[SQUEAKING]

[RUSTLING]

[CLICKING]

RICHARD DE NEUFVILLE: So the consequences, then, of these axioms is that if you accept these axioms, you can construct a valuation function that is meaningful. Now, it is only meaningful in terms of ranking. That is, I can say given a set of alternatives, I can talk about the first, second, and third in terms of which is my ranking for them. But I can't say with any meaningfulness that one is twice as valuable as the second, or the second is one and a half times a third, and so forth. Cardinal distances don't particularly count.

In the same way, any function of this sort, there are many that there are monotonic. A monotonic transformation is an equivalent value function. For example, if I take this function of these two variables, and I say I have X squared, X1 squared times X2, and I take logarithms of it, this second one here will have rank combinations of X1 and X2, these two qualities, in the same order as this other one.

But the numbers can't be interpreted as being meaningful, in terms of one being twice as good as the other because of the monotonic transformation. So it's good for ranking. As you can appreciate, that limits the kind of usage you can make of a valuation function.

So I think you're ready, Indra, for another pause and poll. So if you are, please launch it. Well, it seems like there's a clear special interest in the monotonicity one, which is OK.

So let's stop the poll now. I got the message. And I'm open to discussion of it. So somebody would like to pose a question about something that they would like clarification on, or more the discussion on, or what have you, please go ahead.

INDRA: Do you have a specific question, or would you just like the professor to go over the principle again? Yeah, so Stuart has a question. What is a monotonic transform?

RICHARD DE NEUFVILLE: A monotonic transform is something like taking a log, or multiplying everything by 3, or dividing, or taking a square root-- something that does not change the ordering that's associated with it. And there's a large class of them. Let me put it that way.

So the point to be taken is that if you have a valuation that is X1 squared times X2, you have numbers coming out, but those numbers don't particularly mean anything. If you subject it to any one of these transformations like a square root, or logarithm, or whatever that will transform that original function, you have something that is equally going to give you the correct ranking. And so there's just lots of different possibilities.

So to say that one measure of X1, X2, X1 squared X2 is 50 and the other one is 30, the comparison of two things doesn't say that one is 67% better than the other, or that 20 difference makes any sense. It's that number can be manipulated. That's the point of that, is there's no one way of doing it. That is the point.