

BE101x: Behavioural Economics in Action
Unit 1.3.1 Rational Choice

DILIP SOMAN: What does it mean to be rational? Perhaps the best way of answering that question is to go through a simple example. Suppose a friend of yours comes to you and says, Dilip, how much should I save for a diamond? How would you advise that person to proceed?

Well, it turns out that economics has a very handy model to describe how this person should go about making that decision. That model is called the life cycle hypothesis. And without getting into too much detail, what the hypothesis essentially says is, you want to look at the net present value of your future income stream. You want to look at the net present value of your future consumption stream. And then set your savings decision such that the present value of those two numbers is the same.

Sounds simple. It's something you can write in an equation. It takes all of a one inch by two inches in a textbook to express. But let's think about what a human being really has to do to make the equation work.

Thing number one. I need to understand my exact consumption streams until the time I die. I need to know how many children I'm going to have. What sort of lifestyle we're going to live. Whether we're going to enjoy the movies, we're going to enjoy living in an apartment, a condo building, a house.

Thing number two. I need to know exactly what my income streams are going to look like.

Thing number three. I'm going to need to think about what the economy is going to look like. What my interest rates are going to be. What my investments are going to do. And I could go on and on, listing the kinds of information you would need to know to answer that question. I don't know anyone who can actually do any of this.

And that, essentially, is the difference between an irrational human being, and what is an economically rational person. So what does it mean to be rational? Well, there's a lot of things that go into the definition of rationality, but I'm going to be very simple in this video, and I'm going to focus on what I call the four C's of rationality.

And here they are. Completeness of information, cognition, the ability to think through problems, computational ability, which is the ability to process information and make fairly complex calculations, and finally, consistency in decision making, both internal and external.

Let's go through each one of them in detail. Start off with completeness of information. I think it's pretty fair to say that not a single person who is listening to this will agree with the economists that it is possible to completely know all of the information about your future state of the world. It just isn't going to happen. There might be some decisions where you have completeness, but in most decisions, you don't. Even when you go to a store to buy a product, there are always issues like safety, and warranty, and after sale service that you don't have information about.

The second point that we talked about was cognition, the ability of human beings to make completely unemotional decisions. And that's important from a rational perspective. If you're a rational agent, what you want to do is to look at only elements of the decision-making that adds something called utility to your choice, and look at those, and only those. But it turns out human beings look at all kinds of other things.

Regret is one of my favorite examples. What is regret? Regret is the emotion of wishing that you had chosen something that you did not choose. Regret happens in all sorts of situations. So you look at a movie listing.

You're thinking about which movie to watch. You end up picking a movie that seems great on everything that's been written there, but you go and watch it, and you hate it. And you say, gee, I wish I had seen the other movie. That's regret, all right?

And regret can actually affect decision-making in a number of different ways. Simple example. I had a friend, curiously, an economist, who was looking at a membership to a health club. His building had a health club. They were offering a 30% discount, and like any good economist, he thought, and thought, and thought about that membership. And he thought for so long, that the club withdrew the 30% discount, and replaced it with a 15% discount.

And my friend said that he did not want to sign up for the health club at 15%, because he could have had the same membership for 30%. That's an example of a regret from a previous decision influencing your future decision. And it's not just my friend. The number of people that should have bought a stock that's going up for \$10 but don't, because they could have bought it for \$7 is stunningly high. So again, we see examples of these emotional responses to decision-making in a number of different spectrums.

The third C of rationality is something called computational ability. If you can go back to our decision-making on how much to save for the future, there's a lot of computations that are involved. There's obviously addition, there is multiplication, there is summation, there is discounting. So even if you had perfect information on all the numbers, the sheer act of computing the outcome is problematic, it's difficult.

And think of it as follows. You're essentially trying to solve a complex problem, it's an optimization problem, that, in the world of computing for example, can best be handled by a Sun supercomputer, but now you're giving it to your laptop to process. What happens there is the laptop, at some point in time, simply freezes, cannot handle the data, and gives up. So what human beings tend to do is, they tend to try and find short cuts so that they can actually make decisions, given their limited cognitive abilities.

Herbert Simon was a Nobel Laureate in Economics, and he first came up with a term called bounded rationality. And what he was saying when he meant that was, he said, people are rational. They could have been rational if, in fact, their heads were replaced by a supercomputer, but now that they only have that little laptop, they had to be boundedly rational. So in the context of the limited cognitive ability that they have, they're still rational, but it's just that they can't go beyond a certain limit.

So we've often heard terms like that. We've heard the idea that attention is constrained, because if you think about perfect rationality, you need to be able to soak up lots of information. But it turns out there is competition for our attention. We're looking at the products that they're looking to buy. We've got our BlackBerrys, our watch, we've got our kids yelling at us. And when you think about a world as complex as that, we can only devote so much attention to the stimulus, and that's why we never pick up all of the information that's necessary to make a good decision.

Finally, the big idea of rationality is contained in the fourth C of the four C's that I talked about. And that is a C called consistency, both internal and external. Now, when you think about the mathematical modeling of rationality, there's a fairly complex set of algorithms and theorems that actually describe what rational choice looks like.

And in order to understand those, we want to first look at this, which is a simple mathematical expression of the utility that a product offers to an individual. If you look at equation, U stands for utility. And what it says is that the utility is the sum of w multiplied by the x . What is x ? It is the attribute or the outcome that could potentially happen as a result of you making that choice. And the w stands for the weightage that you assign to that outcome.

Simple example. Let's say you toss a coin. It comes heads or tails. If it comes heads, then I give you \$100. If it comes tails, you give me \$50. The way I'm going to capture that using this equation is, I'm going to say that the weight is here, the probability of each of these outcomes, 0.5, multiplied by the utility of the value that I assign to the \$100, or the minus \$50.

Think about applying the same equation in a different setting, where you're choosing a product from a multiple set. In this case, the x 's are going to stand for the different attributes of the product, the quality, the price, the size, the shipping costs, and the w 's are going to stand for how important each of these attributes are to you, the decision maker.

So again, this is a fairly general model. It captures all kinds of choice situations, but what is center to all of these is the idea that, somehow, these different outcomes, these different attributes, combined with an importance weighting, conspire to form something called utility, which is the measure of how valuable that product is to you, the consumer.