

# Optimizing Between Extreme Distributions - Social Justice

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## Introduction

**I was wondering about the normal distribution. I think it is an extreme - - what is at the other end of the continuum?**

## Framework

Nations, Law, Judiciary

## Population

Nation states. Individuals within Nations, Groups.

## Questions

1. What is logic?
2. What other types of thinking are there and why?

## Initial Conditions

Groups, Nations, Law, Courts, Women, Men

## Self reference

All my models so far.

## Initial Thoughts

Critical thinking – structured approaches – deliberately and consciously framed allow not only the testing of the hypothesis but the testing of the frames. The historical development and usage of comprehensive and cohesive frames IS progress.

Narratives can help explore frames. But what is this narrative force? Could it be a series of questions and answers - and somehow connected in a specific cohesive way? Around each individual? So a flow of questions and answers are all centered on individuals but when they are brought together do they mean something?

Can the flow of narrative be connected to structure?

## Background

During my work so far I have explored many statistical models, math, philosophy, questions, history and stories. I have identified the **certaintists** – the extremists – which **seem to need to have** absolute certainty. They develop ideal models and then take brutal action on the rest of humanity to assert their utopian certainty. These are call tyrants, fascists, authoritarians, feminists, socialists, communists – they go by many names throughout history. <https://humanistman.com/wp-content/uploads/2019/07/Absolute-Certainty.pdf> , <https://humanistman.com/wp-content/uploads/2019/12/One-Thing-I-Know.pdf>

The questions arising are from trying to find the extremes on the continuum and trying to identify the things in between the extremes and how they may be described. It's a general technique of **exploring the continuum** – which I have declared existing by my hypothetical infinite number plane in two directions zero to minus infinity and zero to plus infinity and I am the zero in the middle.

<https://humanistman.com/wp-content/uploads/2020/05/Questioning-Numbers.pdf>

So at the other end of the certaintists continuum are the **uncertaintists** – these have been called libertarians, anarchists, individualists, free choice, etc. Somewhere in the middle between these

extremes successful colonies – groups – tend to survive. Daniel Dennett exposes this in his insights about the eukaryote expansion (which I call cooperation – he calls “*The first great technology transfer*”) *Daniel Dennett: Keyword(Philosophy Science)* <http://ase.tufts.edu/cogstud/dennett/> and humans, evolution, intelligence and many other topics. Any of his books and talks are worth investigation – I rate his work highly. <https://www.youtube.com/watch?v=IZefk4gzQt4> *Daniel Dennett: "From Bacteria to Bach and Back: The Evolution of Minds" | Talks at Google.*

So while exploring things I began to notice some patterns – questions that no-one had answered yet, patterns that no-one understood yet, the absence of questioning and the repression of thought.

This got me thinking.

## Interesting Patterns

I was looking at groups – all of humanity – so the philosophical models emerged into patterns, categories – how to categorize, models – statistics and fairy tales, poems, art and so on.

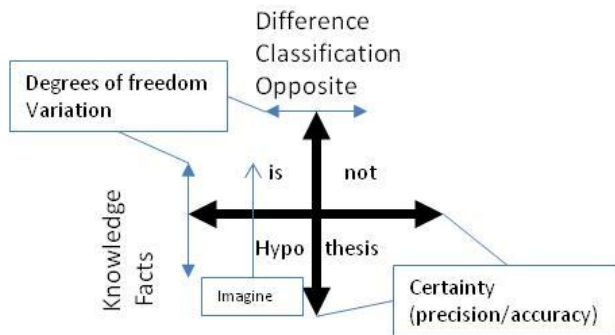
Two models which seem to have eluded much understanding were the Normal Gaussian model and the central limit theorem and the Benford series.

I have just discovered Bob Doyle’s work and am impressed. There is support for the idea of the hypothesis space and also the ability to delve into the chaos of uncertainty, complexity, probability, zero and infinity – which I put in the top left box of a four box model – and the questioning, exploring hypothesis, and the questions, action hypothesis space – which then leads to the new “is” (Einstein’s mass) space in the top right box. So the hypothesis spaces are below with the questions box and the action hypothesis box and above the line are the chaos/universe box (our constant certain uncertainty) and the top left corner and the mass of certainty – what we build and construct - in the top right box as well. My confirmation bias is working overtime because a) he seems to have done a lot of work b) much of it seems to support my ideas c) he has worked with Dan Dennett d) He is multi talented f) I would tend rate him highly in Corruption (he is not), Coherent, Comprehensive, Hypothesis, Certainty, Exploration <https://humanistman.com/wp-content/uploads/2020/06/Evaluating-Humanity.pdf> .

