

Paradoxes!

Self reference leads to all kinds of trouble. Epimenides of Knossos gave an example more than 2500 years ago:

This sentence is false!

This can be neither true, nor false! It contains the seeds of its own destruction! The sentence asserts its own falshood, so if it is true, the sentence holds and so it must be false. On the other hand if the sentence is false, then it does not hold and so the sentence must be true. There's no way out: the sentence has no truth or falsity to it!

This kind of self-reference can be disguised: *The next sentence is true. The previous sentence is false.* Which if either of these sentences is true or false?

Here are several other paradoxes along these lines:

Bertrand Russell proposed the Barber Paradox: *In a town, there is a barber, who shaves exactly those men who do not shave themselves. But then who shaves the barber?*

Is he one of those men who don't shave themselves, the kind that he shaves? Or does he shave himself, and so is the kind of man he does not shave? Either way, you are stuck. Here's a tongue twisting variation on the theme:

Would a woodchuck chuck her own wood if she chucked wood for exactly those wood-chucks who would not chuck their own wood?

Self-reference can take other forms too. For example, most adjectives don't describe themselves at all: *big* is not a big word, and *crunchy* certainly isn't a crunchy word, whatever that could mean. But *small* is a small word, *common* is a common word, and you can think of other examples. What about the word *non-self-descriptive*?

Part of the problem is that language has a dual role here. On the one hand, it is just data, a sentence, a word. But on the other hand, it is active, asserting something, playing some role. The trouble arises when we use language to describe something about itself.

The logician W.V.O. Quine invented Quining: "is a sentence fragment" really is a sentence fragment. The sentence "*is a sentence fragment*" is a sentence fragment makes sense and is true. "*is not in English*" is not in English makes sense, but happens not to be true. But what about "Yields falsehood when preceded by its own quotation"? Is this true or false:

"Yields falsehood when preceded by its own quotation" yields falsehood when preceded by its own quotation.

There are many books that explore these themes in a fun way: Raymond Smullyan's *The Lady or The Tiger*, and Douglas Hofstadter's *Gödel-Escher-Bach* are masterpieces.

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