

# Resolution to the Liar Paradox.

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## Abstract

We present a resolution to the liar paradox. The basic idea is that the liar sentence is ambiguous. Depending on the method of analysis of the liar sentence, it can express a true proposition, a false proposition or no proposition at all. There is no logical contradiction since we never get two truth values for the same proposition. We can avoid this problem of ambiguous sentences by always using the same rules of analysis for a sentence every time.

## 1 Preliminaries

### 1.1 Propositions vs. sentences

For this paper, we will define a sentence refers to a string characters. A proposition is an entity that is true or false. A sentence needs to be analyzed in a particular language, and when the analysis is complete one may obtain a proposition. For this paper, we will assume the language is English. Sentences possess no truth value. Propositions possess truth value. They are always true or false.

We define **analysis** in a specific manner. It is the process used to obtain a proposition from a sentence.

## 1.2 Defining truth for sentences. The source of confusion.

As explained in the preliminaries, sentences don't have truth value. However, for the sake of following historical convention, we will define a sentence as being **true** if it satisfies certain conditions. It is important to note that this property of truth we're defining for sentences is not the same as truth for propositions. The truth of propositions is of the pure philosophical kind. Truth for sentences is something of our own construction. Although we're making this explicit here, we believe that historically this was not made explicit, leading to a confusion.

We define a sentence as being **true** if it can be analyzed to produce a true proposition. Similarly we will define a sentence as being **false** if it can be analyzed to produce a false proposition. Similarly if a sentence can be analyzed to produce no proposition, it is called **meaningless**. There's an issue with this definition. As we will show, we can have multiple methods of analysis of the same sentence which lead to multiple propositions. So the same sentence can produce a true, false, or no proposition depending on the method of analysis. So by this definition of truth for sentences, a sentence can be true AND false AND meaningless. This is no paradox.

Authors have implicitly used this definition of truth for sentences while mistakenly assuming that all methods of analysis produce the same unique proposition, or they all produce no proposition. We'll demonstrate that this is false.

## 2 A simple example where ambiguity of the rules of analysis leads to problems

A: "Jack's car is blue."

For simplification we will assume Jack uniquely identifies a human being. Now what if Jack does not have a car? Assume he doesn't.

Does analysis of Sentence A lead to a proposition?

One person might say since "Jack's car" does not exist, we get no proposition and the sentence is meaningless.

Another person might say that the sentence should be interpreted as

B: "Jack has a car and it is blue."

Does analyzing B give us a proposition?

Someone might still object that "it" does not exist hence B is still meaningless.

Then someone might say A should be interpreted as

C: "Jack has a car and if Jack has a car it is blue."

Most people would agree that C can be analyzed to give a false proposition.

Another group of people might say that A should be interpreted as

D: "If Jack has a car, then it is blue".

Assuming material implication, this sentence when analyzed gives a true proposition.

So Sentence A, depending on what rules of analysis are followed gives no proposition, a false proposition or a true proposition.

Who is right? Which are the correct rules of analysis for A? There is no objective answer to this question. It is purely a matter of convention. If we wish to resolve ambiguity, we collectively (English language users), should stipulate that sentences like A with possessives need to be analyzed with a specific set of rules so that they give the same proposition every time, or no proposition every time.

As will be shown the situation with the liar sentence is exactly the same as the situation with A.

### **3 Applying varying methods of analysis to the liar sentence.**

Let's look at the strengthened liar sentence. [1]

Sentence A: Sentence A is not true.

We'll call our first method of analysis, the **first process**: I read the words of Sentence A in order. "Sentence A is not true." When I reach the word "true", I decide to look for a proposition expressed by "Sentence A" to find out if it's true or not. So I return to the sentence again, and read the words in order again... and repeat the process over and over.

So the first process of analysis never ends, and therefore no proposition is arrived at. If we are able to recognize that we are caught in a process never ends, we might declare that Sentence A is meaningless (meaningless sentence is not true). But this would be an incomplete declaration. To be complete, we must specify what method of analysis we used. So the complete declaration to make would be,

Sentence O1: "Sentence A when analyzed by the first process is meaningless."

This is a true sentence.

We'll now use the **second process**. The second process requires knowledge of Sentence O1. I read the words Sentence A in order. "Sentence A is not true." Again, when I reach the word "true", I decide to examine "Sentence A" again, but this time I use the knowledge that "Sentence A" is meaningless when analyzed by the first process. A meaningless sentence is not true. Therefore Sentence A when analyzed by the second process is saying the following:

"Sentence A when analyzed by the first process is not true." which I recognize as true after completing the second process because I have knowledge of Sentence O1.

