FCSM 2021 Regina Nuzzo

Journalists ~~Behaving Badly~~ Communicating Statistical Information

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UGH, PEOPLE ARE MAD AT ME AGAIN BECAUSE THEY DON'T READ CAREFULLY.
I'M BEING PERFECTLY CLEAR. IT'S NOT MY FAULT IF EVERYONE MISINTERPRETS WHAT I SAY.
WOW, SOUNDS LIKE YOU'RE GREAT AT COMMUNICATING, AN ACTIVITY THAT FAMOUSLY INVOLVES JUST ONE PERSON.

A good complementary marriage

Statisticians

- Good at organizing information
- Good with magnitudes and uncertainty

Journalists

- Good at telling a story for an audience
- Good at capturing and holding people's attention

We know journalists can learn a lot from statisticians.

And many of us are working to make sure they do

But what can we learn from them?

Four Weird Tricks to Steal from Journalists

"Try these the next time you need to communicate statistical information. We were shocked at what happened next!"

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My top four strategies for communicating statistical information to broad audiences

1. Introduce tension 😬

Give us a bit of tension and we're more likely to stick around until you resolve it for us.

My favorite simple approach: *And-But-Therefore*

See Randy Olson's fascinating book on science communication *Houston, We Have a Narrative.*

_____ and _____

but _____

therefore _____.

Situation —> Complication —> Resolution

Example: Philip Bump, *Washington Post*

By Philip Bump
National correspondent

October 7, 2021 | Updated October 7, 2021 at 5:35 p.m. EDT

Since late last year, there's been a wide gulf between the willingness of Republicans and Democrats to be vaccinated against the coronavirus. That continues. In September, Kaiser Family Foundation polling found that Republicans were much more likely than Democrats to say that they intended to never receive a dose of a vaccine.

The importance of this is obvious. The higher the density of unvaccinated people in an area, the more easily the virus can spread — and the more risk of serious illness people in the area face.

And yet it also remains the case that there are more unvaccinated people in counties that voted for President Biden than ones that voted for former president Donald Trump.

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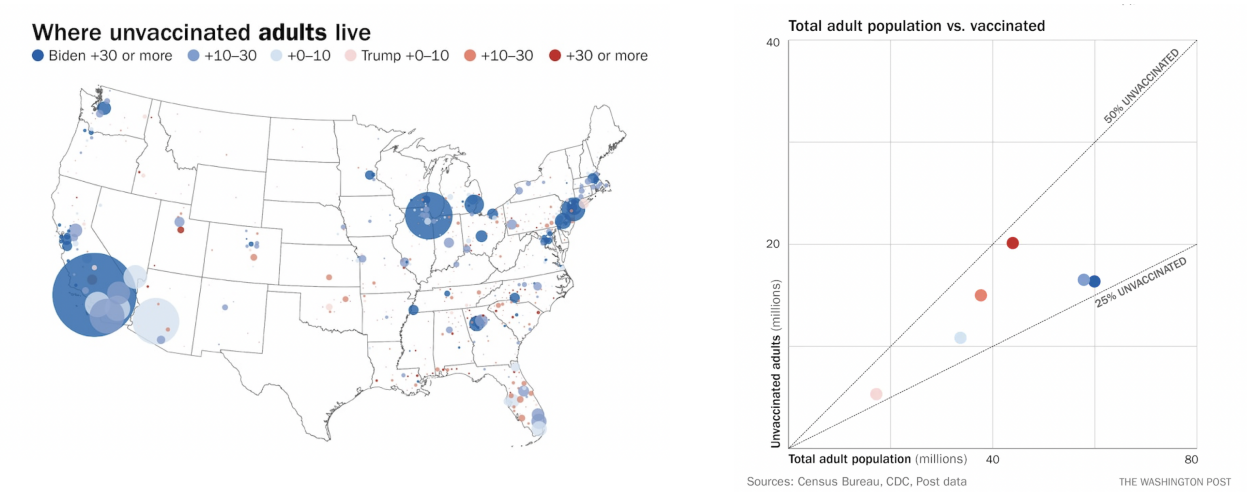
If we map out the areas where unvaccinated adults live, it's mostly — but not entirely — a map of American population centers. You'll notice, though, that there are also a number of red dots smattered across the map, often in places where there are no well-known large cities.



