

1 Factful Lies

1.1 Introduction

The real strategy of a professional propagandist is not merely to lie to you, but to destroy the meaning itself.

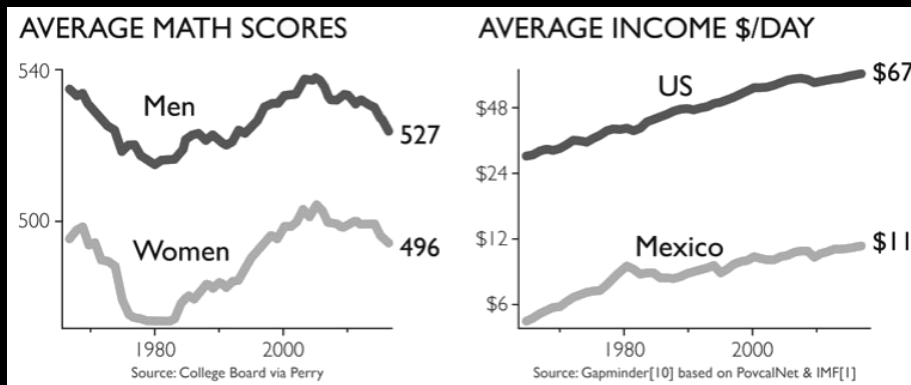
There are many books that claim to dispel the manipulation of statistics, but none of them is telling you the whole truth. Those are mainstream books, and they carefully avoid undermining the mainstream propaganda, by merely touching the surface of statistics, and limiting themselves to condemning already famous fallacies that are already condemned by Wikipedia.

When I read Hans Rosling's "Factfulness" I was **MOVED** by the depth of his lies and manipulations! Such depth has never been described and it requires a serious analysis. Rosling lies subtly, creatively, and intensely, so the analysis is not going to be boring, I have **ENJOYED** unraveling it a lot! On the other hand Rosling packs his lies so densely it took me several chapters to unravel a single statement of his. Thus I limit my analysis to just a few (most important and most widely used) lies and tricks in order to avoid writing a whole boring book comparable to the wicked "Factfulness" itself.

Rosling is not a **NO-NAME** example, he is a high profile liar endorsed by Bill Gates himself (who is probably your hero – one more reason to rethink your heroes).

1.2 The Gap Size

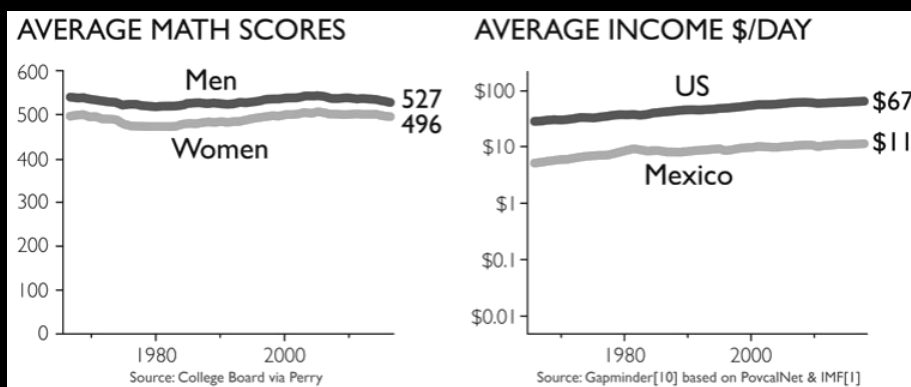
On page 33 Rosling prints a pair of comparisons: average maths scores by gender for American college students in 40 years, and average daily income in USA vs Mexico for the same 40 years.



Note the scale and the interval of the “Y” axis. The axis is arbitrarily truncated so that to make the graphs fill the entirety of each picture. It seems a reasonable presentation, but it does not give us adequate visual perception of the size of the gap relatively to the magnitude of the plotted value. This presentation emphasises the gap out of proportion, but shows us verily that the gap is very persistent.

Rosling is unhappy with the inability to assess the gap’s size. He writes: *When we compare two averages, we risk misleading ourselves even more by focusing on the gap between those two single numbers, and missing the overlapping spreads¹, the overlapping ranges of numbers, that make up each average. That is, we see gaps² that are not really there.*

His argument coincides with the truth, but the observed gap-emphasis that angers him has in fact nothing to do with the plotted numbers being average. The nature of this numbers does not affect the visual misrepresentation of the gap, that is caused solely by the truncation of the “Y” axis. So he changes the scope of the “Y” axis:



¹By “spread” Rosling means distribution.

²Beware! He conflates two different notions of “gap”: one is a difference between two values as seen on the graphs above (and discussed in this section), another is a lack of overlap between two sets as seen on the distribution graph (and discussed in the next section) Here he already alludes to this second version of “gap” which he will use later but will never explicitly define, he quite purposefully appeal to your language intuition, which is a profound fallacy in and of itself! He does that consistently for the rest of the book, pay attention to each mention of “gap”.

Rosling describes the result as: *Using the same numbers, we now get a very different impression. Now the “gap” seems almost gone.*

On the first glance the math graph seems legit. The gap looks exactly what it is, and it is way smaller than before.

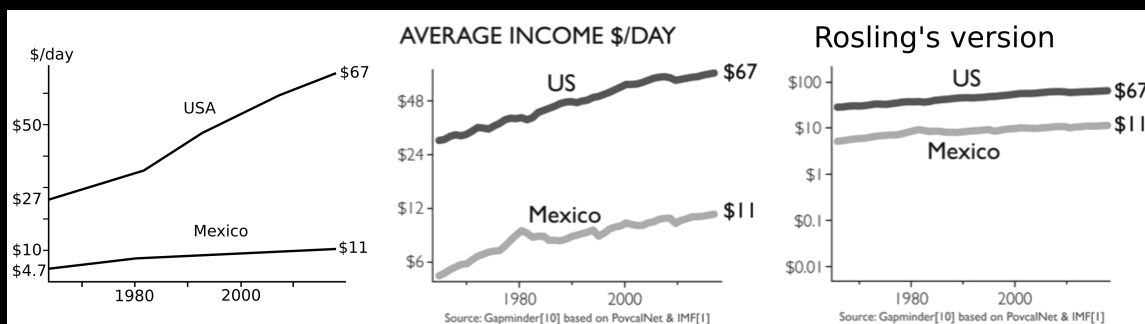
On the income graph the gap also shrank... But you may notice the “Y” axis is LOGARITHMIC! It means the value of vertical intervals along the axis are not equal, the bottom tick represents \$0.99 and the top tick \$99, so the gap that is visually smaller than the distance to the bottom of the graph is in fact several times larger in absolute numbers. Rosling presented a counter-intuitive visual comparison that inflates small numbers and deflates big numbers. This is a lie.

