

On the nature of truth

and how the authors perceive it

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1 Introduction

Ever since, mankind has been accumulating knowledge by individual pursuit and exchange throughout generations. Knowledge is a concept we use on a day-to-day basis and ironically everyone seems to know what knowledge means and what it implies. Yet it is not very clear what knowledge is and how to define it, let alone that there might be right or true knowledge and false or wrong knowledge. A proper definition of knowledge could be a justified true belief, which is defined according to the following conditions:

S knows that p iff

- i. p is true;
- ii. S believes that p ;
- iii. S is justified in believing that p .

At this point one can mention a thought experiment of Bertrand Russel:

Imagine you arrive at a train station and look at the clock at the train station. You see it is 3 o'clock and, in fact, it is 3 o'clock. Now also imagine the clock stopped working exactly 12 hours ago. Saying that you know what time it is, because the clock at the train station showed 3 o'clock is a pretty well justified argument. If there is a clock you can use to justify such a belief, the train station clock is a very good choice. Your belief that it is 3 o'clock is on top of that true, it actually is 3 o'clock. But did you actually know that it is 3 o'clock? As the clock on the train station is broken, it is not really a justified belief anymore.

With this example you could think that the definition of knowledge as justified true belief is not good or sufficient, since the justification is questionable. We on the other hand do not want to engage in the discussion of justification, or what it means to know. We want to focus on the first condition: where does truth come from?

2 Interpretations of truth

The pursuit for truth can be considered an essential objective of mankind's scientific efforts. Since to know what is true requires a truth and a justification, where science is the means of justifying this truth. Those involved in this demanding endeavor will sooner or later have to ask the question what this truth they wish to justify actually is or where it comes from. The answer to this question does not reveal itself effortlessly and any attempt to find it could actually be paradoxical, since any description of the truth should satisfy its own conditions. Nevertheless a number of attempts have been made by various bright minds at describing the nature of truth. The following paragraphs introduce the two most significant and conflicting interpretations found in literature, including their necessary assumptions and limitations. These two interpretations are the 'coherence' and 'correspondence theory of truth. A third alternative interpretation called 'pragmatism' is also considered.

2.1 Neo-classical interpretations

The question about what is truth goes back to ancient times as it is so fundamental to the idea of knowledge. We will focus on two classical interpretations of truth, even though we will mention three of them in this coming part. Numerous sub variants and alternative theories exist, but these will not be discussed in this essay.

2.2 Correspondence

The first theory which attempts to describe the nature of truth is ubiquitous in historic literature. As implied by the name, this theory seeks to correspond the truth or falsity of a proposition to a portion of reality. One of the earliest definitions can be traced back to Aristotle as:

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

This definition already raises numerous ontological questions since it depends heavily on what it means to be or to exist. A more modern version is formally stated by Russell and Moore as:

Thus a belief is true when there is a corresponding fact, and is false when there is no corresponding fact. (Russell 1971 [1912]: 129)

To say that this belief is true is to say that there is in the universe a fact to which it corresponds; and to say that it is false is to say that there is not in the universe any fact to which it corresponds. (Moore 1953 [1910–11]: 277)

These definitions already seem to imply an important assumption accompanying the correspondence theory by requiring 'facts' and a 'universe'. These terms would generally

refer to a metaphysical assumption of realism which assumes a mind-independent existence of reality. This definition and the assumption of realism will be discussed more extensively in a later paragraph. Naturally, criticizing the correspondence theory can be done by doubting the assumption of realism. More specifically, one could ask for some description of the reality that it corresponds to. If this reality is not or barely described, the truth emerges from something ambiguous. However, once a description is attempted this description will be built on the assumption of the correspondence theory leading to a circular argument. To elaborate, you can describe a reality, but the validity of that description is dependent on that same reality that it describes. In opposition to the correspondence theory stands the coherence theory, which is described in the next section.

2.3 Coherence theory

The main reason that this theory opposes the correspondence theory is its anti-realistic nature as it does not necessarily assume the existence of an objective reality. The truth value of a proposition is then dictated by its relation to other propositions and their truth values. The essential idea is that all true propositions are coherent with one another, such that the truth arises from this coherence. Truth in the coherence theory states that individual beliefs or judgements get their content only in virtue of being part of a system of judgments, of a significant whole. This can be read in a work from Joachim as:

Truth in its essential nature is that systematic coherence which is the character of a significant whole. (Joachim 1906)

More formally:

A belief is true if and only if it is part of a coherent system of beliefs.

