



## The Art and Science of Using Numbers to Persuade (and Deceive)

By LEONG CHAN-HOONG

**Numbers alone do not always paint a reliable portrait, even if they might be the best data and instruments in the field. Instead, people and institutions tasked with collecting and interpreting the figures, play a crucial role in shaping the narrative.**

“Statistics don’t lie, people do” – this was my introduction in Statistics 101 as an undergraduate in the study of statistics in the mid-1990s. The message, delivered with all good intention by my professor, drives home the point that the analysis and interpretation of facts and figures, is as critical as the data itself.

Close to a quarter of a century has passed since my induction to data science. With the advances in

technology and tools in the intervening years, this fundamental truth resounds more than ever today.

Governments, data scientists, academics and market survey firms have created sophisticated techniques to assess the accuracy and reliability of information. This includes the application of big data and artificial intelligence to collate, integrate, simulate and predict outcomes and identify potential sources of change.

Like it or not, we are all part of a modern digitised ecosystem where every aspect of our movement and response are captured, quantified and distilled.

Despite the increased sophistication of data analysis tools and methodology, it has become even more complicated to ensure accurate sensing of our behaviours, sentiments and socioeconomic health. The measurement of matters of the heart, like voters' opinions, customer satisfaction, or employee loyalty, remains elusive and difficult to pin down accurately.

There is a growing public awareness of data malleability partly because of a more tech-savvy consumer base and educated electorate, and greater access to information and social media.

Notwithstanding the technological advancement, developments over the past decade also suggest a deeper, more complex tension between the speaker and audience – and between information and rhetoric.

Simply put, both statistics and people are imperfect. At least three factors have systemically contributed to the distortions and outcomes: self-selection bias, bounded rationality and stereotyping.

### **Self-selection bias**

The first is self-selection bias. To illustrate, the decisions we make are based on the information we have. And this information is derived from the data we collect, which is obtained from the people or events we interview or observe.

So, in a political climate where personal privacy is a growing premium, reliable opinion polling becomes challenging as people shy away from publicly expressing their thoughts, or worse, they give a false but socially desirable response.

If there is any doubt that this is pervasive, look no further than the US presidential polls. In both the 2016 and 2020 campaigns, opinion polls leading up to the election consistently showed that Donald Trump's opponents would win the popular vote decisively – by as much as 10 percentage points.

The outcome? A harrowingly narrow victory either way. Joe Biden won the popular vote with 51.4 per cent (compared to Trump's 46.9 per cent); and in the 2016 faceoff, Hillary Clinton received 48 per cent of total votes cast (versus Trump's 46 per cent).

Importantly, post-mortem analyses point to an under-representation of white, middle-aged men without a college education in surveys. This is the group that is potentially most alienated by the mega forces in globalisation and income stagnation. Yet, there is a great reluctance among this very group to express their political preference publicly, ostensibly due to the stigma attached to Trump, a controversial figure.

Numbers mean little if they do not reflect the intended purpose.

### **Bounded rationality**

Humans have an inherent need to feel good about themselves, the choices they make, and the people they hang out with. Making sense of economic data is pretty straightforward. Getting a yardstick on our cognitive and emotional biases is harder, and not allowing these predispositions to get the better of us, even more so.

In general, we are constrained by “bounded rationality”, where we use a combination of mental heuristics, social norms and imperfect knowledge to help us make an informed judgement. Our anxiety and fear of the unknown

often nudge us to embrace what may seem to be the obvious solution to a problem.

President Trump's successes in stirring up anti-immigration rhetoric is an example of how data can be tactically used for political gains. In one of his prime-time speeches in 2019, he claimed that America suffers from a "security crisis at our southern border" as undocumented immigrants swarmed past the US border with Mexico.

While the number of illegal immigrants apprehended did increase from 303,916 in 2017 to 396,579 in 2018, the figures are a function of tighter, more hard-line border control measures than an actual spike. In fact, according to the US Customs and Border Protection data, the numbers have steadily fallen since the peak of 1,643,769 in 2001.