Moreover, where is the zero on this graph? There is no zero. Logarithmic scales do not have zero. Rosling chose to stop at \$0.01 but he could squeeze another tick on the axis: \$0.001 – it would reduce the visible size of the gap by another 20%, and then one more \$0.0001 and as many as he likes. So that his way of truncating the “Y” axis IS EQUALLY AS ARBITRARY as before – he did not improve the honesty of the representation!

If you still believe that Rosling is lying in good faith, you must notice that the original scale of the “Y” axis was also logarithmic. Got me? On the contrary!

This scale was made logarithmic in order to COMPRESS the gap visually in order to fit it into the graph, because the real size of the gap is literally OFF THE CHART. If you imagine decompressing the original logarithmic axis into its linear equivalent (doubling the height of each tick as it represents twice the increment in \$/day) the gap will visually magnify two times and the last value \$67 will go up almost four times.

Here is what the gap looks like on a linear scale with true zero. I put all three graphs side by side for comparison, pay attention to the scale of the “Y” axis, in my version it is significantly compressed.



Reading the original logarithmic graph and its linear equivalent side by side, we can now see how grossly Rosling's graph misrepresents reality. The original graph

does not emphasize the gap, contrary to the Rosling's accusation. Even though I compressed my linear graph to the same height at the mark "\$67", the original graph still downplays the gap – take a look at the right end – the mark "\$11" appears twice higher than it really is. And not only that, the original graph also hides the fact that the gap is growing!

It is possible that this concealment was not intended – more reason to be careful with statistics representation! Imagine those people, out of malice or otherwise, fooled themselves while playing with the "Y" scale of the plot. So little, so seemingly harmless input, affected the perception so much, hiding a major effect in plain sight!

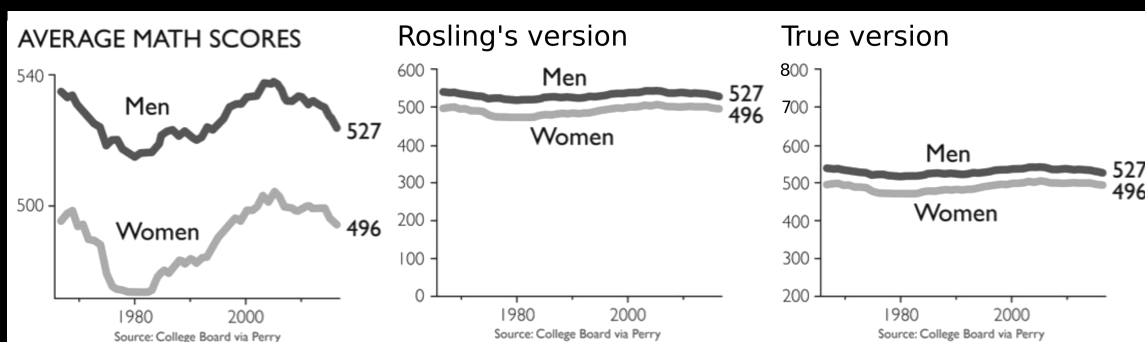
1.3 Not Even Size

But what about the maths scores graph? It was legit anyway, wasn't it? Could it be that Rosling made a mistake, not a lie.

First, let's take a closer look to the "Y" axis that worries Rosling so much. Rosling draws the "Y" axis that spans from 0 through 600. But, this is a SAT score¹ axis. According to "SAT Suite Of Assessment": *A test score for the math test is reported on a scale of 200 to 800* [1]. So that the Rosling's variant of the "Y" axis is less valid than the one he criticized.

The comparison of the absolute scores to an imaginary zero as presented by Rosling is A LIE (scores below 200 are not even defined). A true comparison of maths scores could only be against some other set of factually issued scores (which constitutes the gap we started with, and there is nothing to compare this gap's size against).

I have drawn all three versions of the graph side by side for analysis of the misrepresentation tricks:



¹"Scholastic Aptitude Test" a standardized test widely used for college admissions in USA.

He blatantly squeezes 200 non-existing points into the bottom of the graph, and crops the top 200 existing points off. Although, this mendacity does not affect the perceived size of the gap, it has the following effects: creates false impression that the axis is not truncated and deepens the illusion that the axis is indexed with numbers, pushes the plot away from the bottom, so that to misrepresent the female's graph as being very close to the absolute top (whereas the absolute top is 200 points beyond the top edge of the picture).

Among these the illusion of the “Y” axis being indexed with numbers is the most important. Because it is in fact indexed with *score points*, which are not numbers! The difference is fundamental, and because of that is always overlooked. Do not laugh! On this difference our interpretation of the graph depends crucially.

If you now think that you clearly see numbers on the graph: “200, 300, 400, ...”, and I am mad suggesting otherwise, then we need a brief excursion into basic math that was not properly discussed in your elementary school.

What are numbers? This is not a question to which we can give a definitive rigorous answer without drowning in the category theory. The most fundamental notions are the most difficult to define, such as a point, or a line... But we can provide sufficient comprehension of the bounds of the notion in question, mostly by referring to its properties. The basic intuition is: *a number is a count or measurement*¹. This already gives us a lot of insight about numbers that concern us in the present context. In particular, numbers measure size of geometric shapes. For example, real numbers on the income graph measure the sizes of the graph's features, and this correspondence between numbers and perceived sizes is the very meaning of plotting graphs. In order to see why this is not the case for the SAT scores graph we must look at the properties of numbers, and examine how the properties of numbers correspond with our perception of graphs.

Before anything else numbers are ordered.

Then arithmetic operations are defined on numbers: we can add and multiply numbers, but more importantly divide and subtract. The subtraction gives us the notion of distance – we can know how far apart two numbers are. We can see that 200 and 300 are equally apart as 300 and 400. Among the numbers there is 0 with it's

¹This intuition excludes many interesting mathematical concepts that are also called numbers in mathematics and share some properties with numbers, such as complex numbers and quaternions – these constructs are totally irrelevant to the present context – they extend the core idea of numbers beyond what is concerning us about counts and measurements, and this extension inevitably causes loss of certain important properties (extending from Real to Complex we lose order, extending from Complex to Quaternions we lose commutativity – although we can produce real numbers as a subset of quaternions it would be a stretch to call quaternions “numbers” as the superset don't inherit the properties of the subset).

wonderful properties, and equally wonderful 1, giving us additive and multiplicative inverses.

These are the properties that allow us to speak about “income gap”, “rate of change”, and how many times B.Gates is richer than H.Rosling. ...and plot and read graphs. With the proper understanding of arithmetics we have read even the Rosling’s rigged income graph and extracted truthful information from it.

It is important to stress, we comprehend numbers due to the operations we can perform on them. When we look at the income graph, we automatically perform dozens of mental transformations of the picture, we divide it in parts and mentally fit a part into another to see how many times it fits.

The extraction of visual parts is equivalent to subtraction – we determine how far apart two plotted values are. Then we fit this distance onto the “Y” axis – it is equivalent to division. These operations must be defined beforehand. For real numbers they are defined. In our brain we operate with geometric shapes, but we translate the result into real numbers – with numbers the translation is perfectly legit. It does not matter that you do not write these operations in usual arithmetic notation, you perform subtraction and division in the most practical unmediated way¹ even though you never thought about it as arithmetic operations². As long as the graph represents values that allow meaningful subtraction and division (numerical values), your intuition with geometry and numbers works validly for the represented values.