My main problem is that I cannot assess all of this work or understand all the math of his work – I do not have the knowledge or skills to test every statement he has made. This applies to everything I and worked on so far. I cannot agree or disagree with any confidence – I can only explore his work and use ideas myself to see where it takes me. This **is probably enough** – I don’t have to find out where we disagree or I think he has made a mistake. I can examine his work, his ideas, and the way he went about it and use what I can to form my own views. If he seems - on a pareto basis – mostly “right” – then maybe that puts him in the top 20% of all humans? This applies to all the work I look at – if it is authentic and flawed then its human.

## Forcing the Issue and Power Laws

I like the four box model – it allows two binary extremes to be explored together – and then we argue about definitions and where the lines are positioned. To me it seems like a general way to help break out of binary thinking and get into that “third” dimension. I like that I explained equality and diversity just using 2 axis (essentially an uncertainly bounded 4 box model). This idea of putting up two continuums together in different alignment gives us the 4 box model. I like that I was able to map Einstein’s equation to the 4 box model and takes his c squared function and plant it in the top left corner to represent a constant uncertainty – the most certain thing we know – the limits, the chaos, the uncertainty, the complexity, the probability – all in the one box – and then the question becomes what are the Euler steps away from the box. In my mind the **Declarative** spaces are the top two boxes – the same/different – is/is not – true/false – the things of matter and definition – with a boundary layer separating extremes. The bottom two boxes are the hypothesis layer – the act of questions and then the answering – the exploration Acts– questions/answers – the hypothesis. And here we go trying to force that x and y axis through these things so that we can talk in equivalence terms between a declarative or Structured space and an exploration discoverer, journey – or a narrative space. Why else do we have a left and right side of our brains – why else do we have these main differences in how we have evolved?



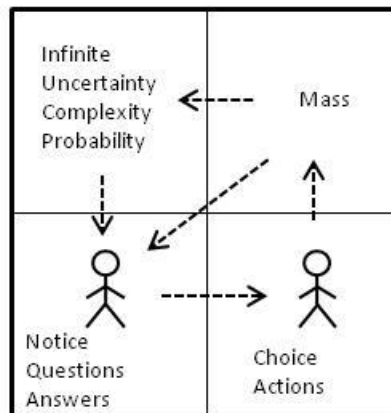
THING ----- THING  
 is ----- Not  
 Same ----- Different  
 Group ----- Opposite

$$E = M * C^2$$

$$\frac{E}{E} = \frac{C^2}{E} * \frac{M}{E}$$

Known  
 Certain  
 Choice

unknown  
 Uncertain  
 Hypothesis



What does division mean? What does E divided by E mean? What Does Jon Divided by Jon mean?

Does Equal mean same? What does Multiply mean? Do Multiply, Divide and Power Law all mean the same thing? Are they the same functions?

Notice from the above 4 boxes if I fail to notice the top left box – the constant uncertainty – I could get stuck in a loop just looking at Mass all the time – “tending my own garden” without looking at the universe around me.

By default we call a thing divided by itself ONE or 1 and name it the identity function. A bit like our bold declarative **IS**. Our initial self reference.

I get confused by the number (count) of representations for the same things in mathematics. We know that the power law function is a general function to put a superscript number above the number and it means to do something to that number. Two numbers in a relationship of some kind. It is a command/instruction to move around the two directional infinite number line. Then why develop log and natural log and square root notation as well?? – doesn't that just confuse things?? – I mean they all mean the same thing so why not just use one instead of navigating the hierarchy of math language where every person names a new function after themselves?? I mean it is all a little self indulgent.

So a power law - where there is a POSITIVE NUMBER means – do the same thing you just did the number of times of the power – so it is really a multiplication kind of thing or more generally **multiplication is a power law kind of thing**. – An instruction to dance on the infinite number line a certain way. The positive power instructs you to travel further away in one direction and then tell me where you end up on our standard infinite number line when you get there. You are already at a **YOUR NUMBER** – go back to ZERO - **START FROM ZERO AND THEN** move along the number line the same distance that **YOUR NUMBER REPRESENTS** for the first step, and then for POWER TIMES (minus 1 because you have done the first step) take each next step and wherever you end up then **MOVE THE SAME NEW DISTANCE AGAIN** and answer the question **WHERE DID YOU END UP?** (you can see by this instruction I get in trouble with standard maths because we get lost between the signs. I think the -5 to the power 2 to means take minus 5 minus 5 steps – to mean end up at minus 25 or -5 to the power -2?). The reason I suggest this idea is because at some base level there is only two directions – which we call Plus or Minus.

