as truth.

Coherence theory

For coherence theories in general, truth requires a proper fit of elements within a whole system. Very often, though, coherence is taken to imply something more than simple logical consistency; often there is a demand that the propositions in a coherent system lend mutual inferential support to each other. So, for example, the completeness and comprehensiveness of the underlying set of concepts is a critical factor in judging the validity and usefulness of a coherent system.^[17] A pervasive tenet of coherence theories is the idea that truth is primarily a property of whole systems of propositions, and can be ascribed to individual propositions only according to their coherence with the whole. Among the assortment of perspectives commonly regarded as coherence theory, theorists differ on the question of whether coherence entails many possible true systems of thought or only a single absolute system.

Some variants of coherence theory are claimed to characterize the essential and intrinsic properties of [formal systems](#) in logic and mathematics.^[18] However, formal reasoners are content to contemplate [axiomatically independent](#) and sometimes mutually contradictory systems side by side, for example, the various [alternative geometries](#). On the whole, coherence theories have been criticized as lacking justification in their application to other areas of truth, especially with respect to assertions about the [natural world](#), [empirical](#) data in general, assertions about practical matters of psychology and society, especially when used without support from the other major theories of truth.^[19]

Coherence theories distinguish the thought of [rationalist](#) philosophers, particularly of [Spinoza](#), [Leibniz](#), and [G.W.F. Hegel](#), along with the British philosopher [F.H. Bradley](#).^[20] They have found a resurgence also among several proponents of [logical positivism](#), notably [Otto Neurath](#) and [Carl Hempel](#).

Constructivist theory

[Social constructivism](#) holds that truth is constructed by social processes, is historically and culturally specific, and that it is in part shaped through the power struggles within a community. Constructivism views all of our knowledge as "constructed," because it does not reflect any external "transcendent" realities (as a pure correspondence theory might hold). Rather, perceptions of truth are viewed as contingent on convention, human perception, and social experience. It is believed by constructivists that representations of physical and biological reality, including [race](#), [sexuality](#), and [gender](#) are socially constructed. [Giambattista Vico](#) was among the first to claim that history and culture were man-made. Vico's [epistemological](#) orientation gathers the most diverse rays and unfolds in one axiom--*verum ipsum factum*--"truth itself is constructed." [Hegel](#), [Garns](#), and [Marx](#) were among the other early proponents of the premise that truth is socially constructed.

Consensus theory

[Consensus theory](#) holds that truth is whatever is agreed upon, or in some versions, might come to be agreed upon, by some specified group. Such a group might include all human beings, or a [subset](#) thereof consisting of more than one person.

Among the current advocates of consensus theory as a useful accounting of the concept of "truth" is the philosopher [Jürgen Habermas](#).^[21] Habermas maintains that truth is what would be agreed upon in an ideal speech situation.^[22] Among the current strong critics of consensus theory is the philosopher [Nicholas Rescher](#).^[23]

Pragmatic theory

The three most influential forms of the *pragmatic theory of truth* were introduced around the turn of the 20th century by [Charles S. Peirce](#), [William James](#), and [John Dewey](#). Although there are wide differences in viewpoint among these and other proponents of pragmatic theory, they hold in common that truth is verified and confirmed by the results of putting one's concepts into practice.^[24]

[Peirce](#) defines truth as follows: "Truth is that concordance of an abstract statement with the ideal limit towards which endless investigation would tend to bring scientific belief, which concordance the abstract statement may possess by virtue of the confession of its inaccuracy and one-sidedness, and this confession is an essential ingredient of truth."^[25] This statement emphasizes Peirce's view that ideas of approximation, incompleteness, and partiality, what he describes elsewhere as *fallibilism* and "reference to the future", are essential to a proper conception of truth. Although Peirce uses words like *concordance* and *correspondence* to describe one aspect of the pragmatic [sign relation](#), he is also quite explicit in saying that definitions of truth based on mere correspondence are no more than *nominal* definitions, which he accords a lower status than *real* definitions.

[William James](#)'s version of pragmatic theory, while complex, is often summarized by his statement that "the 'true' is only the expedient in our way of thinking, just as the 'right' is only the expedient in our way of behaving."^[26] By this, James meant that truth is a quality the value of which is confirmed by its effectiveness when applying concepts to actual practice (thus, "pragmatic").