A proposition is true if it is the content of a belief in the system or entailed by a belief in the system. Whether the world provides a suitable object to reflect the proposition is of no concern, as it only matters how the beliefs relate to each-other.

Walker (1989) argues that every coherence theorist must be an idealist (not vice-versa), which is a conclusion to the fact that there is nothing to truth beyond what can be found in an appropriate system of beliefs. The idealism also appears in the metaphysics needed to make the coherence theory work.

2.4 Pragmatism

Not in opposition to above theories of truth but yet a different notion is the pragmatic theory of truth. The true beliefs will remain settled after a prolonged inquiry. (Pierce). Pierce for example does not reject a correspondence theory but merely complains that it is only a nominal or transcendental definition of truth, not cut for suitable practical matters of experience, belief and doubt.

Slogans:

Truth is the end of inquiry. (Pierce, Hartshorne et al., 1931-58)

Truth is satisfactory to believe. (James, 1907)

True beliefs are guaranteed not to conflict with subsequent experience.

There is also a connection to the coherence theory, as the result pragmatists expect is a coherent system of beliefs at the end of an inquiry. James (mentioned above) also maintains a verificationist approach: truth is what is verifiable.

As seen above, which theory of truth seems most viable seems to depend heavily on how one believes that physical and theoretical phenomena emerge. In general the distinction in emergence is a realism versus antirealism approach. The next section will go deeper into this distinction, which is later used in the authors' discussions.

3 (Anti)realism

Realism is the notion of a mind-independent existence, which could refer to various concepts. Antirealism is the opposed notion, so a mind-dependent existence. This opposition arises in various philosophical branches as noted by Michael Dummett, who therefore came up with the term antirealism (Michael Dummett, 1978) to characterize philosophical positions which oppose assumptions of realism. The two philosophical branches that will be considered here are the metaphysical one and the philosophy of mathematics. The approaches of antirealism and realism usually consist of numerous sub variants which will not be considered in depth here.

3.1 Metaphysics

Metaphysics concerns the nature of reality, which includes questions about ontology, consciousness, the interplay between mind and matter and a number of other philosophical aspects. Realism in regards to metaphysics would assume the mind-independent existence of a reality and antirealism assumes a mind-dependent reality. The antirealism approach to metaphysics is also called idealism, as mentioned numerous times before in this essay. We will refer to this type of realism as metaphysical realism (antirealism) as opposed to mathematical realism (antirealism).

3.2 Mathematics

Another branch is the philosophy of mathematics, which either assumes mathematical realism or antirealism. Where mathematical realism states that mathematical entities (e.g. natural numbers) exist independent of any minds and mathematical antirealism

states again the opposite. An important variant of mathematical realism is Platonism as argued by Plato, while mathematical antirealism finds its ways in intuitionism, logicism, formalism and predicativism.

4 Our perspectives

4.1 Implications of assuming different realisms

Both theories seem to hold a nature of truth which seems to fit the purpose: explaining the nature of truth. Whichever theory one takes as the right, more fitting or the more viable one, depends on some philosophical assumptions regarding the realisms discussed before. An interesting observation is that metaphysical and mathematical realism can be assumed mutually exclusively. This leads to four possible cases in terms of assumptions:

1. Mathematical realism and metaphysical antirealism
2. Mathematical antirealism and metaphysical realism
3. Mathematical realism and metaphysical realism
4. Mathematical antirealism and metaphysical antirealism

In the following paragraphs we will discuss what will be the consequences of taking each of these four positions. Especially regarding the interpretations of truth and the accessibility of the truths that arise from these interpretations. The first two stances have a more clear cut preference for respectively the coherence and correspondence theory of truth, while this is not so obvious for the latter two.