A negative power instructs a kind of division thing – it is 1 divided by the number to the positive power. So it is one **divided by multiplication**. It uses the Multiplication power law but in a different way. So it's a kind of self reference thing of identity i.e. 1. The **negative power law asks a different question** – it poses the question – well I want you to **END UP at ONE** and YOU WERE LIMITED TO DANCE STEPS (Movement along the number line) that **YOUR NUMBER REPRESENTS** and answer the question **WHERE DID YOU START FROM?** on our infinite number line?

So then we have the logarithmic question. This is asking about the Power law as well but its poses the question - Well Here You are **AT YOUR NUMBER – HOW MANY STEPS?** using our “interval base” of 10 do you need to take **to get here?** How many Dance steps did you take to get here using our dance

routines? The Dance routine is the opposite of the Positive Number Power law dance and its is a problem to solve this kind of dance because you have to work backwards – much more work is required to solve this Log type problem. Lots of dancing.

Other dance routines Modulo arithmetic, Floor ,Truncate and prime. Taking fixed length steps without passing a certain limit and then giving different answers – where did you end up, how many whole steps, what is remaining, take all possible whole steps and leave no remainder – tell me how many steps you had to take, etc.

So Euler's numbers is an infinite series sum of multiple negative power law instructions using positive integer starting positions. Then we add a special Logarithm for Euler's number LN. Can't we just use the same language?

So we cheat a little with the power law **initial self reference** by calling everything to the power of ZERO = ONE. So one becomes our observed starting point.

So then we have the fractional powers. The problem here is that standard maths throws up new terminology here – ROOTS. So if we take a power of 1 DIVIDED by 2 i.e.  $\frac{1}{2}$  then this means SQUARE ROOT. This poses the instructions - **WE WANT YOU TO END UP WHERE YOU ARE NOW. START FROM ZERO AND THEN** tell us **what steps you took to get there? It is a power law thing once again but root notation is used instead – and then you create imaginary numbers and questions that give two answers!**

All these dance routines are getting complicated – some send you on a fixed journey – others ask how you got here or how can you get from here to there or from there to here. Many of them ask you to remember more things along the way – and even remember dance routines within dance routines.

## Reasons, Explanations and Motivations – Social Justice Warriors

I am concerned that the certaintists want the world to look like it OUGHT to look – as if there is some certain utopia – the grand scheme to the glory of their certainty.

I am concerned the virtue signalers want to “DO GOOD” - to some aim of VIRTUE and Goodness which comes from being in groups and noticing others. What does the “best” group look like? Can't these people just do their job at least – why do they have go around doing good to others - *here let me give you another book of great wisdom and sight – it is all you need to know and discover – all has been explored.*

It is not Equality - for that is insane but so often idiotologists GRAB THAT CERTAIN FLAG making sure the stomp all over any “others” who dare to question or have a different hypothesis to the in-group mob. **“Everything should/ought look like this as I describe it and according to my measures.”**

It is not Laissez-faire, libertarianism or extreme individualism – because the group has to be bound by something. I call it Telos – and shared schemas of some kind – some shared interactions – some shared relationships.

It is not social design by white coated experts, magi, witches, demi-gods, experts, analysts, thinkers, virtuous – because life is real and there are tendencies – bounds, limits, constraints, difficulties.

But if I display any more – does that mean some mad certaintists will take it and inflict it like a nuclear bomb on the rest of humanity? Too much can be dangerous in the hands of certain, mad, power hungry fools?

I cannot guarantee that a law, system, founding document, learning, education, public service – will ever be immune from idiots and their various idiotology. I can help my children understand – I can even try to understand myself – but what if there is no-one left? - I cannot see many left now – they all seem to have gone and are being attacked by the mob, shut down, censored by the ignorant, outraged, babies - the tantrums – must I rely on hope and randomness that messages will some how pass down through time to be explored by others?