So I correctly declare the following,

Sentence O2: "Sentence A when analyzed by the second process is true."

There is no contradiction between sentence O1 and O2, because I have specified the process of analysis involved.

Similarly I use a **third process** which refers to the sentence as analyzed in the second process. The third process requires knowledge of Sentence O2. When I analyze Sentence A according to the third process, I end up

interpreting it as:

"Sentence A when analyzed by the second process is not true." which I recognize as false because of my knowledge of O2.

So I correctly declare,

Sentence O3: "Sentence A when analyzed by the third process is false."

We've used 3 processes to analyze Sentence A. The first gives no proposition. The second gives a true proposition, and the third gives a false proposition. There is no contradiction.

Sentences O1, O2 and O3 are complete in the sense that they unambiguously each produce a unique proposition. If the sentences had not specified the processes involved we would have the same ambiguity issue, and there would be questions about what propositions they were expressing.

So which method of analysis is the valid one? They are all equally valid, and there are infinitely many of them. Note that sentences are just tools to convey meanings through some method of analysis. If one method of analysis gives one meaning, then that's what that sentence means according to that method of analysis.

## 4 How to resolve the liar ambiguity?

It's very simple. We've already identified the issue with our definitions for the truth of sentences in section 1.2. The definitions don't force a consistent set of rules for analysis. So suppose we define a sentence as **true** if when analyzed by a **specific set of rules**, it produces a true proposition. And we define a sentence as **false** if when analyzed by the same set of rules, it produces a false proposition. And we define a sentence as **meaningless** if when analyzed by the same set of rules, it produces no proposition. This resolves the ambiguity.

So a sentence gets analyzed only one way. It's the same solution as mentioned at the end of section 2. We won't specify a set of rules. But suppose we have a set of rules and we decide to analyze

Sentence A: Sentence A is not true.

We will always arrive at the same result every time. We will either say Sentence A is true every time, or false every time or meaningless every time.

Suppose we set up the rules so that Sentence A is meaningless. Therefore Sentence A is not true. Now we get the urge to assert "But that's what Sentence A is saying, therefore it is true." This urge is misguided. This urge is misguided. We cannot presume that that is what Sentence A is saying. We must remain consistent with the rules of analysis. We've stipulated the rules of analysis, so deviating from them is effectively using bad grammar. According to those rules Sentence A is meaningless, ie: it conveys no proposition. Any repeated analysis of Sentence A will be the same.

Now there is a true proposition about the lack of truth of A that we wish to assert in a sentence. We cannot assert it by restating the Sentence A. Is there some other way we can assert it? Yes. Just use a different sentence that conveys that proposition. For example

Sentence B: It is not the case that Sentence A is true.

Sentence B is a true sentence.

Now suppose our rules of analysis end up saying Sentence A is true. Then we can correctly assert

Sentence B: Sentence A is true.

## 5 Why has this solution eluded people?

I've illustrated why I believe the basic cause of the liar paradox, is the same as the cause of ambiguous sentences as illustrated in section 2. But the problem in section 2 is far less mysterious than the problem with the liar sentence. Why is this so? Firstly, there is a general equivocation between well-formed sentences and propositions. Coupled with this is the lack of "content" in the liar sentence. The liar sentence is not about a state of affairs in the world. But ambiguities are usually about states of affairs in the world. Those are the types of ambiguities we are used to recognizing.

The situation illustrated in section 2 relates to a state of affairs in the world. It's the kind of ambiguity that could happen in everyday life. The situation forces us to distinguish sentences and propositions. But the simplicity and lack of content in the liar sentence hides the need to distinguish sentences and propositions. There is a process of analysis going from sentences to propositions. This process is always there no matter how simple the sentence is.

## 6 Rules of analysis are not rules of logic

Specifying the rules of analysis by which sentences produce propositions are not rules of logic. They are rules of the language which in turn are rules of convention that come about by collective agreement. They are effectively rules of grammar. The liar paradox is therefore resolved by removing grammatical ambiguities in language.

## References

- [1] Wikipedia Contributors. Liar paradox, 2017. URL [https://en.wikipedia.org/w/index.php?title=Liar\\_paradox&oldid=786509317](https://en.wikipedia.org/w/index.php?title=Liar_paradox&oldid=786509317).