What about the scores? Do they have these properties? Certainly the scores are ordered. ...and nothing more.

We can not add them: two times scoring 300 points on your test or exam does not amount to 600. We can not divide them: you can not score half points for half-test. And subtraction is so unthinkable that I can’t even give you a remotely practical analogy for subtraction of score points. Whereas subtraction is the foundation for defining distance.

A meaningful 0 does not exists in the space of SAT scores!

¹Historically and logically the geometric representation of values comes before digital, and is indeed more intuitive, and played the central role in classical mathematical education until the industrialisation of education.

²This is, by the way, exactly the reason why logarithmic scales tend to fool you: your brain automatically rushes to subtract values and internalize the result, but the subtraction of exponents does not produce the expected result. Ultimately, logarithmic scales are comprehensible, because they are rigorously defined and the subtraction of exponents has its own meaning, but it takes some training to develop the much more sophisticated intuition required for comprehending logarithmic scales.

A 1 seems to exist, nominally, but it is not a real unit 1, it is fake. A true unit 1 score point creates an equidistant grid in the score-space: 1 above 500 is the same value 1 as 1 above 0 – which is not the case. The value of a 1 score-point varies! The difference between 800 and 799 could represent a distance between Isaac Newton and an average bookkeeper. The difference of 600 and 590 could mean a threshold of functional numeracy. Whereas the interval from 500 through 200 represents a spectrum of indistinguishable states of clinically determined mental disorder.

The notion of distance is not defined on the SAT scores. The scores are not numbers!

In statistics we have a special name for this class of objects: *categorical variable*. An individual of this class designates a so called category, a predefined subset of possible outcomes, as opposed to some measurement (for which numbers work just fine). For example the marks given to American schoolchildren constitute a categorical variable that assumes values from the set {A, A-, B+, B, B-, C+, C, C-, D+, D, D-, E+, E, E-, F+, F}. Total 16 possible categories to which a particular work/performance could be assigned. A mark designates the quality category of a work/performance. We know that “A” is better than “F” but there is no QUANTITATIVE measure of distance between “A” and “F”.

Same with SAT scores! The scores are categories. There are very many of them, total 601 from the set {200, 201, 202, ... 799, 800}. They are enumerated, but they are still categories, not numbers. The digits in SAT scores designate NAMES of individual categories: Bob performed for the category “475 points”, Alice fell into category “507”. “475” and “507” are names! You can not calculate an average of names, you can not add names, you can not find a quotient of names.

The digital notation of the scores does not imply that these scores are numbers! This is nothing more than a chemically pure case of the *abuse of notation* – a misrepresented object fraudulently inherits properties of the notation itself, in this case the decimal notation of numbers donated its properties to the score points.

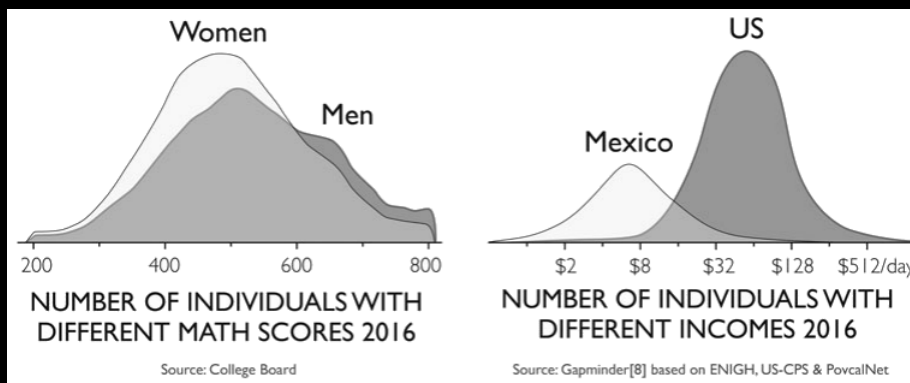
An extraordinarily popular abuse of notation! In fact all normal stupid schools and all government's institutions practice this fundamental mistake every day without ever noticing. It is by now a part of human culture, a tradition. If your teachers used digital notation for marks (such as the case for many European schools), you might remember they often “calculate” your “average mark” by adding up all your marks as if they are numbers and then dividing them by their amount. The resulting garbage (not even a number!) was used in many reports and other useless official documents. Yes, I am saying your teachers are brain dead morons, and I mean it. In Soviet schools this method was 100% official flowing through the veins of education departments of all ranks and the ministry itself, and even my MATHS teachers practiced it. In this

regard Rosling did not invent his own stupidity, but he put this one to a very subtle use.

All in all the Rosling’s presentation of the maths scores is even less valid than his deliberately misleading presentation of the income gap. Whereas the income gap is after all a number and we can comprehend its size when we plot it differently, and see how far from the truth a deceitful representation is; the scores gap has no size at all, because the distance is not defined in the space of scores, all these Rosling’s tricks and machinations were void from the start, there was no value to misrepresent. He crafted a lie that is NOT EVEN FALSE!

1.4 The Distributions “Overlap”

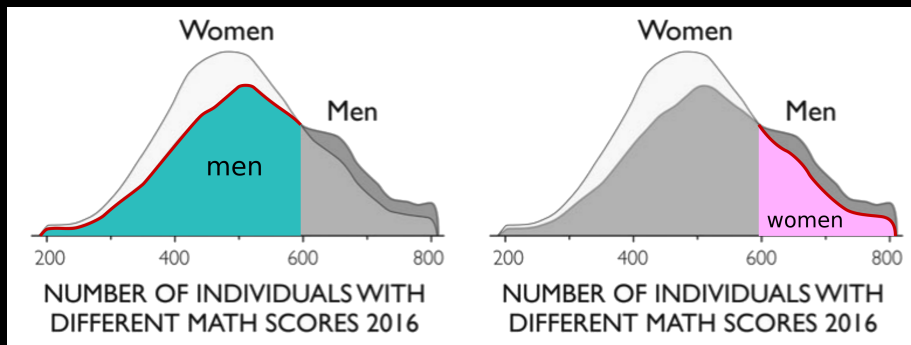
I will show you shortly how to deal with scores honestly and meaningfully, but there is more of the lies to unravel first. Behold the distributions, which initially motivated Rosling to deny the perceived gaps.



With these distributions graphs Rosling lies to you about the same gaps in a very different way. He writes: *Look! There is an almost complete overlap between men’s and women’s math scores.*

What is “overlap”? And what do we perceive as overlap on these pictures? Apparently the eye picks up and compares the area (or it tries to) of the three coloured regions. What does area on these graphs represent? It simply represents the amount of tested subjects. An integral of the distribution function gives you the size of the sample. What does the highlighted area (the “overlap”) represent then?