<https://humanistman.com/home/frames/meta-frames/> 9. Equality and Diversity

<https://humanistman.com/home/frames/humanism-frames/> 11 Humanism – Choice – Distributions, Version 1, date 24/04/2019

## **Benford and Central limit Theorem - Binomial Distribution – Things and Waves – Choice - Extremes**

If we imagine a thing – the first thing – it is an apple.

The apple - having declared itself to be an apple - eventually notices some thing else – it is an orange. They are the same and differentiated because one is an apple and one is an orange – but they both exist in the same universe and can be described using similar characteristics – of same/different things - because now we have discovered differentiation we can differentiate many things that we notice – like colour, size, shape, taste, longevity, etc. If we treat every new object thing that we notice (as opposed to characteristic thing) then all objects are different and they get their own names. But if we GROUP LIKE things together – like Apples and Oranges then we get two groups of things with lots of characteristics we can explore and MEASURE.

If we are going to measure things we need a yardstick – I know – let us use a thing called number. It's a count of things – like counting apples belonging to groups – and it is infinite.

When we look at all the possible infinity of apples and oranges on any similar characteristic thing – measured by the same yardstick – we **CAN** get a binomial distribution.

Just like two dice – imagine two dice. Dice one has infinite faces representing infinite numbers. Dice two (Which is different to dice one – which is why we call it dice two) has infinite faces – just like dice one – because they are both in the same universe. If you throw them up in the air OR allow them to move around and choose their own face to display at any one time – you find after infinite choices and throwing up you **CAN** get a binomial distribution.

The yardstick is the number plane – and it is in a certain specified order usually from 0 to + infinity – but it could be negative infinity as well – it is just a matter of how you define the process of describing the result of examining the two die's faces.

So the issue here is that the mathematics tend to view the  $a, b$  of the equation as variables measuring characteristics of things – not things themselves. They have already generalized the characteristics of the thing being measured to  $a, b$ , and thus obscured the relationship to the thing itself – the apple.  $a, b$  just represent the infinite list of things which can be measured for a grouped object.

**MANY** possible measurements of all possible things (objects - declared via "IS" – apples, oranges and grouped via like) **using the same declared yardstick** (the infinite number plane) result in the binomial distribution – which is related to process repeating themselves, infinity, and Euler's number and Euler's identity.

I am deliberately equating infinite dice with every other types of object measurement – and thus the two objects **CAN** look like a binomial distribution when measured by the same yardstick about anything.

This distribution tendency questions the idea of choice, free will, randomness, fatalism and determinist universes - all emerging from choices of each individual apple and orange in the group. Which is why Daniel Dennett and Bob Doyle's papers are interesting.

So these are **very strong tendencies** which indicate that regardless of individual choices – averages over infinite time and dimensions **maybe approach a certain formula**. **The key here** is that we can never get to infinity – so **choice still remains, free will still exists**. This **certainty – assuming infinity is here and now** – appears in many models in life.

***One thing I know with absolute certainty is absolute certainty does not exist.***

I am just going to look at the Normal distribution – the bell curve and **assume that it is a strong tendency**. I cannot follow all the workings of all the related distributions because they are off and running in the domain of formulas and math whereas I am trying to find some simple ground in the basic concepts and issues.

We know this a real thing - we see it all the time. When I was at school we used to line up and march into school with music. We would group, arrange and order ourselves in lines as different exercises. These good habits helped re-enforce counting, differentiation, order, and grouping concepts. We also saw changes over time as people's heights changed with age. We saw each other as equal and different in many different ways.

If we arrange all humans by height intervals on the number plane (measurement by precisions and accuracy) – those less than 150cm in this line, those taller than that but less than 160 – and we make the interval 10 cm each time – we see the normal distribution arranged by the length of the lines. Looking from above we see the shape – the x axis we defined as height intervals and the y axis is the count of humans in each <https://www.usablestats.com/lessons/normal> . We know this a **real thing** - it is



not simply because I made up kind of number plane – a fixed infinite number plane of two directions. Real Darwinian choices trend to this distribution.



I then turned the normal distribution to a cumulative distribution. This seemed like the tendency view of the all the measurement distributions. I explained this model by saying that the y axis is 100% and that the x axis is the ranked PROGRESSIVE measurement of characteristics from low to high – for every possible characteristic. i.e. infinity. So a very large percentage of people are AT LEAST 1 cm tall, the next movement along the x axis is that a large percentage are greater than 2 cm tall (a kinds of answering the question thing – a filter – at least) and so on until somewhere around the middle – the numbers fall and at the middle 50% of the people are at least that height and 50% of people are not. This then applies for all things – where the central point is the mean. It does not matter what the absolute of the mean is – it always changes as we move along – it is that all means are centered as zero. In the Middle.