4.1.1 Mathematical realism and metaphysical antirealism

In this case mathematical entities exist mind-independent, but the metaphysical reality is mind-dependent. Since the correspondence theory relies heavily on a physical reality to correspond to, this set of assumptions makes the correspondence theory significantly unlikely to be viable. This is however based on a third assumption. The third assumption being that we consider objective truth, so truths which are not mind-dependent. Otherwise truth could correspond to the reality that is induced by each mind separately. This does mean that the mathematical entities induce the experience of reality, even though the nature of these abstract objects is not necessarily clear. What about the coherence theory of truth? Since it is assumed mathematical entities exist independent of the mind, those entities could be what induces truth. The properties and existence of these entities must be true independent of any language, but could potentially be described by some universal language. The universal language that describes these mathematical entities must be complete and consistent. Complete since all entities must be initiated and consistent since the entities must either exist or not exist. This assumption of a universal language induced by the existence of mathematical entities also implies that there is a

set of coherent propositions. It is this set of coherent propositions which would make the coherence theory of truth a viable theory to describe the nature of truth. This argumentation leads to a position named truth-value realism, indicating that truth-values exist independent of the mind, in this case induced by mathematical realism. Another important question is to what extent this objective truth is to be known by some minds. The accessibility to the universal language and therefore objective truth is questionable, but a mind-dependent language might be able to at least approximate or find some of the truths induced by the mathematical entities. Since the universal language is consistent, it cannot contain any paradoxes. This indicates that any language leading to paradoxes and therefore being inconsistent cannot be the universal language. It is not directly clear if the universal language could appear to be incomplete to us and also if this should somehow be problematic to our existence. Especially when considering what it is that constitutes the mind in this case, since the existence of the mind has to be related to these mathematical entities.

4.1.2 Mathematical antirealism and metaphysical realism

In this case a mind-independent metaphysical reality exists, but mathematical entities are mind-dependent. This set of assumptions seems to align better with the correspondence theory of truth than those in the previous subsection. Once a metaphysical reality exists, any fact or state of affairs existing in this reality can be stated as true, which is exactly the correspondence theory. The coherence theory in this case is much more unlikely due to the questionable existence of a consistent and complete mind-dependent language. The objective truth would be imposed by the metaphysical reality, so any attempt to access these truths would have to be in the universal language that describes this reality. This language however cannot lead to any mathematical entities, since this would mean that these entities are mind-independent which contradicts the assumption of mathematical antirealism. To find truth from the coherence theory in this case, one would have to find a mind-dependent language that describes the reality given by the metaphysical realism. The universal language imposed by the metaphysical reality will have to be consistent and complete again as was the case in the previous paragraph. Assuming objective truth emerges from coherence in a mind-dependent language seems highly unlikely, especially in comparison to the strong case for the correspondence theory in this situation. It is again questionable to what extent the truths arising from a metaphysical reality will be accessible by any mind in it. Especially since the mind is a part of the metaphysical reality it tries to describe. The undefinability theorem states that a language (at least as rich as arithmetics) cannot state its own truth values, so why would a mind be able to describe the truth values of its own foundations? Is this the same for the mathematical realism in the previous section?

4.1.3 Mathematical realism and metaphysical realism

In this case both metaphysical reality as well as mathematical entities exist mind-independently. From the previous two sections it seemed that mind-independent ex-

istence imposed objective truths, since mind-independence implies objectivity. In this case however there are two different forms of existence. What do they impose on each other? Either they exist without any correspondence to each other or the mathematical entities have to relate somehow to the metaphysical facts. In the latter case, one could ask if the mathematical entities are a result of the metaphysical facts or vice versa. If they exist separately, a natural question would be to ask where the mathematical entities come from. Yet the same could be asked about physical realities. The question of why certain things exist seems endless and not further necessary for the discussion on truth. Which of the interpretations of truth would fit these assumptions? It seems both could, but the difference between the two also blurs. There could be a coherent set of propositions induced by the mathematical entities as discussed in the previous paragraph, which gives validity to the coherence theory of truth. However, the existence of a metaphysical reality trivially allows for the correspondence theory of truth. If the entities are related to the facts, then what is the difference between the coherent truths that follow and the facts from the metaphysical reality? If they are not related, then it seems there are two different realities with their own truths. How about the accessibility to these truths? If the mathematical entities and the metaphysical objects are related, one has to find either of the two. However, our current arithmetic languages contain paradoxes, which indicates an inaccessibility to all truths. If the entities and objects are unrelated, then how are we to describe the metaphysical reality?