The graphs intersect at 598 points (as far as we can read it at the present resolution). So the “overlap” area is a sum of two integrals shown on the following picture:



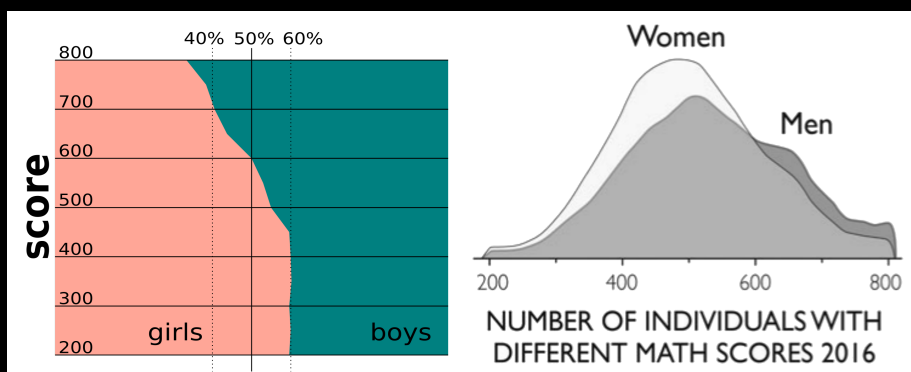
It is very easy to see that below 598 Rosling calculates the amount of men, above 598 he calculates the amount of women. Then he sums them! – this is exactly what the overlap area is. He sums some men with some women, cars with airplanes, nails with tables... **On this distrubution graph Rosling displays a value that HAS NO PHYSICAL MEANING WHATSOEVER and wants you to look at it in astonishment.**

Note that he also called this value “overlap of the scores”, whereas the displayed value (the area) represents PEOPLE – it is a whole another dimension! Not only he made up a fake meaningless value, he also mislabeled it.

When it comes to incomes in Mexico and the United States – the gap is so huge that the distribution graphs do not help to hide it, so Rosling simply talks is down: *the overlap is there but it is only partial*. – “partial overlap” what is it? A new word in set theory? Was the scores “overlap” non-partial? Then he moves on joggling emotional connotations of “gaps”, “separation”, “apartheid” – which is a topic for another chapter, how do they tarnish data with emotions by applying inapplicable words to it, especially when data itself is not confusing enough.

Some Honesty For Contrast

What would be an honest presentation of the math scores data? It would be stunningly opposite to the Rosling’s approach: the most honest and time tested method is the gender proportion by score.



I acquired this data from the Rosling’s graph, by literally measuring it with an on-screen measuring tool. It is not important if his graph is truthful, it only matters for us that the data is the same (as far as my measuring accuracy goes). I want to show you the difference between an honest and a dishonest presentation of the same data.

The entire area is 100% of the sample, the area of “girls” and “boys” are total for respective genders; horizontal strips represent score intervals; and the area proportion of ANY horizontal strip represents the true gender proportion within the score interval represented by the strip.

Isn’t it clear and intuitive? And it is not even my invention! – this type of graphs exists since the dawn of statistics. If you see it first time in your life, you are now safe to conclude that clarity is not among the goals of the official, political and celebrity statisticians.

Enjoy the sheer audacity of Rosling, he supplies his version of the math scores graph with the comment: *Let’s get a better sense of the reality behind the numbers.* “Reality” he imagines behind the “numbers” that are not even numbers.

In addition this honest graph reveals a mistake often made by the majority people in perfectly good faith. When people only pay attention to overall characteristics of the maths-scores distributions they notice that boys exhibit greater variability than girls. Which is a perfectly valid observation, girls indeed flock closer to the mode of their distribution. And as there are apparently more genius boys than girls, people tend to assume that there must be also more imbecile boys than imbecile girls. It could possibly be true, but it is factually false. It is clear in the graph that girls dominate the imbecile range of maths scores.

Note that for the correct interpretation of this graph we do NOT require scores to possess properties of numbers! The proportion we picture and analyze, lies in the dimension of the amount of tested students – it is a numerical dimension. And the scores axis DOES NOT represent any quantities, sizes, distances! It is filled – it represents only the order, and the order is a valid property of the scores. And this is exactly how we deal with categorical variables in general!

There is an anecdote about Lev Landau. Landau was well known for praising female beauty. He defined 5 categories of beauty, and taught his students to do this categorization. He entertained himself by collecting statistics and running virtual contests of female beauty between various organizations, cities, countries. When his students paid visits to other faculties or universities they rated all female encounters and kept notes. They brought their notes to Landau and collectively aggregated the information for mutual amusement (yes, Landau’s meetings with students were that much fun).

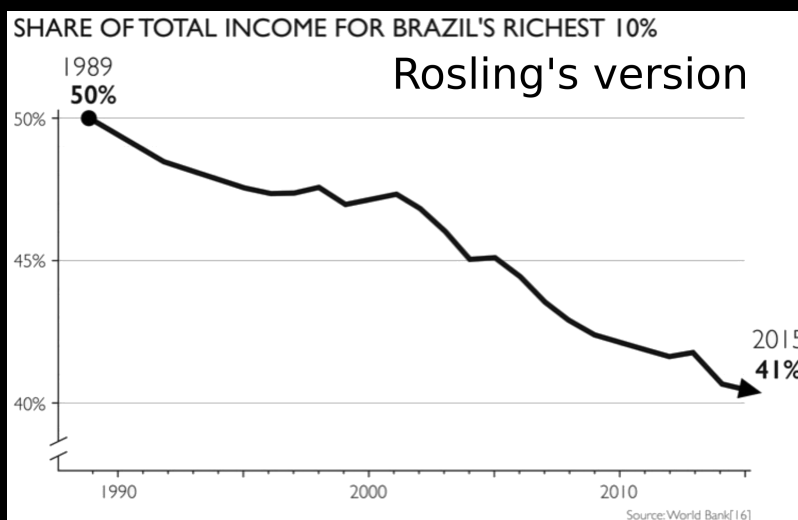
Here is approaching a punchline. I have heard of similar entertainment (apparently borrowed from Landau) in quite a few various places of high education. Professors (including PhD in maths!!!) were calculating “average rank” by summation of the individual rank identifiers {1,2,3,4,5} divided by the sample size. This atrocity never entered Landau’s mind! – for Landau the first the most natural way of data aggregation was: to count the amount of women ranked 1,2,3 and divide by the sample size. This is the genius! He is constantly keeping physical meaning in mind, in stark contrast to glorified celebrity PhDs!

Do you see the difference? He did not sum the names of the categories, he summed quantities of people, and divided them by the quantity of people – he produced a perfectly valid quantitative result.

So pay attention to any emergence of categorical variables in stats. Every time you detect a categorical variable pay attention to how it is plotted: does the plot require you to measure distances? If it does, spit in the face of the author, or hit him with something hefty, or fire him.