So what does Benford mean (pun)? What is Benford telling us?

We know that both Benford and Central Limit work using the power law function – the idea of repeating something but they seem to be in two directions – one is upwards and increasing and one is downwards – the log function and decreasing. They seem to be two sides of the same continuum. Can power laws being explained on a continuum i.e. where the exponent is positive and negative integers? Is this what the digamma is?

I revisit the infinite line - it has two directions between hypothetical – and + infinity.

The observer is at zero looking in two directions and instructions can be given.

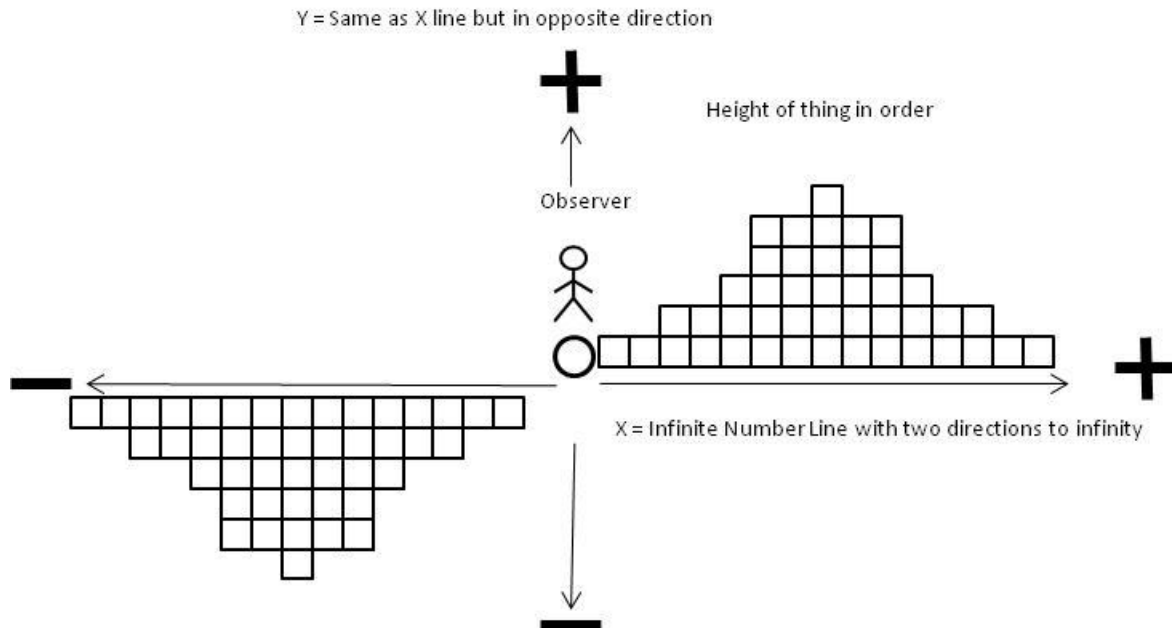
Imagine I am at zero (the observer) I ask all my school classmates to line up on the number plane where the number best represents their height in centimeters. I notice, as they line up, that the lines get longer. The length of these lines can also be represented by the same counting trick I used for the x axis in height. The count of humans is represented on the y axis (the length of lines) using the same number plane values and symbols I used for height.

So now I face the opposite direction – because direction in two dimensions already exists and by grouping and sorting people we know they can more in two directions one is away from the in the order and one is towards me in the order. So I could call moving away from me + and moving towards me minus – but I don't! I somehow decide to standardize the number line so that the movement towards me – the observer from one direction (the plus side) is called subtraction and the moving away from me

in the other direction (the minus side) is called subtraction as well. This confuses things a bit – because I am the observer after all. So we have two different meanings for the same movement!

I don't know why it is like that – it's a kind of observer/observee thing.

If I tell my class mates to line up on the minus side I could call their heights minus cm heights and I could call their counts in the line minus people counts – I could say there is minus one person at minus 150 cm height and that we explain exactly where they were on the number line relative to me – which we have already shown has two directions from the observer.



