Of Narratives & Numbers

BY NICOLE GRABEL AND SHAYNE KAVANAGH

Do numbers tell the story or do we? Recognizing the way our own narratives influence the way we see numbers can lead to better decision making.

It is probably safe to assume that finance officers are more comfortable with numbers than most of the decision-makers the finance officer supports. These decision-makers are likely more comfortable with narratives. Numbers are often part of the conversation, but psychological research shows that people often grossly misunderstand and/or misuse numbers in favor of their preferred narrative. Of course, finance officers are people too, and they can fall prey to the same pitfalls as less numerate people. A better understanding of the relationship between narratives and numbers can help us structure decisions more wisely.

In this article, we will explore narratives and numbers in four parts:

What we see is all there is. We tend to overemphasize the information that is most tangible or available. Numbers are often abstract by comparison.

We string that into a causal story. People are good at finding patterns. Often, this is a big advantage, but it can also lead us to find patterns where there are none.

We continually confirm that story. We want to be right. We tend to overweight information that supports our preferred conclusions and discount information that doesn't.

We translate our inferences imperfectly. We are not good at evaluating the accuracy of our stories.

WHAT WE SEE IS ALL THERE IS

Numbers are an abstraction of reality. Therefore, people tend to gravitate toward vivid information like examples or anecdotes. In particular, people tend to emphasize information that is easy to recall. They may recall recent experiences and overlook relevant but older information. For example, the views of the citizen who spoke at the most recent public hearing may be weighed more heavily than views expressed at older meetings. People also recall vivid or extreme examples more easily. So, for instance, a recent natural disaster might get more attention in planning mitigations than another type of disaster that has historically been more commonplace.

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People's attraction to narratives and examples means that we can be swayed by anecdotal evidence and overlook broader, more informative statistics. We've all encountered the argument: "Well, I know a person who…[insert personal experience that seemingly disproves a broader statistic]." This can happen in public administration too. For example, when evaluating the effectiveness of a program, people might focus on specific program clients that the program has helped or failed to help rather than looking at a larger sample of program participants.

WE STRING WHAT WE SEE INTO A CAUSAL STORY

Human beings are great at finding patterns in information, but the downside of this ability is that we are prone to find patterns in places where meaningful patterns don't exist. These false patterns become the basis for a causal explanation of what we observed. The most basic manifestation of this tendency is termed "post hoc ergo propter hoc," which means because one event preceded another, the preceding event was the cause. For example, if the police budget goes up (or down) and the crime rate then goes down (or up), people might conclude that the change in the police budget was the cause. Perhaps the budget change had something to do with it, but there are many possible causes of crime, so it is also possible that the budget change had nothing to do with it.
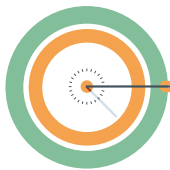
WE CONTINUALLY CONFIRM THAT STORY

Once we have a story, we want it to be true. This biases how we take in information. The aptly named "confirmation bias" is a phenomenon in which we take note of evidence that confirms our story and (subconsciously) ignore evidence that disconfirms it. For example, imagine a school implementing a new program to improve reading.

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Supporters of the program may tend to focus on students the program helps and ignore or discount those the program doesn't help.

Biases may also affect our perception of the past to better support our current beliefs. "Hindsight bias" means we tend to see past events as more predictable than they were ("I knew this would happen" or "you should have seen this coming"). This might cause decision-makers to underestimate the uncertainty inherent in many public finance decisions. "Choice supportive bias" is where we tend to recall mostly the positive attributes of a choice we have already made (and even ascribe new, fabricated, positive attributes to the choice) and forget the drawbacks. This would make critical examination on previous budget decisions, for example, more difficult.

WE TRANSLATE OUR INFERENCES IMPERFECTLY

Of course, our stories must meet reality at some point. However, our biased brains often prevent a clear-eyed assessment. One of the most prominent biases in this vein is the "overconfidence bias." The overconfidence bias can manifest in various ways:

Thinking we are better than we are relative to other people. For example, in a survey of 76 GFOA members, 81 percent thought they were in the top 50 percent of finance officers for their decision-making ability.