[John Dewey](#), less broadly than James but more broadly than Peirce, held that inquiry, whether scientific, technical, sociological, philosophical or cultural, is self-corrective over time *if* openly submitted for testing by a community of inquirers in order to clarify, justify, refine and/or refute proposed truths.^[27]

Minimalist (deflationary) theories

A number of philosophers reject the thesis that the concept or term *truth* refers to a real property of sentences or propositions. These philosophers are responding, in part, to the common use of *truth predicates* (e.g., that some particular thing "...is true") which was particularly prevalent in philosophical discourse on truth in the first half of the 20th century. From this point of view, to assert the proposition "2 + 2 = 4 is true" is logically equivalent to asserting the proposition "2 + 2 = 4", and the phrase "is true" is completely dispensable in this and every other context. These positions are broadly described

- as *deflationary* theories of truth, since they attempt to deflate the presumed importance of the words "true" or *truth*,
- as *disquotational* theories, to draw attention to the disappearance of the quotation marks in cases like the above example, or
- as *minimalist* theories of truth.^{[28][5]}

Whichever term is used, deflationary theories can be said to hold in common that "[t]he predicate 'true' is an expressive convenience, not the name of a property requiring deep analysis."^[5] Once we have identified the truth predicate's formal features and utility, deflationists argue, we have said all there is to be said about truth. Among the theoretical concerns of these views is to explain away those special cases where it *does* appear that the concept of truth has peculiar and interesting properties. (See, e.g., [Semantic paradoxes](#), and below.)

In addition to highlighting such formal aspects of the predicate "is true", some deflationists point out that the concept enables us to express things that might otherwise require infinitely long sentences. For example, one cannot express confidence in Michael's accuracy by asserting the endless sentence:

Michael says, 'snow is white' and snow is white, or he says 'roses are red' and roses are red or he says ... etc.

But it can be expressed succinctly by saying: *What Michael says is true.*^[29]

Performative theory of truth

Attributed to [P. F. Strawson](#) is the performative theory of truth which holds that to say "'Snow is white' is true" is to perform the [speech act](#) of signaling one's agreement with the claim that snow is white (much like nodding one's head in agreement). The idea that some statements are more actions than communicative statements is not as odd as it may seem. Consider, for example, that when the bride says "I do" at the appropriate time in a wedding, she is performing the act of taking this man to be her lawful wedded husband. She is not *describing* herself as taking this man. In a similar way, Strawson holds: "To say a statement is true is not to make a statement about a statement, but rather to perform the act of agreeing with, accepting, or endorsing a statement. When one says 'It's true that it's raining,' one asserts no more than 'It's raining.' The function of [the statement] 'It's true that...' is to agree with, accept, or endorse the statement that 'it's raining.'"^[30]

Redundancy and related theories

According to the [redundancy theory of truth](#), asserting that a statement is true is completely equivalent to asserting the statement itself. For example, making the assertion that "'Snow is white' is true" is equivalent to asserting "Snow is white". Redundancy theorists infer from this premise that truth is a redundant concept; that is, it is merely a word that is traditionally used in conversation or writing, generally for emphasis, but not a word that actually equates to anything in reality. This theory is commonly attributed to [Frank P. Ramsey](#), who held that the use of words like *fact* and *truth* was nothing but a [roundabout](#) way of asserting a proposition, and that treating these words as separate problems in isolation from judgment was merely a "linguistic muddle".^{[31][32][33]}

A variant of redundancy theory is the disquotational theory which uses a modified form of [Tarski's schema](#): To say that "'P' is true" is to say that P. Yet another version of deflationism is the [prosentential theory of truth](#), first developed by Dorothy Grover, Joseph Camp, and [Nuel Belnap](#) as an elaboration of Ramsey's claims. They argue that sentences like "That's true", when said in response to "It's raining", are [prosentences](#), expressions that merely repeat the content of other expressions. In the same way that *it* means the same as *my dog* in the sentence *My dog was hungry, so I fed it, That's true* is supposed to mean the same as *It's raining* — if you say the latter and I then say the former. These variations do not necessarily follow Ramsey in asserting that truth is *not* a property, but rather can be understood to say that, for instance, the assertion "P" may well

involve a substantial truth, and the theorists in this case are minimalizing only the redundancy or prosentence involved in the statement such as "that's true."^[5]

Deflationary principles do not apply to representations that are not analogous to sentences, and also do not apply to many other things that are commonly judged to be true or otherwise. Consider the analogy between the sentence "Snow is white" and the character named Snow White, both of which can be true in some sense. To a minimalist, saying "Snow is white is true" is the same as saying "Snow is white," but to say "Snow White is true" is *not* the same as saying "Snow White."

Truth in logic

A *logical truth* (also called an *analytic truth* or a *necessary truth*) is a statement which is true in all possible worlds^[34] or under all possible [interpretations](#), as contrasted to a *synthetic claim* (or *fact*) which is only true in *this* world as it has historically unfolded. Logical truths are *necessarily* true. A [proposition](#) such as "If p and q, then p." and the proposition "All husbands are married." are considered to be logical truths because they are true because of their [meanings](#) and not because of any facts of the world. They are such that they could not be untrue.