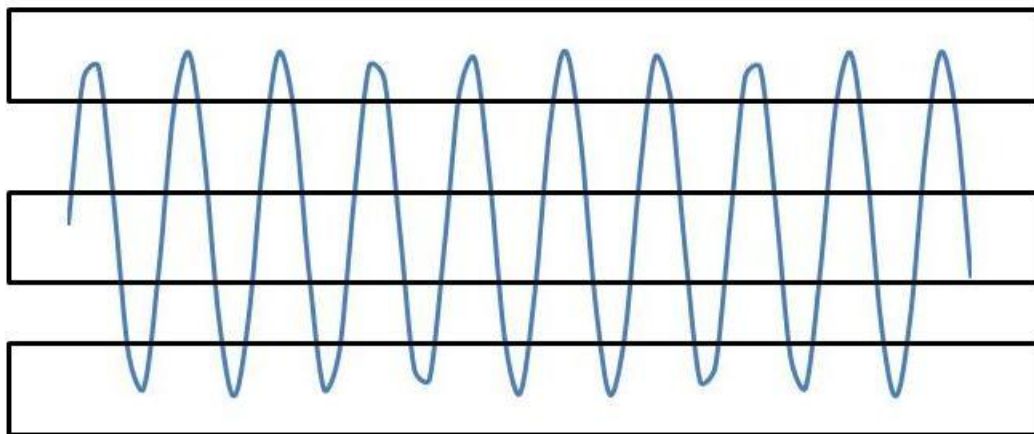
So instead of being consistent – even with in my x number line – relative to the zero observer I have confused direction and then put my x axis as a y axis and used it again as to count the objects.

Lets imagine my girlfriend is in one of the lines – she at the minus 3 position on the minus 150 cm line. I shout out “hello” – she replies “Hello – do you want to come and be with me?” , “Of course”, I reply . Do we stay in lines? How do I get there is it a one or two step? Sin?Cos?Tan? What about if some other person starts ordering us around for different lines and count off – just like in school. Didn't you hate being separated from the ones you loved just because teachers- those who issued orders – wanted you to line up in different ways and count off and be described, measured, counted and compared. Why can't my girlfriend and I just be who we are? I don't care what imaginary lines and groups people declare – none of these things described me or my girlfriend.

- Can I have minus six humans?
- Can I have minus six apples?
- Can I have minus six bank account dollar notes?
- Can I have minus six humans who are minus 100 cm tall?
- Can I have minus six bank account notes which are worth minus 1000 dollars each?

Triangles, Pythagoras, circles and pi are all enough to describe a sine wave - which looks just like that – passing through various defined axis in infinite ways. Start and zero and take a step forwards and backwards and you get the infinite number line but then just add the same infinite number line in the opposite way (outwards from the line – escaping the number line)

Sin and Cos waves are just the object rotating around an observer 1 unit away in a infinite number plane of infinite x axis (which we give different names to each one but in relative they are all the same thing just infinitely repeated) – the distance covered by the object for each complete rotation is related to pi. The difference in sin and cos are just the choices of the direction changes – relative to the observer. i.e. **there are only two directions from the observer's point of view.**



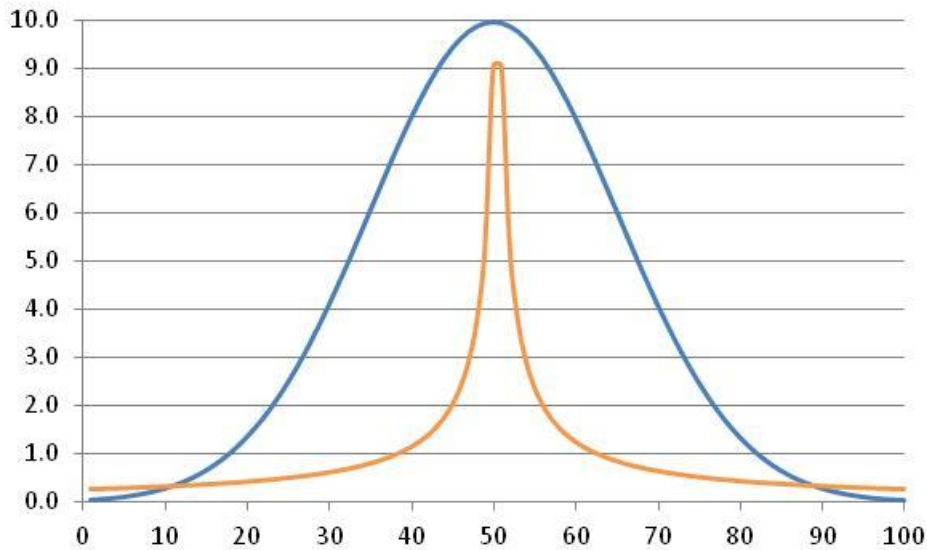
So If I was watching a rotating thing from my point of reference I might have a limited frame – I might be constrained to only understand some part of what I am noticing. But if the same thing repeats over time I might start to notice it. And then when it appears as the same shaped thing and PERSISTS I might remember it. I might think it's a THING and give it a name. I might see this thing come in my room through one door and leave through another door. Eventually I might stop noticing the doors and just see the thing itself. Maybe I see it come in one door and go out another door but then soon after a thing comes in another door and goes another door. I might think these are two different things or I might see the second thing as a consequence of the first thing. I might think it is a consequential different thing. Then I might think it is actually the same thing coming in a different way from some kind of journey I cannot see. I might develop concepts about patterns, waves, tension, harmonics, frequencies, resonance, cycles, oscillations, change and calculus.