Thinking we can predict the future more precisely than we really can. To illustrate, research has shown that when people are asked to put a range around some future value (like next year's revenue), they are likely to give a narrower range than what they should be confident in.

We are too optimistic about how new ventures will turn out. For instance, people routinely underestimate budgets and schedules for new projects.

Another pitfall in making clear-eyed assessments is our ability to correctly interpret uncertainty. A common application of this is if someone tells us something will "possibly" or "probably" happen. When people are asked to put a percentage chance on what they mean by "possibly" or "probably," the numbers they give can vary greatly. In fact, some people mean much less than a 50 percent chance, while others mean a chance much greater than 50 percent. This could lead to serious errors in communication.

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Case study on narratives (and numbers)

Let's examine a case study that illustrates many of the pitfalls we just reviewed. We'll also see one way to overcome these pitfalls.

A superintendent was presented with an idea by the school district's English Department for a program to help middle-school students who were struggling with writing in their English classes. The program would feature small-group learning, with two students per teacher, to provide focused help for students who were a year or two behind their peers in their writing skills but who seemed well-suited to catch up. The superintendent loved the idea. Not only did it fill a need to improve students' writing skills, but it also aligned well with his theory on how the school district could best help children, which was for highly skilled teachers to provide intensive, targeted support for struggling students. Therefore, the superintendent and the district made a substantial commitment to this idea: The program was given a dedicated room, complete with new computers, new carpeting, and a new paint job—at a cost of $40,000. Further, four full-time equivalent teacher positions were dedicated to run the program. Besides the financial commitment, the superintendent showed his personal commitment. On his regular visits to the school buildings, he would stop by to see how the program was going—and he liked what he saw. Students were engaged in orderly and concentrated study with teachers by their sides.

At the same time, a smaller investment was made in a math program to help struggling students. This program was a hybrid of multiple teaching and learning styles. At any one time, one-third of the class would participate in group lecture with the teacher, a third would work independently, and a third would work on computer-aided lessons. However, this program was only offered as a concession to the Math Department, which had loudly voiced its displeasure with the disproportional resources going to English. The superintendent was not personally invested in this program. When he did go to observe it, what he saw justified his ambivalence: The class was chaotic, noisy, and did not present a productive learning environment. Further, the teacher of the program appeared stressed.

When it was time to build next year's budget, the superintendent was expecting to cut the math program. However, examining data on program effectiveness was a principle of the district's budget process, so it was important to honor this principle and examine the data for these programs. Regardless, the superintendent reasoned that the math program would be cut because the data would show the program's presumably poor results, which would help build support among the rest of the district's management for cutting the program. Then he got a surprise: The scores of the students in the math program exceeded expectations. On average, students made 18 months' progress in a year. Meanwhile, there was no detectable improvement in the abilities of the participants in the English writing program, considering both grades and the quality of writing samples.

It turned out the noise that the superintendent observed in the math program was the natural byproduct of middle schoolers getting excited about something (in this case, math), and the chaos was partially a result of students sneaking into the class because they had heard that this was the place where they'd finally conquer math. Conversely, the apparent order in the English class was because, as attendance data showed, about half the students were cutting the class (so they weren't there to cause disorder), and the concentrated work between students and teachers turned out to be not much more than a glorified study hall, where students would get tutoring on their regular classwork rather than systematic instruction on how to improve their writing abilities. Perhaps less surprisingly, the English program cost more—almost four times as much!