4.1.4 Mathematical antirealism and metaphysical antirealism

In this case both metaphysical reality as well as mathematical entities are mind-dependent. This means something else must exist besides these two views, otherwise what constitutes our experiences and minds? What would this existence be? Also, if everything is mind-dependent, then the truth must also be mind dependent and only subjective truth remains. This drastically changes the discussion to be very mind oriented. This case makes the coherence theory more viable over the correspondence theory. However, it would mean each mind would have to find its own language and coherence.

This section considered various assumptions on realism and the consequences they impose on the interpretations of truth. The next section extends the discussion on various related questions.

5 Questions better left unanswered, or maybe not?

5.1 Does incompleteness imply consistency and vice versa?

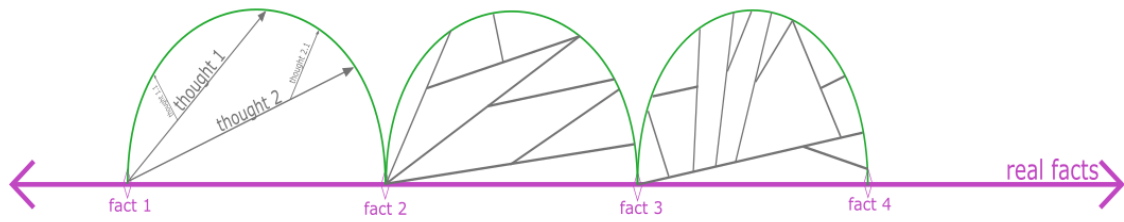
If so, aren't these two properties induced by one property, which corresponds to either answering a paradox with true and false or by just not answering at all. If a language can only be complete and inconsistent or incomplete and consistent this can be captured in a single property. A more important question would be if this correlation indeed holds or if the language is. The single property would be if a language contains undecidability or not. Meaning if a language has undecidability it will also have paradoxes. Is there objective truth or some underlying truth, independent of "systems of belief"? The fact that there are actual/real things in this world and that those exist (giving the sentence: "the banana on my table exists" the value true) leads to the observation that there is objective truth. Whether or not one believes in theories of the world is a (holographic) projection or a simulation or even only existing in our minds does not matter, as truth is something we assign objects in this world, whatever the world is. So the only question remaining is: is all truth relating in such a way to facts or actual/real things?

In case one thinks that there cannot be real facts if we assume that the world only exists in our minds: In this case the "real world" is what we commonly agree on to be real. If I see a chair in front of me, and you see the chair in front of me and most other people see the chair in front of me, that we all agree on that chair as being part of (all) our world(s). Thus the facts in this interpretation are simply the things we commonly agree on to exist.

5.2 Sentences as truth bearers and the bridge of thoughts

Saying truth is a predicate of a sentence makes only sense in interpretable languages. Yet those languages will allow for either inconsistencies or be incomplete, meaning there are truths that cannot be proven in that language. But does this correspond to any fact? In fact it seems to me that most of this truth is happening on a meta-level above the level of metaphysics of the real world and is unnecessarily a point of discussion. We establish true sentences upon true sentences to be able to predict and understand things and processes happening in the real world. We are building a bridge of thoughts to reach the next fact that corresponds to the real world and this bridge only holds this specific "truth" in this context. Whether the bridge is proven wrong at some point does not concern us, as we arrived at the next fact and the only thing we deduce to be an actual truth bearer are facts. As an example imagine Newton's law of gravity that is proven to be wrong, yet it has been used to establish facts.

bridge of thoughts



5.3 Objective truth and synthetic truth

My conclusion is that there is objective truth, yet it only applies to facts. The word truth is also used to assign sentences the predicate of truth, but that is a different meaning strictly speaking. I would even go that far to argue that there is objective truth that can be discovered and that there is synthetic truth that we are generating. And the sentence

"This sentence is false."

is one that cannot be assigned a true or false value in the synthetic sense, yet does not qualify as anything bearing truth in the objective sense.

