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The Visualization Trap

by Neal J. Roese and Kathleen D. Vohs

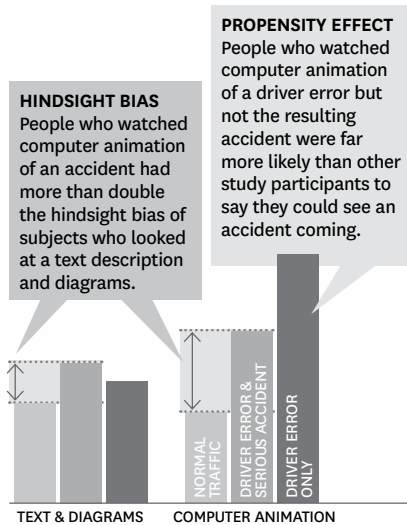
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The Visualization Trap

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“I COULD SEE IT COMING...”



Hindsight bias—the irrational belief that past outcomes were predictable—is a well-understood psychological phenomenon. Our research suggests that this bias is becoming stronger, thanks largely to an abundance of visual information, including re-creations and simulations. But in measuring it, we’ve also discovered its near opposite, what we call the *propensity effect*: Visualization may also, in certain circumstances, make people hyperconfident of impending events’ outcomes.

We presented study participants with traffic situations. Some received a text description with diagrams, and others watched a computer animation. The amounts and types of information varied within each group. Some people examined normal traffic conditions; others saw or read about a driver error but not the resulting accident; still others saw or read about the driver error and the resulting accident.

Hindsight bias more than doubled for the subjects who watched the computer animation. The propensity effect was significantly greater for those who watched the driver error but not the accident: They were more likely to say they could see a serious accident coming than those who actually saw it occur and *then* were asked if they had seen it coming.

You experience the propensity effect when, say, a baseball that’s hit hard gives you that momentary feeling of “just knowing” it’s going out of the park. People misattribute visual processing of motion to higher-order judgments, such as predicting outcomes. So far, we’ve tested propensity only in relation to trajectory events (cars heading toward an accident), but movement seems to be a key factor in sparking the effect. When we gave subjects still photos of the same traffic situations that they could page through at their own pace—in effect making flip-book animations—the propensity effect wasn’t present.

Computer-animated visualization is appealing because it can help make sense of highly

complex information, but it’s also, quite literally, a point of view. The information can be conveyed with certain emphases, shown from certain angles, slowed down, or enlarged. (In a sense, all this is true of text as well, but with subtler effects.) Animations can whitewash the guesswork and assumptions that go into interpreting reconstructions. By creating a picture of one possibility, they make others seem less likely, even if they’re not.

When an objective reading of evidence is critical—as it is in a courtroom and in many business contexts—both the deepening hindsight bias and the propensity effect can be pernicious. A manager with the tools to animate financial data sets, such as sales forecasts, can easily—on the basis of the story the visualization tells—misidentify trends, place blame where it doesn’t belong, or become overconfident about an action plan. Or a sophisticated visualization of customer feedback data might make it appear, for example, that a new smartphone had tanked because it lacked user-friendliness, though pricing and app availability were also responsible. A false sense of certainty about what went right or wrong can make managers unwilling to consider strategic alterations or search for new ways to attack problems.

We don’t suggest doing away with animations. In many cases, they really help penetrate complexity. But we need further research to understand the consequences of using them to depict data and to know how to control for variables.

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