Compare that with

Our analysis found that unvaccinated adults tend to live in large American population centers.

These centers also tended to vote for Biden.

This shows that blue counties tend to be more vaccinated but also home to more unvaccinated people.

The point?

Set the stage

Introduce the tension

Resolve the tension with information related to your main point

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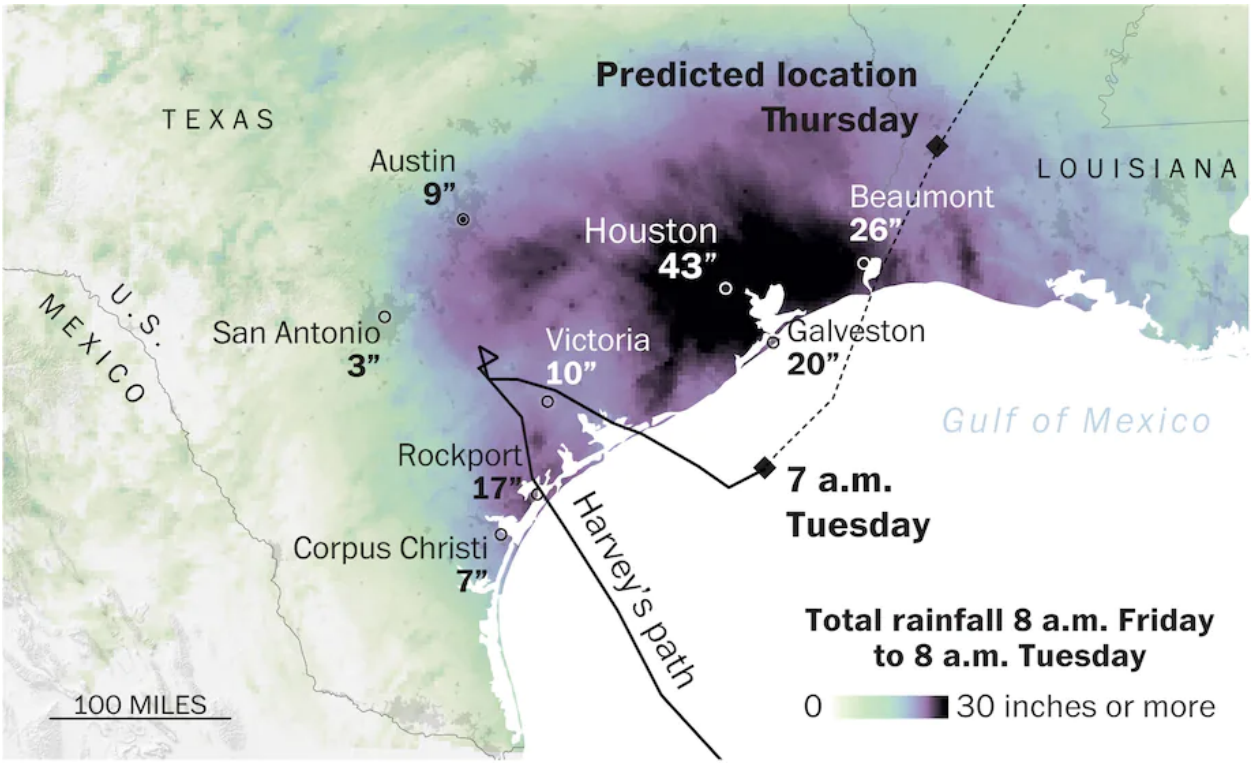
2. Scale numbers to humans 🧑🤝🧑🧑🤝🧑

It's usually easier to reshape the information to fit our brains than try to teach our brains to grasp the information.