5.4 Can all truth be found?

Assuming that there are infinitely many facts one can state about real word objects and things, one cannot assume that all truth can be ever said. Yet we can find mechanisms to describe all truth, but can all of those be found? By mechanism we refer to a some sort of formula or recursive procedure giving us more truths by applying them. Yet this has to be split from systems of belief. The sentence:

"copper is conducting electricity"

is a sentence that can be falsified and proven (falsified becomes important when we say "all copper is conducting electricity") and we can apply this same sentence with any other element other than copper. So this does not depend on a system of beliefs or any formal language. Yet it is hard to believe there is any way possible to find all truths without using fully interpreted languages of logic and those are known to be either inconsistent or incomplete. My conclusion is that if it is possible, it has to be a way that avoids fully interpreted languages.

5.5 Further implications

Furthermore objective truth does not depend on the theory of truth we decide upon, but it would imply that the truths found by either theory have to be the same. In the correspondence theory we would simply obtain truths by being able to perceive the rules that govern the relations between facts. On the other hand a coherence theory would imply that we are only able to perceive a small part of beliefs that lead us to truth, even if it means in very specific settings (system of beliefs).

Does some “content” exist if and only if it is provable/verifiable/falsifiable or does content exist independently and assertions of provable, verifiable and falsifiable are mere properties one can assign to any “truth-bearers”? If content exists if and only if it is provable, what is with objects/contents that are provable but there is no proof available or possible? Does it imply the existence of proofs?

5.6 Do paradoxes exist in reality?

From different perspectives paradoxes might exist in reality, or they might just arise in human made concepts that are indeed not reality itself.

The “hot take”: Reality is not paradoxical and cannot be, as long as causality is holding true. All paradoxes arise in meta levels above the level of reality and have no real impact on the real world. Self-reference is something that, thanks to causality, cannot occur with real world objects and hence only exists in this meta-level, which is clearly distinguishable from the real world.

The more anti-realistic view: Paradoxes will never arise in reality as reality itself is rendered without paradoxes. Paradoxes cannot render themselves in our reality due to the way we see it. We are bound to causality by our minds and will never be able to perceive the world differently. In what way we ever might look at some relations between objects, as soon as they are realised they render themselves free of any paradoxical properties. Hence things like the liar’s paradox or the reverse omega-sequence paradoxes fail to have a realisation that fits the paradox. Due to the structure of the world the way we perceive and describe it, the world is more limited than our mind and therefore the metalevel of language is a generalisation of the known world, extending it with things that cannot exist and yet can be formed on metalevels. Whether one refers to those levels as the new reality or not is part of a definition.

Since no formal language exists that is both consistent and complete, how does one accept any sort of coherent truth? Godel tells us no formal language (with some conditions) can be all consistent and complete from a finite set of axioms. Then if one chooses an inconsistent language, it seems the truth loses its meaning since it is defined by coherence/consistency (difference coherence and consistency?). If one chooses an incomplete language, what does this imply about the propositions with no truth-value?

6 Interpretations considering themselves

One strong condition on the two neo-classical interpretations of the truth should be that they cohere with their own definition of truth.

6.1 Corresponding to correspondence

For the correspondence theory to hold within the correspondence theory, there must be a part of reality where this correspondence theory exists. How can a theory exist in physical reality? The theory is per definition a concept that exists in the mind. This means that we should consider the part of reality that constitutes the mind. However

the language that is shaped in this physical mind and which states the interpretation of the truth is most likely not described by the universal language. Meaning that the only thing that exists is a mind with an inconsistent or incomplete language stating the correspondence theory. This language cannot be a proper description of reality, meaning that the correspondence theory does not exist in reality so cannot be true. What if the mind has access to the universal language? Or is it enough to be stated in an incomplete language? Can a proposition in an incomplete or inconsistent language describe physical reality? For an interesting perspective on these questions see the view of Ben-Ya'acov.

6.2 Cohering with coherence

For the coherence theory to hold within the coherence theory, this theory should cohere with any other proposition in the language. However, in the language the theory is stated paradoxes exist, so this theory cannot cohere with all known propositions. Could the coherence theory be stated by some universal language and would it in that case be contained in some objective truth?

7 Conclusion

The path to find the nature of truth is full of ambiguities and questions and is possibly endless in a paradoxical sense. Nevertheless, we have shared some basics of the literature concerning this topic and shared our own thoughts and views. Hopefully chasing the many questions with ambiguous answers leads to advancements in science and to a better understanding of our place in the universe.

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