

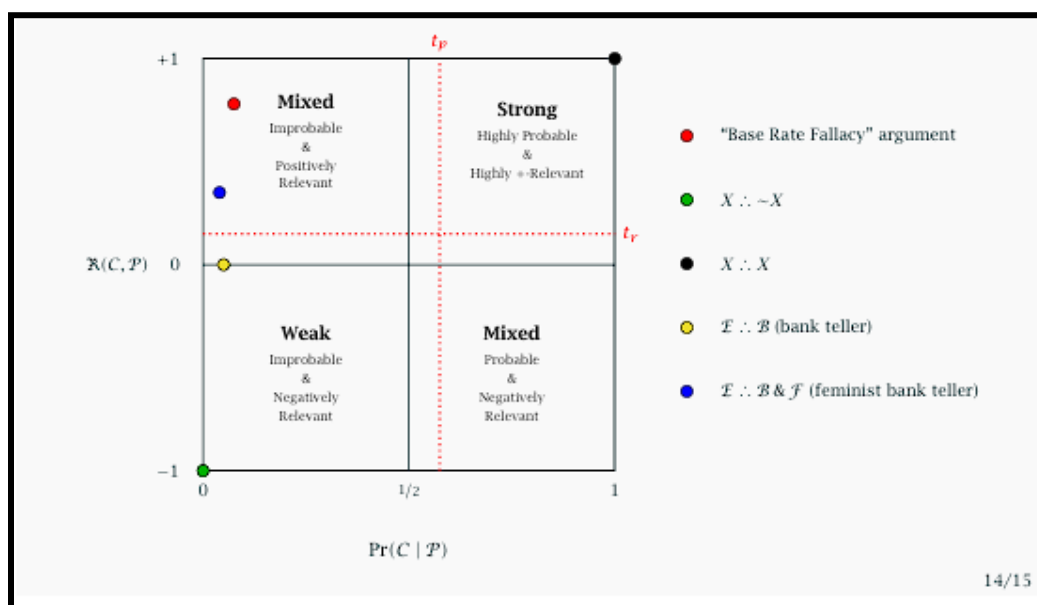
The purpose of logic for thousands of years was to divide statements into true or false. That assurance was helpful to people — something always was or was not. It was mathematical.

That was until 100 years ago, when members of the field accepted that life is too complex for that framework to always be true, and probability was introduced. Now, Branden Fitelson, a professor of formal epistemology at Northeastern University, wants to normalize another measure: relevance.

“If you ask whether an argument is strong or not, it'd be really weird to say that you have a strong argument, even though it's irrelevant. That just doesn't make sense,” Fitelson said.

Despite this, relevance has not been part of any official theory of argument strength. His 2025 presentation, *a Two-Dimensional Theory of Argument Strength with Applications*, addresses that. One dimension is probability. The other is relevance (defined here as the ratio of the true positive rate to the false positive rate).

Fitelson visualizes these dimensions on an x-y graph, with argument examples plotted across it.



*The Two-Dimensional graph, with plotted arguments.*

“The more interesting arguments are the mixed ones,” Fitelson said. He went on to describe a man named Fred Fox. This Fred Fox is a biological male and has also been taking birth control pills for several months.

It would be safe to say that the probability of Mr. Fox being pregnant is low, even zero. But where does this knowledge come from? Intuitively, Fred's chances of being pregnant don't have much to do with the birth control, and are instead from him being male. Therefore, the pills are

not relevant evidence to the very probable conclusion that Fred Fox is not pregnant. This example would be plotted in the bottom right of the graph.

Perhaps what is most interesting about Mr. Fox is the intuition that relevance is part of how we think, even when it's not so important. When relevance is not only left out, but rejected, it changes more than just academic theories. Our self-esteem in how accurately humans see the world becomes bleaker.

In 2002, Daniel Kahneman won the [Nobel Prize](#) in economics for his work with Amos Tversky on [human reasoning](#). They asked people to consider the following statement: "Linda is 31, single, outspoken and very bright. She majored in philosophy. As a student, she was deeply concerned with issues of discrimination and social justice, and she also participated in antinuclear demonstrations."

Given this profile, they asked people if it's more probable that Linda is a feminist and a bank teller, or just a bank teller. Statistically, it's more probable that Linda is only a bank teller. This is because both scenarios say she has the job, and adding more detail, like her personality, only creates more possibility for falsehood.

However, most people said it was more probable that Linda was a feminist bank teller. Using this data, Kahneman and Tversky concluded that people are bad at probabilistic reasoning, and won their Nobel Prize. Fitelson disagrees, thinking it's this conclusion, not the people, that are missing the greater picture.

"Why would they be saying that there's something better about the feminist bank teller argument?" Fitelson asked, rhetorically. "It's actually quite a simple answer. People are tracking exactly the objective thing that they're supposed to track, which is relevance."

Having two dimensions makes arguments more complicated. But there's also a comfort in logic's theories imitating our messy, nuanced lives. "Life's tough. Arguments are no different," Fitelson quipped.

Sometimes the best answer one can get is a grey one, even mathematically. As epistemology keeps filling in the unknowns between true and false, Fitelson imagines even more dimensions. "It wouldn't surprise me if there were still other considerations that were relevant to argument strength, besides probability and relevance, that wouldn't at all surprise me."

He named conversational relevance as a possible dimension and, in humility, saw his theory as just another step toward a more sensible, nuanced, and complete world.