

KILROY CAFÉ

Philosophy for the Modern Age

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Life is Logarithmic!

**An oddity of statistics
may help you make
better personal decisions.**

By GLENN CAMPBELL

Believe It Or Not!... If you collect a set of numbers from almost anywhere in the universe—such as sports statistics, heights of trees, incomes of workers or masses of stars—a bizarre phenomenon usually emerges. Far more of those numbers start with “1” or “2” than with “8” or “9”.

Try it yourself: Open your local phone book and look at the house numbers (e.g. “342 Park Ave.”). Make a tally of the digits that each of those numbers begin with (in this case “3”). Once you collect a few pages of this data, a pattern usually becomes clear: There are far more house numbers starting with low digits like “1” than high digits like “9”!

This statistical phenomenon is called Benford’s Law, and it happens in most forms of collected data from nature and human activity—regardless of what you measure or the measurement system you use. It seems at first to defy all reason. Since each measurement seems random, shouldn’t the leading digit be random, too?

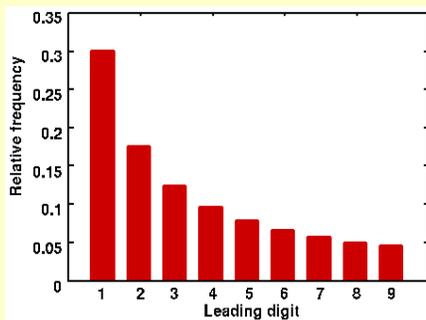
The phenomenon arises because real-world data is never completely random. It is distributed in a certain way, typically weighted toward the low end of whatever scale you are using.

Take the phonebook example: In most of the world, there are far more short streets than long ones. All streets will have low numbers but only a few will have high numbers. Thus, on aggregate,

...Not Linear

there will always be more 1’s than 9’s, more 10’s than 90’s and more 100’s than 900’s. Get it?

The same thing happens everywhere: There are more short trees than tall ones and more average sports players than exceptional ones. People earning \$15k a year will always outnumber those making \$95k, and people making \$100k will always outnumber those making \$900k. That’s how the digits get skewed.



ones. It is also usually true that when something happens repeatedly, the largest impact is at the beginning, with diminishing effect later. Once you understand these logarithmic distributions, you see them everywhere.

This isn’t just a phenomenon of statistics but of human happiness, desire and need, all of which follow logarithmic curves. If you grasp the curve, you may see that you have been approaching life with inappropriate math.

For example, if a little of something makes you happy it doesn’t necessarily follow that twice as much of the same thing will make you twice as happy. If that were true, it would be a linear relationship. Real life, however, abhors straight lines. It is more likely to give you decreasing satisfaction when you do the same thing repeatedly. Economists call this the Law of Diminishing Returns.

You may be happy if someone gives you \$1 million, but you wouldn’t be ten times happier if they gave you \$10 million. Truth is, \$1 million, thoughtfully used, is plenty for most of us. Any additional money only encourages us to be less thoughtful. In the end, the additional \$9 mill will have only a marginal impact on our lifelong happiness, if any.

So why does anyone bother seeking more than they reasonably need? Good question!

People, it seems, are much better at thinking linearly than logarithmically. Linear conclusions are much easier to calculate and understand. Twice the chocolate must mean twice the joy. All you need for this math is addition and multiplication, not any fancy calculus.

It takes great maturity—and some bitter experience—to anticipate your own changing needs, especially if you are excited about something right now. Every kid learns his lesson: One cookie is good. A whole big package eaten at one sitting; not so good. On bigger issues, though, adults may take years to grasp the non-linearity of life, and by that time it is often too late.

The worst mistakes of individuals and nations are when they try to impose a linear prediction on a curve, cycle or feedback loop. They take the trend of recent events, project it forward in a straight line then make irrevocable commitments based on that prediction.

Reality, however, has no respect for our predictions. It does what it wants, which is usually to adjust to a stimulus and respond to it differently over time.

If you have committed yourself to a straight line, that’s your problem.

—G.C.

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