Then I might control this thing – I might be able to take this thing and put it through a double slit experiment and then it interferes and tells me it is a wave. So the thing I think is a thing is telling me it's a wave. I can't see all of it. I think of it as a thing. *See Fourier transformations.*

If I fit two opposite Benford series inside a normal distribution we see that the universal observer is seen at the high/extreme point in graph – the halfway mark. We **can** call the middle point – zero – the most common, the most likely, the most massive, the peak, etc. We can then think that the normal path (in every sense of the word) is predicted by the blue line – choices, probabilities, Darwinian development – i.e. it represents survivability OF A GROUP where some choose to do things just a little different from the average – from what everyone else does. We then get the Benford series which has entertained many people for many years. It just seems to represent the results of real world choices – **that we observe closely and can easily see**. I hypothesize it MAY have something to do with the **hypothesis of choice** (question/answers/exploration) and the **hypothesis of action** and displays the kind of **energy** steps needed to do that work. A lot of very clever people have explored this series <http://www.benfordonline.net/> and discovered many things without making it clear enough for many other humans to appreciate. Once again I highlight – **it is only a model** and just a **certain tendency to infinity** – **but we are not at infinity yet**.

So maybe each step away from the normal requires an amount of effort to explore and produce something – each step is harder to take and that by trying to get further out much more energy is required. Maybe Benford represents the FAT, DUMB and LAZY complacency compared to the rich DIVERSITY and survivability of the normal curve? The Easy choice compared to the choices we need/should/ought to make to survive? Maybe Benford is like the unexamined life? In math terms we see the SAME power law on display but the positive power law gives us the SINE/COS like/Newtonian/Normal curve and the negative power law gives us the Benford type log series. Maybe the power law in a positive direction is at one extreme and the power law in the negative direction tends to the other extreme? **A kind of tension between the directions?** Newton observed “*for every action there is an opposite and equal reaction*” – is this the constant tensions between two, direction choices, the continuums, etc? What about strange attractors and chaos theory? The extremes of the curves themselves represent a kind of DECAY [https://en.wikipedia.org/wiki/Radioactive\\_decay](https://en.wikipedia.org/wiki/Radioactive_decay) (log, Poisson, Weibull) – perhaps – a change or twist in the curve (hyperbolic?) to allow for probability and more extreme choices to fit somewhere? Maybe large deviations theory, entropy, noise, Shannon-Hartley theorem, De Moivre, etc. Maybe this fuzziness is the central limit theorem recursing on itself the further it gets away from the mean? Maybe it's the observer effect and uncertainty principle as well. Those things that are further from the mean are less easily observed, measured and described and if we do we change what they are? Don't question a genius just in case you influence their choices? Don't interrupt playing children because they are discovering things we have forgotten and never knew? Maybe it is for all those experimental choices that push at the boundary limits and constraints at the strong opposing tendencies? Pushing the boundaries? Exploring the limits?

I don't know.



