Gap Instinct

Idea In Short

Hans Rosling was a medical doctor and Professor of International Health at Karolinska Institute in Sweden. He was also the co-founder and chairman of the Gapminder Foundation and a popular TED speaker. His book, Factfulness, was widely lauded, also by Bill Gates. The Gap Instinct is the 1st among the 10 instincts identified in this book. This instinct describes our tendency to divide things into two distinct, and often conflicting groups, with an imagined gap in-between.

The gap instinct highlights how people tend to divide data into two groups (e.g. us and them), which often results in our overlooking the majority.

The Gap Instinct

For example, dividing economies into two groups no longer make sense1. It does help us understand the world in a practical way. Professor Rosling and his co-authors - his son Ola Rosling and daughter-in-law Anna Rosling Rönnlund - prefer to talk about four levels of income, which they say give a far better picture.

> Eighty-five percent of mankind is already inside the box that used to be named ‘developed world.' The remaining 15 percent are mostly in between the two boxes. Only 13 countries, representing 6 percent of the world population, are still inside the ‘developing' box.

However,

> There is no gap between the West and the rest, between developed and developing, between rich and poor. And we should all stop using the simple pairs of categories that suggest there is. Only 9 percent of the world lives in low-income countries. Low-

> income countries are much more developed than most people think. And vastly fewer people live in them. The idea of a divided world with a majority stuck in misery and deprivation is an illusion. A complete misconception. Simply wrong. The majority of people live neither in low-income countries nor in high-income countries, but in middle-income countries. This category doesn't exist in the divided mindset, but in reality, it definitely exists.

Furthermore, according to Rosling, our most important challenge in developing a fact-based worldview is in realizing that most of our 1st-hand experiences are from Level 4. The mass media, which loves non-representative extraordinary events and shuns normality, filters our 2nd-hand experiences.

Overcoming Gap instinct

To control the gap instinct, look for the majority. According to Gapminder:

> Factfulness is . . . recognizing when a story talks about a gap, and remembering that this paints a picture of two separate groups, with a gap in between. The reality is often not polarized at all. Usually the majority is right there in the middle, where the gap is supposed to be. To control the gap instinct, look for the majority.
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> - **Beware comparisons of averages.** If you could check the spreads you would probably find they overlap. There is probably no gap at all.
> - **Beware comparisons of extremes.** In all groups, of countries or people, there are some at the top and some at the bottom. The difference is sometimes extremely unfair. But even then the majority is usually somewhere in between, right where the gap is supposed to be.
> - **The view from up here.** Remember, looking down from above distorts the view. Everything else looks equally short, but it's not.

The Flaw of Averages

Averages can be tremendously dangerous and misleading. According to a Harvard Business Review article titled, The Flaw of Averages2 by a Stanford professor, Sam Savage:

> Executives' desire to work with "a number," to plug in an average figure, is legendary. But whenever an average is used to represent an uncertain quantity, it ends up distorting the results because it ignores the impact of the inevitable variations. Averages routinely gum up accounting, investments, sales, production planning, even weather forecasting. Even the Generally Accepted Accounting Principles sanction the "flaw," requiring that uncertainties such as bad debt be entered as single numbers.

Savage explains that most of us consistently make this mistake when we substitute single number estimates, often expressed as average values, into a model, especially when there is uncertainty at play. Single numbers, such as averages, are easy to understand and work with. However, they almost always result in flawed analyses and poor business decision making when used as proxies for distributions.

> On average, a dog and a chicken have 3 legs. Likewise, there is a well-known joke that the average body temperature in a hospital is 36.6 C. It means that some people are feverish and others are in the morgue.

Tips for consultants

As consultants, you need to be smart and nuanced when you are describing a distribution. Be careful of extremes. When presenting your analysis:

1. Always include measures of dispersion, such as variance / standard deviation when using averages
2. Consider multiple data summarization techniques, such as median, minimum and maximum values to get a holistic view of the data
3. If you eliminate outliers from the data set, document what you removed and the justification
4. Always keep a copy of the raw data

Fortunately, there are established techniques and accessible tools to harness the uncertainties in forecasts instead of looking the other way or settling for an easier (but flawed) alternative.

Use alternative approaches

Monte Carlo simulation analyses provide experimental forecasts of the consequences of decisions in a probabilistic way. This technique packs a big punch by modeling thousands of single numbers into one spreadsheet cell as a distribution of inputs. You can adjust multiple parameter inputs, including distributions, to run sensitivity analyses (e.g., how much revenue could we expect for different levels of marketing spend?) and stress test various expected outcomes (e.g., what are the probabilities that demand for our new product will exceed our delivery capabilities if we do nothing or increase our production capacity?). The name Monte Carlo simulation comes from the computer simulations performed during the 1930s and 1940s to estimate the probability that the chain reaction needed for an atom bomb to detonate would work successfully. The physicists involved in this work were big fans of gambling, so they gave the simulations the code name Monte Carlo. Simulation enhances your analyses with interactive, dynamic calculations that will equip you to begin looking for answers to even more interesting questions, such as:

- How wide are the variations in an expected outcome?
- How frequently should I expect them to occur?
- What are the root causes of these variations?
- What can I do to reduce their impacts?

Monte Carlo simulations reduce subjective probability to frequentist probability. However, this method is prone to category errors whenever they happen. This is one reason that financial instruments designed using Monte Carlo models collapsed during this financial crisis3. These simulations cannot predict something unprecedented happening – what Nassim Nicolas Taleb calls - The Black Swan.4 Nevertheless, the Monte Carlo approach is better than simple averages under normal operating business environments.

Who uses Monte Carlo simulations?

According to Microsoft:

- General Motors, Proctor and Gamble, Pfizer, Bristol-Myers Squibb, and Eli Lilly use Monte Carlo simulations. They use this technique to estimate both the average return and the risk factor of new products. At GM, this information is used by the CEO to determine which products come to market.

- GM uses simulation for activities such as forecasting net income for the corporation, predicting structural and purchasing costs, etc. It also uses these simulations to determine its susceptibility to different kinds of risks, such as interest rate changes and exchange rate fluctuations.
- Lilly uses simulation to determine the optimal plant capacity for each drug.
- Proctor and Gamble uses simulation to model and optimally hedge foreign exchange risk.
- Sears uses simulation to determine how many units of each product line it should ordered from its suppliers. For example, it uses Monte Carlo simulation to calculate the number of pairs of Dockers trousers it should ordered this year.
- Due to the long-term nature of their projects, oil and drug companies use simulation to value real options. These companies use such simulations to calculate the probability of an option to expand, contract, or postpone a project.
- Financial planners use Monte Carlo simulation to determine optimal investment strategies for their clients' retirement.

Summary

As consultants, we see the gap instinct all the time - in industry reports, survey results and competitor pitches. Such communications portray particular threats, vulnerabilities and business impacts as a major concern that require immediate attention. In reality, they actually are outliers and don't necessarily represent the majority of situations for many client organisations. Often, there is a spread between two groups or values, with the majority in the middle. In fact, it is likely there are few to no gaps and no separate groups. When presented with two apparently contrasting groups or numbers, investigate and look for the majority. Understand what the complete data set looks like as a distribution. Use multiple summarization techniques, such as the mean, median and mode.