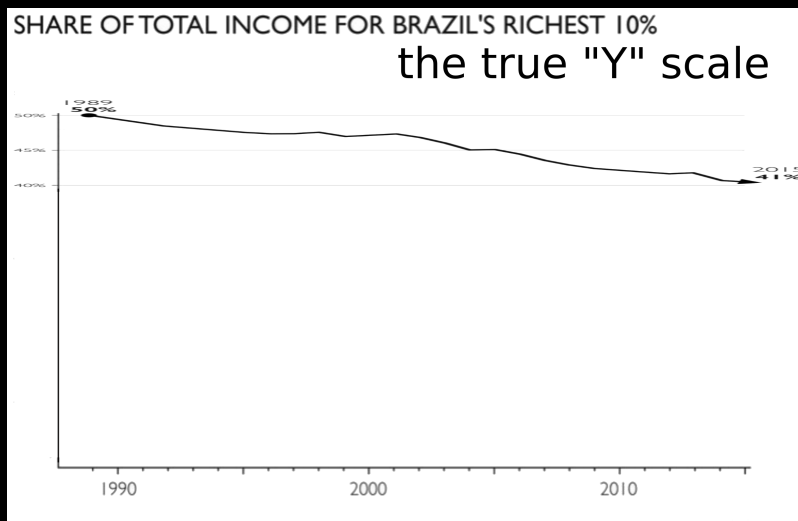
1.5 Meaningless Indicators

Immediately after criticizing people for using truncated “Y” axis, Rosling prints the following graph.



He truncates the “Y” axis so that the effect he wants to misrepresent is MAGNIFIED 4 TIMES, he even puts a decorative arrow on the graph! And comments: *...the number is disturbingly high. At the same time, it hasn't been this low for many years.* But we are

going to follow Rosling's advise, shall we? *First, let's change the scale on the vertical axis. Using the same numbers, we now get a very different impression.*



This is the real magnitude of the change, compare it to what Rosling printed. The visual effect is magnificent, the lying graph with this treacherous arrow at the end still seems impressive, even though we see the truthful graph. So that Rosling was right! This method of lying does work. It would be stupid of him not to use it, since he devoted an entire chapter to this method.

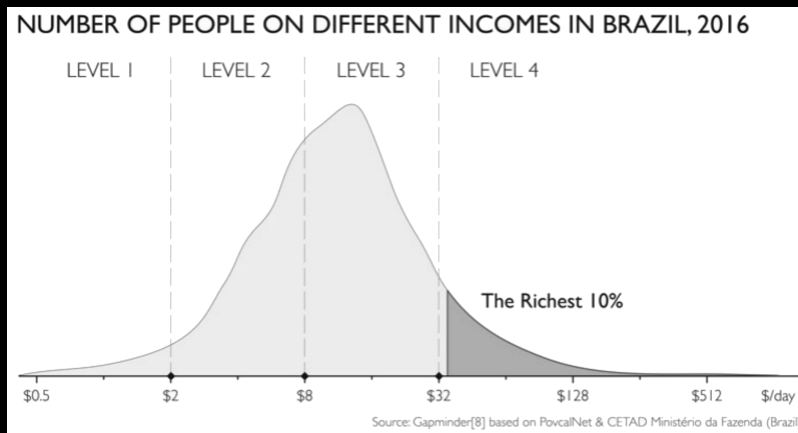
But the scale is not the only lie about this graph. Ask yourself, what does this indicator represent? *The share of total income received by the top 10% of the income earners* – what does it tell us about the economy? Is it implied that the economy is unfair when this indicator is 50%? Or is it implied that this 50% indicates poor quality of life of the 90% of the population? If something like that is implied, then what does this 9% change represent? How much the life or economy have improved when this indicator decreased to 41%? If so, then in what way did it improve? And what could have caused this 9% fall?

Inadvertently, Rosling helps us to find out if these questions have answers. In his own words: *We almost always get a more accurate picture by digging a little deeper and looking not just at the averages but at the spread*¹.

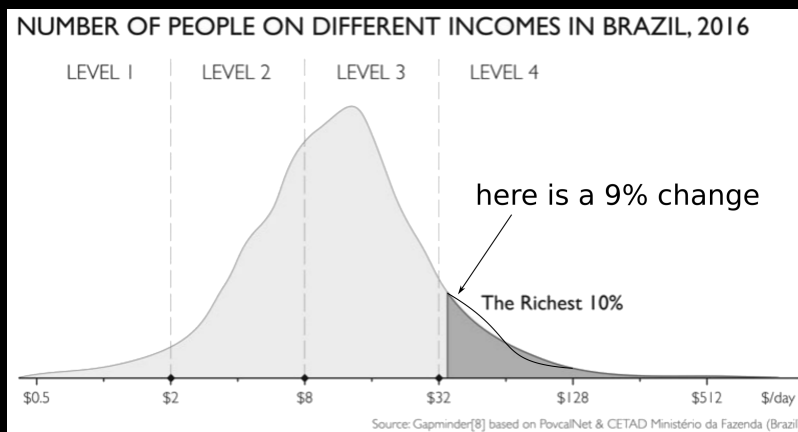
He prints another graph², the one that displays the income distribution, thus giving us more information about the mathematical meaning of the indicator in question.

¹by "spread" he always means distribution

²The income distribution graph quoted by Rosling (from *Gapminder*. "Income mountains-v3". November 2, 2017. gapm.io/incm) is highly questionable. The "X" axis is logarithmic, it may entail that the area under the distribution curve does not represent the sample size, however the underlying real income distribution could have been scaled logarithmically in the way the area corresponds to the number of people in a given income bracket. Indeed, I measured the areas, and the gray is very close to the 10%,



The gray area represents those 41% of national income owned by the 10% of the population. Can we imagine the change in question? How would it look on this graph – another 9% drop of the indicator? Should it necessitate a 9% shift of the mean value, or the mode of the distribution? Actually, not! We may accommodate the change in infinitely many ways! For example, see the following graph, I redistributed the income slightly, so that the richest 10% are now 9% less rich.



Do you see how it improves the life of poor Brazilian people? Compare the graphs. Can you honestly tell that one is in any sense “better” than the other?

On the other hand, how plausible is the change that I plotted? It is mathematically consistent, but can I explain it in real life terms? Yes. Perhaps, those poorest people among the richest 10% are dentists and their suppliers of materials. The plotted change represents a price rise for dentistry materials. A small portion of income

therefore we must assume that the area does represent the amount of people. In this case the *total income* is the multiple of the area to the income. I sliced the area and integrated back its multiple with income. The gray portion of income went way above 2/3! I calculated the lower sum, so the increase in accuracy could only emphasize the discrepancy. **This graph can not be true, because it does not correspond to the claimed value of 41%!** Fortunately, the veracity of this particular bell curve does not affect my argument. What I am demonstrating, could be demonstrated on any arbitrary bell curve, and my argument holds for any income distribution, be it real Brazilian situation or an abstract situation imagined by mistake.

was redistributed from dentists to suppliers of materials. DOES IT MAKE THE POOR HAPPIER?!

