

Think Twice To Think Better

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To "think twice" is to reconsider that first conclusion that we all arrive at so easily. Here's a look at how and why.
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The expression "think twice" is simply a reminder to fully consider things before assuming that your first conclusion is the correct one. It reminds me of the carpenter's rule: "measure twice, cut once." Measuring twice is a rule that prevents a lot of mistakes in carpentry. In intellectual pursuits, thinking twice does the the same thing - it prevents errors.

{bot_wrgoogle}Of course, getting familiar with some of the common thinking errors also helps you avoid them. Here is a look at one to watch out for.

Think Twice About Straight-Line Projections

Upon his first visit to the ocean, a scientist noticed that the level of the water in the sea was rising. In fact, after carefully measuring it for a few hours, he noted that it was rising at the rate of more than a foot per hour. He took out his pen and paper, and quickly calculated that at this rate the ocean would be 700 feet higher in less than a month, drowning most of the major cities of the world. Within a year only the highest mountain tops would be above the water.

Fortunately, when he ran off to sound the alarm and show his calculations to others, they corrected his error. The ocean came up every day the people explained, and then went down again. He somehow hadn't learned about tides, but soon saw that the people were right.

Now, you might think that this is nothing more than a silly story, with no relevance to real science and scientists, or your own errors, but think twice! Examples of this thinking error are all around. A cooling trend in the 70s had some scientists proclaiming that Florida would be too cold to grow oranges by 1985. Some of today's more extreme projections of global warming may be based on the same error (but they could be wrong in either direction).

I remember other examples from my own childhood. Sitting in the classroom in 1975, for example, my very serious science teacher showed us a very serious film which proved oil supplies would be depleted by 1990. The mathematics was undoubtedly correct. There was just so much oil in the earth, and our use of it was growing at a rate that showed we would clearly run out soon.

Of course, we didn't run out in 1990, nor in the seventeen years since then. These kinds of projections often seem to ignore everything other than those lines on a chart. Or to the extent that other factors are considered, they are used to confirm those projections. Good math may be used, and the people using it may be very intelligent, but the error is in assuming we can reduce complex interactions to simple formulas that can then be used to predict the future.

As the price of oil rises, there is incentive for producers to find more. This was apparently ignored in the predictions of the scientists. If they had thought twice, it was easy to imagine that we hadn't yet found all the oil in the planet.

High prices would also motivate people to use less at some point. It again takes only a bit of thought to imagine that people would use less gas when the price went from 50 cents-per-gallon to \$4 or \$15 per gallon. Demand might not be as great. This was also apparently ignored.

Of course, those high prices would cause people to buy cars that used less gasoline, as well as to look at alternative energy sources. Isn't it reasonable to assume that many alternatives start to look attractive when oil prices are ten times as high? This too was ignored. In fact, in hindsight, the assumption in that "scientific" film that we would just keep using oil in the same way until one week it was gone - well, it seems almost silly now.

Many systems, whether economic, biological, psychological, political, or ecological, are self-correcting. That is, they have trends that look like they will continue to head in one direction, but there are other factors that will prevent this from going

too far. Things won't always return to some norm, or in a statistician's terms, "revert to the mean." But at the very least, the interactions of the various factors are complex enough that predicting the future based on a chart or trend isn't too likely to succeed.

It would be nice if predicting the future was as simple as collecting data, charting it and assuming that any trends will continue in the same direction. Unfortunately (or perhaps fortunately), real life is more complicated than straight-line projections can account for. So before you assume you can see where the data is leading, look at all the other things that might affect that trend line. In other words, think twice.

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