[Logic](#) is concerned with the patterns in [reason](#) that can help tell us if a [proposition](#) is true or not. However, logic does not deal with truth in the absolute sense, as for instance a [metaphysician](#) does. Logicians use [formal languages](#) to express the truths which they are concerned with, and as such there is only truth *under some* [interpretation](#) or truth *within some* [logical system](#).

Truth in mathematics

There are two main approaches to truth in mathematics. They are the [model theory of truth](#) and the [proof theory of truth](#).

Historically, with the nineteenth century development of [Boolean algebra](#) mathematical models of logic began to treat "truth", also represented as "T" or "1", as an arbitrary constant. "Falsity" is also an arbitrary constant, which can be represented as "F" or "0". In [propositional logic](#), these symbols can be manipulated according to a set of [axioms](#) and [rules of inference](#), often given in the form of [truth tables](#).

In addition, from at least the time of [Hilbert's program](#) at the turn of the twentieth century to the proof of [Gödel's theorem](#) and the development of the [Church-Turing thesis](#) in the early part of that century, true statements in mathematics were generally assumed to be those statements which are provable in a formal axiomatic system.

The works of [Kurt Gödel](#), [Alan Turing](#), and others shook this assumption, with the development of statements that are true but cannot be proven within the system.^[35] Two examples of the latter can be found in [Hilbert's problems](#). Work on [Hilbert's 10th problem](#) led in the late twentieth century to the construction of specific [Diophantine equations](#) for

which it is undecidable whether they have a solution,^[36] or even if they do, whether they have a finite or infinite number of solutions. More fundamentally, [Hilbert's first problem](#) was on the [continuum hypothesis](#).^[37] Gödel and [Paul Cohen](#) showed that this hypothesis cannot be proved or disproved using the standard [axioms](#) of [set theory](#) and a finite number of proof steps.^[38] In the view of some, then, it is equally reasonable to take either the continuum hypothesis or its negation as a new axiom.

Semantic theory of truth

The [semantic theory of truth](#) has as its general case for a given language:

'P' is true if and only if P

where 'P' is a reference to the sentence (the sentence's name), and P is just the sentence itself.

Logician and philosopher [Alfred Tarski](#) developed the theory for formal languages (such as [formal logic](#)). Here he restricted it in this way: no language could contain its own truth predicate, that is, the expression *is true* could only apply to sentences in some other language. The latter he called an *object language*, the language being talked about. (It may, in turn, have a truth predicate that can be applied to sentences in still another language.) The reason for his restriction was that languages that contain their own truth predicate will contain paradoxical sentences like the Liar: *This sentence is not true*. See [The Liar paradox](#). As a result Tarski held that the semantic theory could not be applied to any natural language, such as English, because they contain their own truth predicates. [Donald Davidson](#) used it as the foundation of his [truth-conditional semantics](#) and linked it to [radical interpretation](#) in a form of [coherentism](#).

[Bertrand Russell](#) is credited with noticing the existence of such paradoxes even in the best symbolic formalizations of mathematics in his day, in particular the paradox that came to be named after him, [Russell's paradox](#). Russell and [Whitehead](#) attempted to solve these problems in [Principia Mathematica](#) by putting statements into a hierarchy of [types](#), wherein a statement cannot refer to itself, but only to statements lower in the hierarchy. This in turn led to new orders of difficulty regarding the precise natures of types and the structures of conceptually possible [type systems](#) that have yet to be resolved to this day.

Kripke's theory of truth

[Saul Kripke](#) contends that a natural language can in fact contain its own truth predicate without giving rise to contradiction. He showed how to construct one as follows:

- Begin with a subset of sentences of a natural language that contains no occurrences of the expression "is true" (or "is false"). So *The barn is big* is included in the subset, but not "*The barn is big is true*", nor problematic sentences such as "*This sentence is false*".

- Define truth just for the sentences in that subset.
- Then extend the definition of truth to include sentences that predicate truth or falsity of one of the original subset of sentences. So "*The barn is big* is true" is now included, but not either "*This sentence* is false" nor "'*The barn is big* is true' is true".
- Next, define truth for all sentences that predicate truth or falsity of a member of the second set. Imagine this process repeated infinitely, so that truth is defined for *The barn is big*; then for "*The barn is big* is true"; then for "'*The barn is big* is true' is true", and so on.

Notice that truth never gets defined for sentences like *This sentence is false*, since it was not in the original subset and does not predicate truth of any sentence in the original or any subsequent set. In Kripke's terms, these are "ungrounded." Since these sentences are never assigned either truth or falsehood even if the process is carried out infinitely, Kripke's theory implies that some sentences are neither true nor false. This contradicts the [Principle of bivalence](#): every sentence must be either true or false. Since this principle is a key premise in deriving the Liar paradox, the paradox is dissolved.^[39]