Could it be some other event or some global change? Of course it could! But it does not follow from the numbers presented so proudly by Rosling! **Nothing really follows from the original statement: *The richest 10% in Brazil earns 41 percent of the total income. The number dropped 9% since 1989.***

In other words infinitely many economical events with varying (read “opposite”) outcomes could cause a 9% change, which will be perceived as a number 9%, telling us nothing about the cause and this cause’s real life outcomes, which renders the indicator absolutely meaningless.

For honesty’s sake, this indicator could have some relation to wealth distribution, IF we actually look at the distributions! – not the wonderful charming graph with the arrow at the end. A comparison of two distributions (from 1989 and 2016) could reveal to us that the mean income raised, that the working people become richer and not that the rich people become poorer. But Rosling does not bother to compare actual distributions, because there is no suitable spot on a bell curve to place an arrow at.

1.6 Worse Than Meaningless

But there is more!¹

Rosling writes: *Take Brazil, one of the world’s most unequal countries. The richest 10 percent in Brazil earns 41 percent of the total income. Disturbing, right? It sounds too high. We quickly imagine an elite stealing resources from all the rest. The media support that impression with images of the very richest – often not the richest 10 percent but probably the richest 0.1 percent, the ultra-rich and their boats, horses, and huge mansions. Yes, the number is disturbingly high. At the same time, it hasn’t been this low for many years. Statistics are often used in dramatic ways for political purposes, but it’s important that they also help us navigate reality.*

Do you see what he has done here?

– *one of the world’s most unequal countries.*

A baseless assertion, Hans, you open the argument with the desired conclusion.

– *The richest 10 percent in Brazil earns 41 percent of the total income.*

¹This is supposed to be read in John Lennox’s voice.

OK, please explain what does this indicator mean.

– *Disturbing, right?*

Nope. The numbers you quote, Hans, are not disturbing, the depth of your lies is! We already figured that your numbers can not disturb anyone because they have no physical meaning, your numbers do not reflect any disturbing properties of reality, but the eagerness you wish us to be disturbed about this nonsense is seriously disturbing.

– *We quickly imagine an elite stealing resources from all the rest.*

Nope. You gave me absolutely no data to imagine that.

– *The media support that impression with images of the very richest 0.1 percent, their boats and huge mansions.*

A pinch of harmless self criticism to look more trustworthy (Being a “good cop”, Relative to those evil media, Hans?).

– *Yes, the number is disturbingly high.*

Pretend to be in an argument, while reiterating the pure emotional mantra, and conclude with pure chutzpah:

– *Statistics are often used in dramatic ways for political purposes, but it's important that they also help us navigate reality.*

What reality, Hans?! You are pushing CHEMICALLY PURE EMOTIONS like a crying girl!

This paragraph is dirty and manipulative through and through. But it would be a mistake to think that Rosling wanted you to sympathize with “the poor”. It certainly looks like that, on the surface, but this is an emotional trap of second order, he indeed wants you to emote strongly, but he does not care which side you would pick in the fictitious conflict he painted so vividly. Even if you expose his manipulation like we just did, he still succeeded in his major task. Pretending to be sympathetic to the poor, he wrapped you into an emotional spiderweb, and while you are either busy untangling his sticky lies or enjoying the embrace, **he smuggled into your head the idea that income is equal to wealth**. When you finish with this paragraph, whichever conclusion you make, you are doomed to accept the premise: *The richest 10 percent in Brazil earns 41 percent of the total income*. It does not matter what is the actual share of the income they steal from the poor poor. It does not even matter if you believed the entire sentiment of stolen income and raging inequality. The real message he seeds into your head is: **the rich earn income**.

Are you impressed how easily it fit into your brain? They “earn” what they have! You may now disagree with this formula, but the emotional connotation of “earn” is

already home. Isn't it impressive? I think it is impressive, but it is merely the dressing, because there is another layer of mendacity in these few words!

The word "income" itself is the most important inner core of this nesting deceit. All these layers of lies were crafted to deliver this trojan horse inside your head. Even if you unravel most of these lies (and they already feel too much), the rest of the argument proceeds with the unspoken assumption that income is wealth: *The income share of the richest 10 percent*. He equated wealth and income – this is an enormous lie – the real richest people do not have official income at all (or if they do, they do not notice it). All those the richest who are highly relevant to the picture of inequality and wealth distribution, the real parasites, who not only exploit people, but ruin the economy and social institutions – **the mafia, bureaucracy, banksters, police and military high command, Davos patrons – they are all excluded from the picture.** Excluded so silently and so completely!

Rosling evoked the "righteous" hatred for "the rich" in the reader's mind and channelized it in the direction that is way off the real rich who paid for his books.

But there is more!

Who are the richest 10%?

Brazil population is about 212 million. It means that the richest 10% are 21 million people. Rosling wants you to hate 21 million people, for them being richer than the rest. Twenty One Million. How many is that?

The Brazilian army is under 0.4 million. The entire Brazilian police is under 0.5 million. It seems impossible to find out the amount of bureaucrats in Brazil, let's be generous: 1 million. If we subtract these from 21 million¹, we still have 19 million people to hate! Who are those people?

According to the graph, they have income above \$33/day (very roughly). Those people are: civil engineers, electronic engineers, mechanical engineers, industrial designers, software developers, bookkeepers, dentists, physicians, teachers, even many nurses – those are "the richest ten percent" that Rosling wants you to hate. **Rosling wants you to hate literally A MAN NEXT DOOR!** And a productive member of the society instead of the richest 0.01% who are really giving meaning to the word "inequality"!

When speaking of "the richest ten percent" Rosling evokes a powerful image of *an elite stealing resources from all the rest* which is only applicable to the richest 0.01%

¹remember we can not subtract mafia and petty criminals because they do not have official income and thus are not included in this number

(who are not even present on the graph) – When was the last time a mechanical engineer stole resources from you?

According to Rosling: *We quickly imagine ... their boats, horses, and huge mansions.*
– Can you imagine every tenth man having a huge mansion or a boat? 21 million luxury boats, I remind you. Or perhaps, Rosling wants us to imagine huge mansions of surgical nurses...

1.7 Income Inequality

Take this equality indicator with the corresponding distribution. Let's assume for the sake of the argument that, after we have unraveled all these layers of lies, Rosling produced evidence that this indicator describes a meaningful property of the income distribution. At its present value of 41% Rosling considers: *...the number is disturbingly high.* Good. What number is not disturbingly high? It is not a rhetorical question!

In order to claim something to be high, let alone disturbingly high, you need an idea of normalcy, or at least an origin of coordinates. What is normal, healthy, ideal inequality for an economy? Could it be “disturbingly low”? What is the space of possible inequality? All of these questions are necessary for understanding the meaning of the inequality in question. Not single one of this questions disturbs Rosling. His goal is to incite emotions not to explain to you his indicators and what they actually mean.