Example: Capital Weather Gang, *Washington Post*

"60 inches of rain fell from Hurricane Harvey in Texas, shattering U.S. storm record"

"Harvey unloaded 33 trillion gallons of water in the U.S."



Good, but . . .

Can this be more human-scaled?

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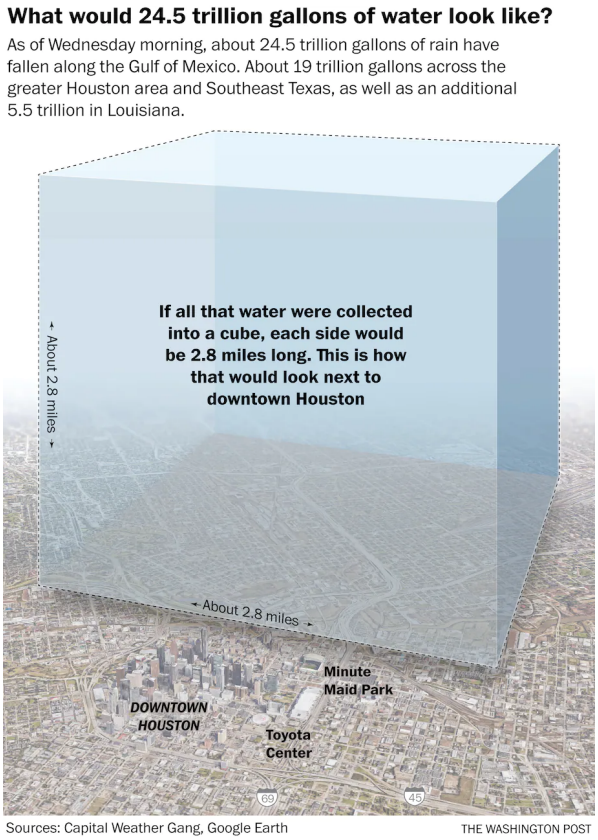
"If we averaged this amount of water spread equally over the lower 48 states, that’s the equivalent of about 0.17 inches of rain — roughly the height of three pennies stacked atop each other — occupying every square inch of the contiguous United States."



A bit better, but maybe . . .

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- If you piled up 20 trillion gallons of water over the District of Columbia (approximately 68 square miles), the height of the water would be 1,410 feet — or almost the height of the Empire State Building. (Ryan Maue)

- Over Harris County alone — which is home to Houston — 1 trillion gallons of water fell in the four days from Saturday through Tuesday. That's as much water as flows over Niagara Falls in 15 days. (Jeff Lindner)

- The amount of rain that fell in Texas and Louisiana would have ended the historic California drought, twice over. (Paul Deanno)

The point?

Relate magnitudes to something that we can see, feel, or otherwise experience.

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3. Season with uncertainty 🧂

Uncertainty is like vinegar: All dishes need a bit of tartness to brighten things up, but no one wants to drink straight from the vinegar bottle

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Example: Ebola vaccine, *New York Times*

New Ebola Vaccine Gives 100 Percent Protection

In a scientific triumph that will change the way the world fights a terrifying killer, an experimental Ebola vaccine tested on humans in the waning days of the West African epidemic has been shown to provide 100 percent protection against the lethal disease.

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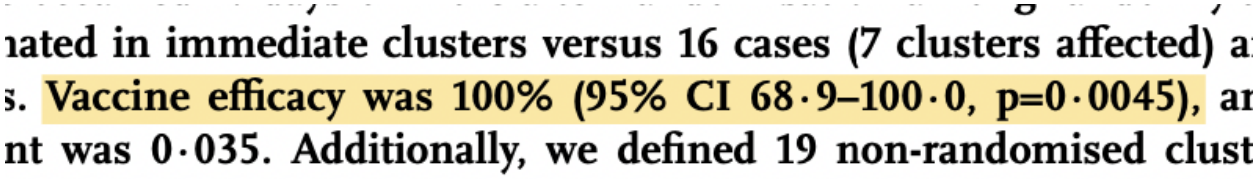

nated in immediate clusters versus 16 cases (7 clusters affected) a
s. Vaccine efficacy was 100% (95% CI 68·9–100·0, p=0·0045), a
nt was 0·035. Additionally, we defined 19 non-randomised clust