The decision was clear. The English program was canceled, and a new English program was modeled on the successful math program.
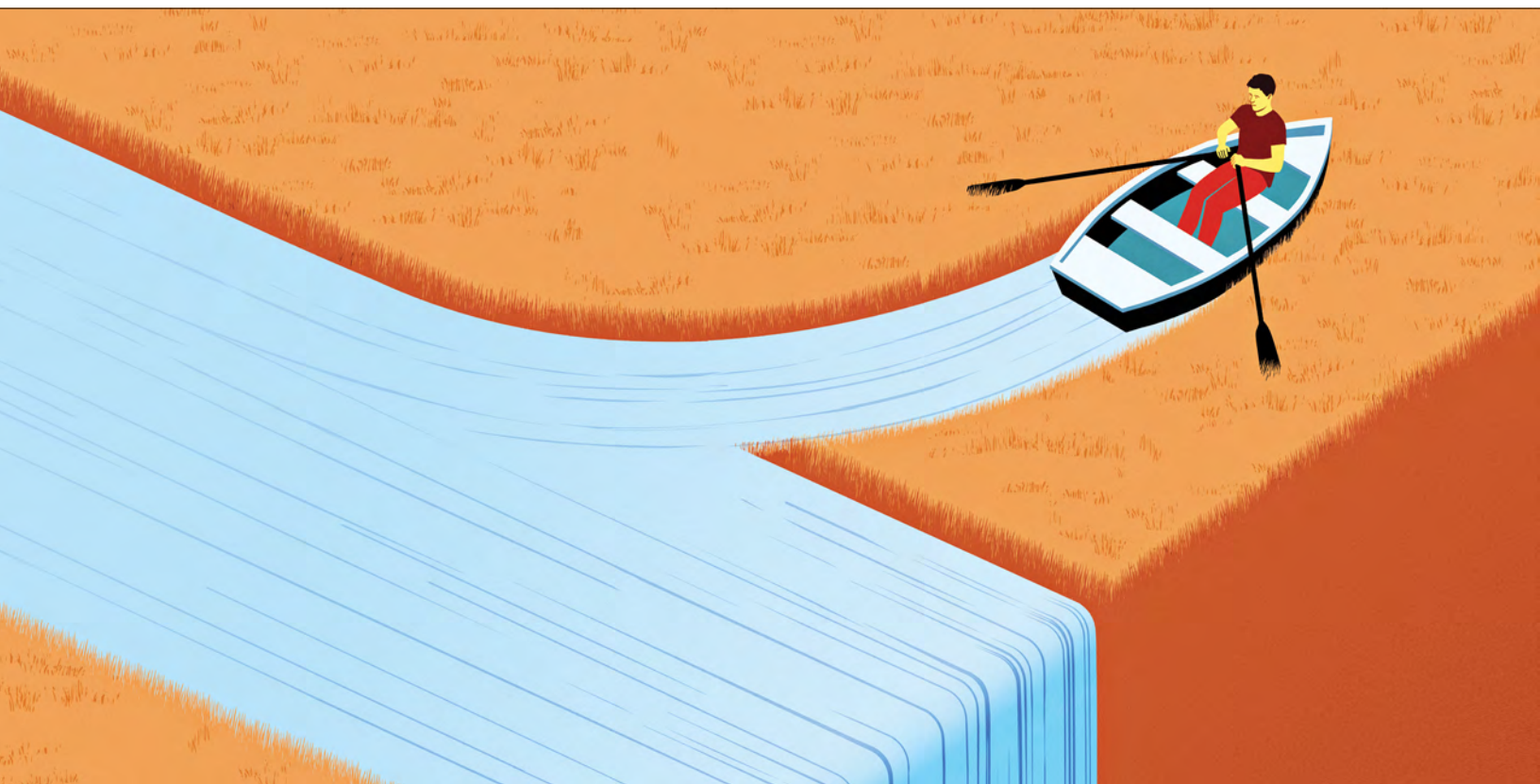
HOW TO AVOID THE PITFALLS OF NARRATIVES AND NUMBERS

In the case study, we saw one way to counteract the pitfalls of narratives, but what else can be done? One way we can't avoid the pitfalls is by just being smart. In fact, research has shown that more intelligent people (as measured by intelligence tests) are more susceptible to the types of biases we described. This might be because intelligent people are good at coming up with believable stories and arguments as to why that story is true. So, if we can't outsmart biases, what are our options?