Do you see already how meaningless the very idea of measuring inequality is? For the sake of the argument, let's assume you have a good adequate measure of inequality, set aside all the flaws described above. You can produce numbers, but do you have a space to place them into and compare? Can you tell what is high and what is low? What is better and what is worse? **How much equality would you like to have?**

Would you like to have a perfect income equality? Everyone has equal income. A dentist earns \$100/hour, a machinist earns \$100/hour, a toilet cleaner earns \$100/hour, an unemployed toilet cleaner earns \$100/hour, a machinist who refuses to work earns \$100/hour, a dentist who mangles your teeth earns \$100/hour, a career pickpocket earns \$100/hour, a serial killer earns \$100/hour, a newborn infant earns \$100/hour.

NO?! Are you advocating for inequality?!

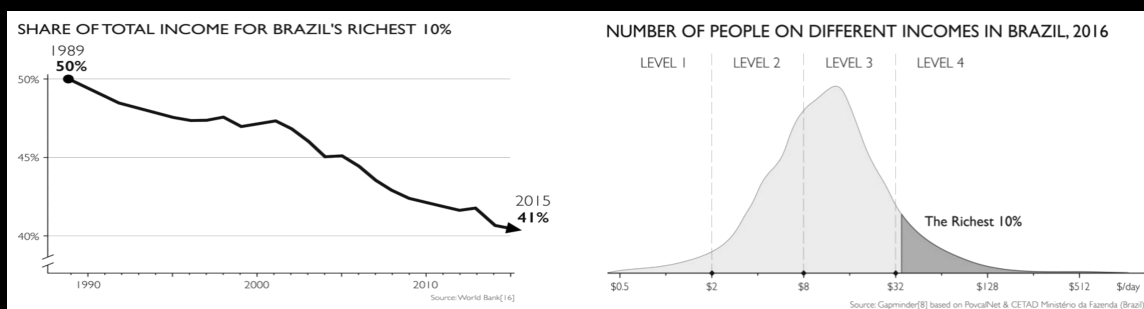
Do you now see how the philosophical idiocy of “equality” follows from its mathematical idiocy, or rather undefined-ness. You would now like to define *whose* income we are talking about. Right? But It won't be enough.

You should be resolved now to replace *income* with *income per unit value contributed into economy*¹, because (see above) a machinist who produces 100 lug-nuts per hour should earn more than a machinist who produces only 1 lug-nut per day. You now see that the *income* is an invalid measure.

Oh, look! It is invalid for the second time! The *income* is twice invalid and should not be considered as an indicator, like AT ALL!

1.8 Muh Equality

Have you lost count of how many lies are packed into the original message: *Take Brazil, one of the world's most unequal countries. The richest 10 percent in Brazil earns 41 percent of the total income. Disturbing, right?*



Let's recap:

“41%” is irrelevant, the “9% drop” does not show anything

“10%” is a wrong target,

“earn” is a lie

“income” is a lie twice (once it shows wrong people, twice it is unweighted)

“rich” is a misnomer

“too high” is hollow nonsense

“Disturbing” is an emotional trick

You see that it is possible for a sciency-looking graph to be meaningless in more than one way, and this one is THOROUGHLY meaningless – Rosling did a good job of removing every trace of possible meaning.

But there is more!

¹There should be a chapter about non-weighted indicators (see also “wage gap”) – a very prominent fallacy, not a big surprise it found its way into this case too.

Why should we bother about “equality” in the first place?! Not fairness! Not well being! Not justice! Not comfort! Not health! Not happiness! – Mr. Rosling wants us to value some abstract “equality” above any tangible quality of human life! By propounding this nonsense graph “*share of total income*” Rosling not only forces upon you seven insanely wrong ideas about human society and one detrimental destructive emotion but also **he messes with the very value system of yours.**

Not only he calls you to disregard meaningful economy indicators over a meaningless made-up number, not only he provides cover for the most evil fraction of the rich, not only he sows discontent and conflict where none is due, but he calls to “equalize” people! Are those people happy and healthy? Doesn’t matter! They are “unequal” – save them! Is the system unjust? Does it reward merit? Doesn’t matter! The rewards aren’t equal! – destroy the system!

It is only *disturbing* for Rosling that the people like you are not “equal”, but not why they aren’t, let alone the question of fairness. But I think the real idea he is pushing forward, **the idea of superior importance of total equality goes far beyond *income*.**

As we saw in the previous section the notion “income equality” is not defined, not bounded, this undefined-ness causes absurd equalization of income. But the most sacred notion of “equality” is not limited to income! Indeed it would be visibly too absurd to achieve total income equality without equalizing all other aspects of your life and your personality.

It is disturbing for Rosling and his Davos patrons that you little people work different jobs, earn different rewards, wear different cloth, eat different food, say different things, think different ideas. They want you all equal in all regards, in all aspects. And this is why they have taught you to crave “equality”. Quite successfully they have! The notion of “equality” is already sacred throughout the political discourse, for all factions and persuasions. It has become an unquestioned ideal.

Just like any other religious dogma or ideal, “equality” is completely undefined. But the lack of definition is never a disadvantage for an object of belief, on the contrary, all social beliefs, upon closer investigation, turn out to be very rapidly moving goalposts, the swifter they move the more followers they gain. Before your own eyes the idea of “equality” is including progressively more aspects of human life and social interactions. Every time one little thing is equalized, the equalizers move on to another. In retrospect people were sure that “equality” is only about civil rights – turned out that they were wrong – today’s “equality” is about giving additional SAT points to women to compensate for their poor performance in maths¹. Every time someone fails at something, they immediately demand “equality”, and there is no visible limit for that. Proceeding its way, the real equality leads to thoroughly mixed very fine

minced meat – only then we could legitimately claim that we successfully overcame differences. The notion of “equality” defies biology, chemistry, and physics.

The topic of equality is exhaustively covered by Kurt Vonnegut in “Harrison Bergeron” – this is absolute must read – I can not relay this prophetic gospel in my own words without embarrassing myself. Feel free to divert to Vonnegut right now, I can wait.

And note, Rosling does not want to equalize you with his patron Bill Gates (as we discovered above, this fraction of the rich is not present in the picture at all), he wants to equalize you with Brazilian shoe shiners.

1.9 Fancy Arrangements

Having successfully dealt with dirty philosophy, let’s go back to pseudo-statistics in its mathematical aspect. This time it is not Rosling but a lesser liar Paul Frairie¹

Paul Frairie writes: *At least 187 days this year are the anniversary of a school shooting in the US that resulted in one death or more.* And supplies the following picture:

¹This practice is called “adversity score”. SAT has been recently updated with several rules to add certain amounts of score points for free to females and non-white people, depending on how poorly these groups perform at SAT on average, the worse your expected performance is, the more score points is added for free.

¹Paul Frairie – a Canadian self professed “Political science instructor” of unknown degree of influence on your life. A lefty gun-grabber. His twitter account: @paulisci – if you wish to know more about the pawn.