The interpretation of data was skewed towards the messaging that suited the purpose; in this case, to support the claim that illegal immigration was a rising threat to national security.

### **Stereotyping: "Seeing the world as I see it"**

Finally, in a world where we constantly judge and are judged by others around us, stereotypes about age, gender, race, and so on, abound. What we assume as acceptable public behaviours and norms shape the way we process information and how we react to it.

Using the Trump example again, we can find many instances of how the administration created its own narrative, using "alternative facts" to describe a given situation as perceived from a specific viewpoint.

On 21 January 2017, White House Press Secretary Sean Spicer accused the media of deliberately underestimating the size of the crowd for President Trump's inaugural ceremony.

He declared that the ceremony had drawn the "largest audience to ever witness an inauguration – period – both in person and around the globe".

According to rapid transit ridership data and photographic evidence, Spicer's claims and allegations were blatantly false. Aerial images showed that the turnout for Trump's inauguration was lower than the turnout for the 2009 inauguration of Barack Obama.

Spicer claimed that 420,000 people rode the DC Metro on inauguration day 2017, compared to 317,000 in 2013. In fact, actual ridership figures between midnight and 11 AM were 193,000 in 2017, and 317,000 in 2013.

Never mind that many observers point to the "proveable falsehoods" uttered by official spokespersons within the Trump administration. "Alternative facts" are an apt description of how data can be interpreted wilfully and deliberately distorted.

### **Nudging behaviour**

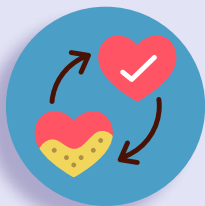
Statistics can be used to nudge behaviour.

Nudge theory is a concept in behavioural economics that proposes positive reinforcement and indirect suggestions to influence the behaviour and decision-making of groups or individuals. Nudging contrasts with other ways to achieve compliance, such as education, legislation or enforcement.

The nudge concept was popularised in the 2008 book *Nudge: Improving Decisions About Health, Wealth, and Happiness*, by Richard Thaler and Cass Sunstein. It has influenced politicians and public policy.

See box, "Examples of Nudging Behaviour" for cases of how data and information have been

## Examples of Nudging Behaviour



### HOTA

The Human Organ Transplant Act (HOTA) allows for the kidneys, heart, liver and corneas to be removed to transplant to another patient in the event of death of an individual from any cause. The Act empowers the state to harvest clinically dead organs for the benefit of another living person.

To encourage take-up, HOTA has been decreed as an “opt-out” policy. The default choice is to subscribe to organ donation, one that requires the least cognitive deliberation. As the topics of death and afterlife are taboo subjects in general, this public policy has achieved relative success in take-up rates.



### Utilities

Similarly, a household’s monthly utility bill is benchmarked against the normative consumption level in the neighbourhood. In other words, it is not just the absolute cubic meters of water or kilowatt-hours of electricity we use, but where we stand in resource utilisation when compared with others in the residential estate.

This plays on the human instinct to want to be a part of the mainstream. We have a yearning to do the right things and to be liked for doing these things. This proclivity gives ammunition to utility service providers in shaping the way we consume resources.



### MRT

The Land Transport Authority employs prominent signage on its trains to inform that the majority of commuters will “move in to the centre of the train for others to board”, and “give up their seat to those who need them more” (96 per cent and 94 per cent, respectively). These statistics serve as the blueprint for social compliance as commuters want to do right and behave as the majority do.

presented to influence public perception and behaviours in Singapore.

### It’s not the numbers, but the narrative

In the end, statistics are not the sole deciding variable. The human touch makes the difference.

Numbers, like people, are imperfect and multifaceted. These flaws constitute the foundation for mavericks to build their political fortune.

For the rest of the mortal souls? Spare us from the number crunching, please. ■

*Leong Chan-Hoong is Associate Professor at the Centre for Applied Research, Singapore University of Social Sciences. He is the Singapore National Representative for the World Association for Public Opinion Research, and the Chair for the Rae and Dan Landis Outstanding Dissertation Award, at the International Academy for Intercultural Research.*