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How we can (or can't) experience the Schrödinger's cat principle in everyday life

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In the world's most famous thought experiment, physicist Erwin Schrödinger described the uncertain predicament of a cat in a box.

The peculiar rules of quantum mechanics meant that it could be both dead and alive at once, until the box was opened and the cat's state was measured. But for your average not-quantum physicist, the idea of a parallel universe is a trippy problem to wrap your head around. So I didn't really try.

Until one day when I thought I was having an especially useful epiphany lying on an examination bed in a doctor's room, waiting for the results of a routine scan. I went through my usual sequence of praying, bargaining and promising to be a far better person if all would be well. But a more unusual element was the flash of insight which followed.

In an exhilarating moment of clarity I thought that I understood Schrödinger's cat. In those minutes, while waiting for the specialist's verdict, I was the cat in the box – both alive and dead.

After my clean bill of health, I did some light googling to confirm my eureka moment and discovered that, in fact, I didn't understand at all.

It turned out that not only was my grasp of the concept behind Schrödinger's cat incorrect, but my understanding – or lack of it – represented an exceedingly common misinterpretation: believing that one can change the state of a particle by simply observing it.

Schrödinger's cat has made its way into pop culture with regular appearances in television, movies, comics and science fiction. Just as I did at my doctor's visit, many people reference it when talking about a situation with an unknown outcome. As one example of many, in the popular sitcom The Big Bang Theory, Sheldon advises Penny that, just like Schrödinger's cat being alive and dead at the same time, her date with Leonard had both good and bad potential outcomes.
The cat also made occasional appearances on the animated sci-fi show Rick and Morty, and more recently, the German science fiction thriller Dark makes extensive use of Schrödinger's cat to describe the existence of parallel realities within the show's universe.

Greg Egan's 1992 science fiction novel Quarantine goes as far as exploring the consequences of the Copenhagen interpretation of quantum mechanics. While acknowledging that it was chosen more for its entertainment value than for its likelihood of accurate interpretation, Egan capitalises on Schrödinger's hypothetical cat as "one of the most familiar illustrations of quantum-mechanical oddities."

In the novel, a physicist asks the narrator, an ex-cop and private investigator, if he has ever heard of "the quantum measurement problem". The narrator is clearly confused, but when asked if he's heard of Schrödinger's cat, he replies, "Of course."

Relieved to discover that I wasn't alone in my ignorance, I realised that I needed to go back to basics. So, I started by looking at how the Schrödinger's cat thought experiment is explained to children.

First, I needed to look more closely at the box.
In the box is a bottle of poison and some radioactive material. If the radioactive material decays and emits radiation, the

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radiation is detected by a Geiger counter that triggers a hammer to break the bottle, releasing the poison and killing the cat. However, because the occurrence of radioactive decay is unpredictable, it's impossible to determine if the cat is alive or dead without looking in the box.

Next, I learned that Schrödinger was using this thought experiment to refute ideas about quantum physics and how it should be studied. In particular, Schrödinger rejected the application of the Copenhagen interpretation of quantum superposition to macroscopic systems, asserting that it only made sense in subatomic applications. It was like an inside joke between physicists that we couldn't possibly¬¬ be expected to catch.

And I still didn't get it. So as Hip-Hop prescribes, I tried to break it down.

At the level of subatomic particles in the quantum world, things don't behave the way we are used to in everyday life at all. In fact, they exist in a kind of limbo until they are observed.

This in-between state is known as superposition. Superposition implies that subatomic events are never decided on until they are observed. But although this works for subatomic particles, it can't work for bigger particles. In other words, although it can work with a radioactive atom – which can be in an indeterminate state in which it has both decayed and not decayed – it simply can't work for something as big as a cat.

"Anyone who is not shocked by quantum theory has not fully understood it," said Niels Bohr, the Nobel physics recipient who was regarded as the founding father of the Copenhagen interpretation.

Considering he was talking to his peers, perhaps we shouldn't beat ourselves up about the fact that most of us get it wrong and understand so little.

My guess is that the reason we think we get it when we don't is not only because we can't wrap our heads around it all, but also because it's probably easier to go with the inaccurate (but far more accessible) interpretation of the central role of the observer: "When I pay attention to something, I can change the outcome."

So, what did I learn since that initial Google search? Well, I now know that at the very heart of the Schrödinger's Cat thought experiment is the understanding that the laws of quantum mechanics can't be applied to everyday life at all. It's precisely because the quantum world operates with its own rules that it's so difficult to make sense of it using the language and concepts that are familiar to us.

I learned, too, that while popular culture can be useful for making difficult concepts more accessible, when we repeat incomplete insights to each other, we risk distorting the truth – like in the game "broken telephone" that children played before the days of the internet.

Most importantly, though, I learned that even though living life as an active participant and daring greatly might very well be the best way to live, it has absolutely nothing to do with Schrödinger's cat.