January-2019 29 30 31 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 1 2 3 4 5 6 7 8 S S M T W T F	February-2019 26 27 28 29 30 31 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 1 2 3 4 5 6 7 8 S S M T W T F	March-2019 23 24 25 26 27 28 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 1 2 3 4 5 S S M T W T F	April-2019 30 31 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 1 2 3 4 5 6 7 8 9 10 S S M T W T F
May-2019 27 28 29 30 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 1 2 3 4 5 6 7 S S M T W T F	June-2019 25 26 27 28 29 30 31 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 1 2 3 4 5 S S M T W T F	July-2019 29 30 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 1 2 3 4 5 6 7 8 9 S S M T W T F	August-2019 27 28 29 30 31 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 1 2 3 4 5 6 S S M T W T F
September-2019 31 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 1 2 3 4 5 6 7 8 9 10 11 S S M T W T F	October-2019 28 29 30 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 1 2 3 4 5 6 7 8 S S M T W T F	November-2019 26 27 28 29 30 31 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 1 2 3 4 5 6 S S M T W T F	December-2019 30 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 1 2 3 4 5 6 7 8 9 10 S S M T W T F

This is so absurd on so many levels, I don't even know where to start! For example we can have a completely red calendar by killing just one child a day. For the cost of 365 children the picture will become as scary as the following:

January-2019 29 30 31 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 1 2 3 4 5 6 7 8 S S M T W T F	February-2019 26 27 28 29 30 31 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 1 2 3 4 5 6 7 8 S S M T W T F	March-2019 23 24 25 26 27 28 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 1 2 3 4 5 S S M T W T F	April-2019 30 31 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 1 2 3 4 5 6 7 8 9 10 S S M T W T F
May-2019 27 28 29 30 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 1 2 3 4 5 6 7 S S M T W T F	June-2019 25 26 27 28 29 30 31 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 1 2 3 4 5 S S M T W T F	July-2019 29 30 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 1 2 3 4 5 6 7 8 9 S S M T W T F	August-2019 27 28 29 30 31 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 1 2 3 4 5 6 S S M T W T F
September-2019 31 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 1 2 3 4 5 6 7 8 9 10 11 S S M T W T F	October-2019 28 29 30 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 1 2 3 4 5 6 7 8 S S M T W T F	November-2019 26 27 28 29 30 31 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 1 2 3 4 5 6 S S M T W T F	December-2019 30 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 1 2 3 4 5 6 7 8 9 10 S S M T W T F

WHOOOO! SCARY!!! All days red!

But a very similar "all red" calendar can be produced by counting men killed by a lightning strike (just a few winter days might be empty) – are you now afraid of thunderstorms? Or if you wish, we can take an even more rare event, say a meteor kill – if you retrospect the history sufficiently far in the past, something inevitably

happened on each day of the year.

And this “all red” calendar reveals the weakest point of this pseudo-statistics: once we fill all the days with children blood this picture won’t update ever, no matter how many more deaths occur. It becomes absolutely transparent that this picture is completely uninformative – and since we have not altered the algorithm of the filling this picture, it means it was completely uninformative from the very start.

For example we would sacrifice 10000 children to Quetzalcoatl every year on January 15. We would slowly saw their limbs off, then skin them alive, and force their parents to eat their liver, then smear our calendar with their blood. As long as we do it only one day annually, The Paul Frairie’s calendar will show us a happy peaceful picture:

January-2019	February-2019	March-2019	April-2019
29 30 31 1 2 3 4	26 27 28 29 30 31 1	23 24 25 26 27 28 1	30 31 1 2 3 4 5
5 6 7 8 9 10 11	2 3 4 5 6 7 8	2 3 4 5 6 7 8	6 7 8 9 10 11 12
12 13 14 15 16 17 18	9 10 11 12 13 14 15	9 10 11 12 13 14 15	13 14 15 16 17 18 19
19 20 21 22 23 24 25	16 17 18 19 20 21 22	16 17 18 19 20 21 22	20 21 22 23 24 25 26
26 27 28 29 30 31 1	23 24 25 26 27 28 1	23 24 25 26 27 28 29	27 28 29 30 1 2 3
2 3 4 5 6 7 8	2 3 4 5 6 7 8	30 31 1 2 3 4 5	4 5 6 7 8 9 10
S S M T W T F	S S M T W T F	S S M T W T F	S S M T W T F
May-2019	June-2019	July-2019	August-2019
27 28 29 30 1 2 3	25 26 27 28 29 30 31	29 30 1 2 3 4 5	27 28 29 30 31 1 2
4 5 6 7 8 9 10	1 2 3 4 5 6 7	6 7 8 9 10 11 12	3 4 5 6 7 8 9
11 12 13 14 15 16 17	8 9 10 11 12 13 14	13 14 15 16 17 18 19	10 11 12 13 14 15 16
18 19 20 21 22 23 24	15 16 17 18 19 20 21	20 21 22 23 24 25 26	17 18 19 20 21 22 23
25 26 27 28 29 30 31	22 23 24 25 26 27 28	27 28 29 30 31 1 2	24 25 26 27 28 29 30
1 2 3 4 5 6 7	29 30 1 2 3 4 5	3 4 5 6 7 8 9	31 1 2 3 4 5 6
S S M T W T F	S S M T W T F	S S M T W T F	S S M T W T F
September-2019	October-2019	November-2019	December-2019
31 1 2 3 4 5 6	28 29 30 1 2 3 4	26 27 28 29 30 31 1	30 1 2 3 4 5 6
7 8 9 10 11 12 13	5 6 7 8 9 10 11	2 3 4 5 6 7 8	7 8 9 10 11 12 13
14 15 16 17 18 19 20	12 13 14 15 16 17 18	9 10 11 12 13 14 15	14 15 16 17 18 19 20
21 22 23 24 25 26 27	19 20 21 22 23 24 25	16 17 18 19 20 21 22	21 22 23 24 25 26 27
28 29 30 1 2 3 4	26 27 28 29 30 31 1	23 24 25 26 27 28 29	28 29 30 31 1 2 3
5 6 7 8 9 10 11	2 3 4 5 6 7 8	30 1 2 3 4 5 6	4 5 6 7 8 9 10

Still the best illustration of the absurdity of this calendar masturbation is February 29. On February 29, 1996 Mark Boyd and Malik Nettles murdered Kyunia Taylor as she was riding a school bus in St. Louis, Missouri. On February 29, 2000 Dedrick Owens fatally shot his classmate Kayla Rolland at Buell Elementary School, Flint Michigan. What an irony Paul! What a sweet irony! How could you forgot these innocent victims! You LITERALLY ERASED THE POOR KIDS from your history, Paul! You are a nazi! you are literally Hitler!!!

¹The very first section of the book is called *Why I Love The Circus* (the irony is totally lost on some people).

Bibliography

- [1] *Score Structure – SAT Suite of Assessments*, The College Board,
<https://collegereadiness.collegeboard.org/about/scores/structure>