Independent and structured judgment

You can break a decision down into separate criteria. For example, if you were evaluating potential new programs to achieve some policy goal (like reducing homelessness), you could have criteria for how effective the program would be and how much it would cost. It might be possible to further disaggregate these categories. The cost of the program might disaggregate into initial start-up costs and ongoing costs. The goal is to make the evaluation process focused and deliberate. This could reduce the possibilities for confirmation bias, for example, because you would be forced to look at evidence for all the evaluation categories and not limit yourself to evidence in categories that support your preferred evaluation result. For example, if you favor the program and it has a low start-up cost but a large ongoing cost, you might focus on

the lower start-up cost and ignore the ongoing cost. If you establish separate criteria that require you to consider both, you sidestep your confirmation bias.

> Data can bring a different perspective to decision-making than one's personal judgment.

You might also engage different people in evaluating each criterion. This way, you bring different perspectives and prevent anyone's "story" from dominating the evaluation. For example, a common problem when evaluating multiple criteria is the "halo effect," where if the thing being evaluated does particularly well on one criterion, the evaluator then tends to judge the thing better on other criteria as well. So, if our homelessness program was very effective for helping veterans, for instance, someone might then judge the program to be more effective for helping other kinds of people than it actually is. Splitting up the evaluation criteria among multiple people can help you avoid the halo effect.

Enlist the outside view

Enlisting the outside view is about finding a wider pool of evidence to inform judgement. To continue the example of

the new homelessness reduction program, the judgments of staff might be too optimistic about how much the program will cost, how successful it will be, and so on. We could enlist the outside view by looking at other local governments where a similar program has been tried to see how successful it was and how much it cost. These kinds of analogs can be useful for bringing an outside perspective to our potentially biased judgments.

Another way to bring in the outside view is to induct objective data into decisions. Data might bring a different perspective than one's personal judgment, which we saw in the case study.

Prompt multiple construal

As we have seen, we are good at telling ourselves stories. We can harness this talent for better decision-making by using the technique of multiple construal. Decision-makers can be asked to imagine multiple, different future outcomes. This helps people think more broadly about the future, beyond their preferred narrative. Scenario planning is a formal, structured way of doing this. Scenario planning asks decision-makers to consider multiple versions of the future and to think about decisions that would help the organization thrive in any version of the future. Long-term forecasting sometimes uses scenario planning by showing different versions of forecasts. The GFOA book *Informed Decision Making Through Forecasting* describes ways to use scenario planning in forecasting.

Another technique is called the pre-mortem. It asks people to think about the ways a decision could go wrong before committing to the decision. This helps reduce unwarranted confidence about how the decision will turn out and opens up space for thinking about how to mitigate risks.

Calibrate the way you communicate

Finance officers often need to communicate uncertain future quantities, like forecasts. Using probabilities to express uncertainty can help with this. For example, a revenue forecast might be described in this way: "I'm 75 percent certain that revenues will increase by at least one percent next year." Research has shown that people prefer advisors who quantify their uncertainty but are still confident. The phrase we just saw omits hedging language like "maybe," "I'm not sure, but…" and so on, making it come across as confident even though it is expressed as a probabilistic likelihood.

CONCLUSION

People prefer narratives. Numbers can sometimes be underweighted in decision-making or, worse, become nothing more than a tool for confirming our preferred narrative. Recognizing the way in which narratives influence decision-making allows us to employ strategies that use numbers more wisely for making those decisions better.

The content from this article comes from the field of behavioral science. We encourage you to learn more about the growing field of behavioral science and how it can be applied to budgeting. Look for additional articles from GFOA and consider checking out GFOA's recent webinar series on behavioral science (at **gfoa.org/behavioral-science**). 🖪

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