Compare that with NPR:

"We were able to estimate the efficacy of the vaccine as being 100 percent in a trial," says Ira Longini, a biostatistician at the University of Florida, who helped test the vaccine. "It's very unusual to have a vaccine that protects people perfectly."

Now, no vaccine — or drug for that matter — is *perfect*. The efficacy of the vaccine is clearly high but not "100 percent." That value reflects the fact that they just haven't tested the vaccine on enough people yet. So it is likely to decrease as the vaccine is used over time. In the end, the efficacy is likely to sit somewhere between about 70 percent and 100 percent, Longini says.

By comparison, the flu vaccine last year was about 50 percent effective.

Further well-balanced uncertainty later

And there are still a few open questions about the vaccine, says Dr. Anthony Fauci, at the National Institutes of Health.

"For example, we don't know how durable the vaccine is," he says. "If you give health care workers the vaccine, for example, how long would they be protected? That's very important to learn."

What is clear is that the vaccine offers short-term protection during outbreaks. And that's exactly what's needed to stop the virus from spreading and to keep small outbreaks from getting out of control.

The point?

We need uncertainty to keep things in perspective. Just don't let it get out of hand, and make sure to leave a finishing taste of what we *do* know.

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4. Make it stick by using expectation and surprise 😲

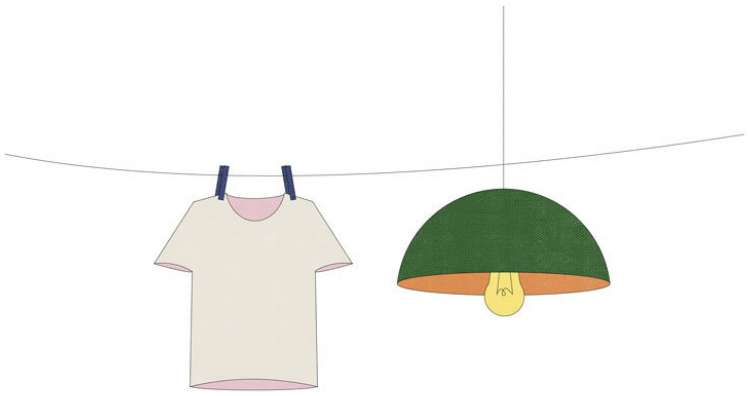
> **Organisms only learn when their expectations are violated.**

— Psychologists Rescorla & Wagner, 1972

Those online newspaper quizzes are more than just cheap gimmicks.

They're also eliciting priors from the audience.

Example: ***New York Times***



Where are the electricity hogs in your home?

Your house generates a lot of greenhouse gasses, but not all the appliances and gadgets are equal.

How many hours could you leave a lamp with an LED light bulb switched on and produce the same amount of greenhouse gases as a single load in a clothes dryer?

Answer

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24

> Incorrect. You could leave an LED light on for roughly 300 hours, or 13 days straight, and have the same carbon footprint as one load in the dryer. In the original survey group, the median guess was 60 hours.
>
> Maybe switch to a clothes line?
>
> (The correct answer range is 272 to 354 hours, depending on the brightness of the bulb.)

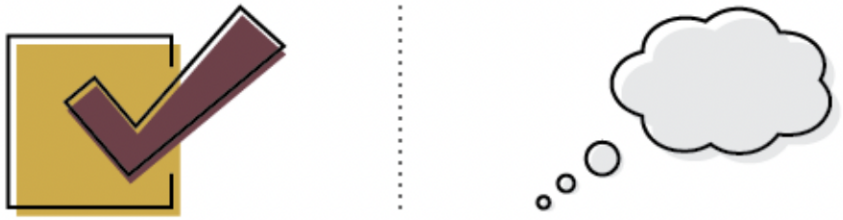
Compare with

"One load in the dryer has the same carbon footprint as leaving an LED light on for 300 hours."

Example: Pew Research Center

PEW RESEARCH CENTER | JUNE 18, 2018

Quiz: How well can you tell factual from opinion statements?



Can you tell the difference between factual and opinion news statements?

Test your ability to classify 10 news statements as either factual or opinion. Then see how you did in comparison with a nationally representative group of 5,035 randomly selected U.S. adults surveyed online between February 22 and March 4, 2018. The analysis of the findings from the study can be found in the full report, "Distinguishing Between Factual and Opinion Statements in the News." Take the quiz and share your results with us on Twitter @PewJournalism.

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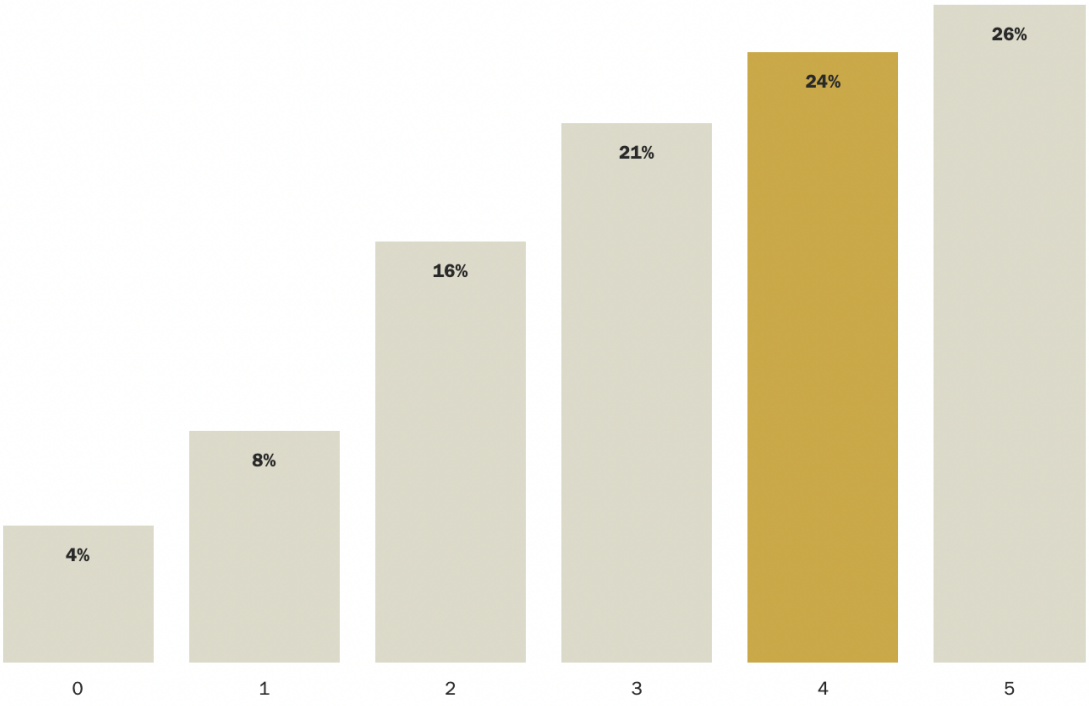
You answered **4 of 5** factual statements correctly



TOTAL NUMBER OF FACTUAL STATEMENTS ANSWERED CORRECTLY

These percentages only reflect the 5,035 adults who took part in the national survey; online quiz results are not included in the sample.

The point?

Prior*Data = Posterior

Context + New Evidence = Updated Knowledge

Expectation + Surprise = Learning

Recap of my four weird tricks

1. Introduce tension
2. Scale numbers to humans
3. Season with uncertainty
4. Make it stick by using expectation and surprise

Thank you!

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