## What is the Opposite? – What is the other end of the continuum?

Whenever we find some concept there must be something we can relate it to – something different and not the same, something opposite. What is the opposite of the central limit theorem? It seems like the circle, sin/cos/pi functions are well embedded in many things. It also seems like the power law is embedded – the kind of repeating function thing – thing repeating itself. Nothing is absolutely a normal curve (positive power law) – that is the extreme. Nor is anything absolutely a Benford log (negative power law) type curve. Yet many things look like these things. What is the difference between something that looks like Benford and something which looks Normal? What is the difference between a positive power law curve and a negative power law curve? This is explored by many mathematicians with calculus – integration and differentiation with multiple variables and sometimes constants. When we see a graph – it is just a model – everything is changing – what does continuous change look like? Is integration asking where did I probably come from and differentiation asking where will I probably go to next? The derivative – the rate of change - feeds into the probability of where I will end up – a likelihood?

Benford may be all about precision and accuracy and is **base (log base n where n can be anything) and scale (measure in kilometers, metres, miles, acres, square metres – unit) invariant** according to Arno Berger and Theodore P. Hill (many years working on this)

[https://projecteuclid.org/download/pdfview\\_1/euclid.ps/1311860830](https://projecteuclid.org/download/pdfview_1/euclid.ps/1311860830) (2011)

<https://pdfs.semanticscholar.org/5ad7/cb5e71819bbb71af28a6990131a22b291bce.pdf> (1995) – this seems right because if we change the base to large numbers the ratio still applies but what about just two things – self and other - 1,0. Here we get lost in the axiom of choice and many other things. If I am at one and I notice the zero I must make some **effort** to notice it/focus on it/get there – to choose to get there means something. So the choice is I can be 100% self, me or 1 or I can be 95% or 50/50? Me, self, or 1 and 5% or 50/50 the journey to the next thing – zero. When I get there - I find out it is really a 2. Is it a choice or a relationship? Do I stay there? So is this negative power law to whatever base really just the

hypothesis energy and action energy for my self mass? Benford approaches equally distributed at 5 digits - i.e. 5 steps worth of choice – at 5 all have equal energy, effort chance, choice, likelihood – is this where probability and uncertainty kicks in? i.e. we tend to biases of some certainty of choice because the energy choice biases – the sunk costs – at early steps – the first step was difficult but we are used to it now – we know it so well as with the next 3 steps – but the 5 step opens up more possibilities than we are used to? Hill’s analogy is - the well worn paths of choice – the shortest available route – the least energy.

Being a One with Mass – I can’t just keep losing mass to energy for each step otherwise I will fade away to nothingness. I must keep some mass for myself and use some for my stepwise choices.

This fundamental thing seems to be a real number thing – steps – it’s a function of the idea of numbers themselves – that is the most difficult thing for me to understand – to make sense of.

Some investigation by Hill <https://hill.math.gatech.edu/> examines the modulo function the idea of a significand and a remainder but what we don’t yet see is the difference between a gaussian/CLT distribution and Benford – **it is still not clear**. It might have something to do with accuracy and precision – i.e. even though we can choose different BOUNDS for the scale of the measurement – the SCALE – if we were to differentiate in a more precise way – with more close observation – **with greater focus** – greater detail - with more significant differences we might see the normal curve emerge – when we line things up in order on measurement. Maybe too is the notion of including other characteristics in the mix – humans have many characteristics and variations, small world choice, etc – maybe that’s why these complicated and multivariate things approach a Darwinian type normal selection - whereas uncomplex things (like just numbers themselves (e.g. 2 to the power N is Benford (Hill)) or things observed with not enough granularity are seen as Benford. My intuitive example is this – if we are to look at human heights which are characterized as Normal with differences between gender – it can easily be seen that if we choose a scale – i.e. any scale as Hill correctly suggests – but change its precision so instead of measuring human height in centimeters we use a yardstick of three feet and store the result as yardsticks – we get the kind of modulo arrangement and the significand idea as explored by Hill but also the result as well. We do not use averages – we line up people by yardstick measure groups. In group 1 there are many humans because they are greater than one yardstick and less than (modulo – precision and accuracy) two yardsticks tall. There is a much smaller number of humans who are two yardsticks tall or more. Some don’t make to first yardstick and we call them zero. Suddenly we have got to Benford from Normal **just by changing measurement - precision and accuracy** – not Scale or Base. The Precision is one yardstick. The Accuracy is +- one yardstick. I can call the yardstick fred instead and say “one fred” tall” and “two freds tall”. Our choice of yardstick matters and the “rounding” process using accuracy and precision?

**Is this why are some things are Benford distributed and some things are not? Have I found something?**

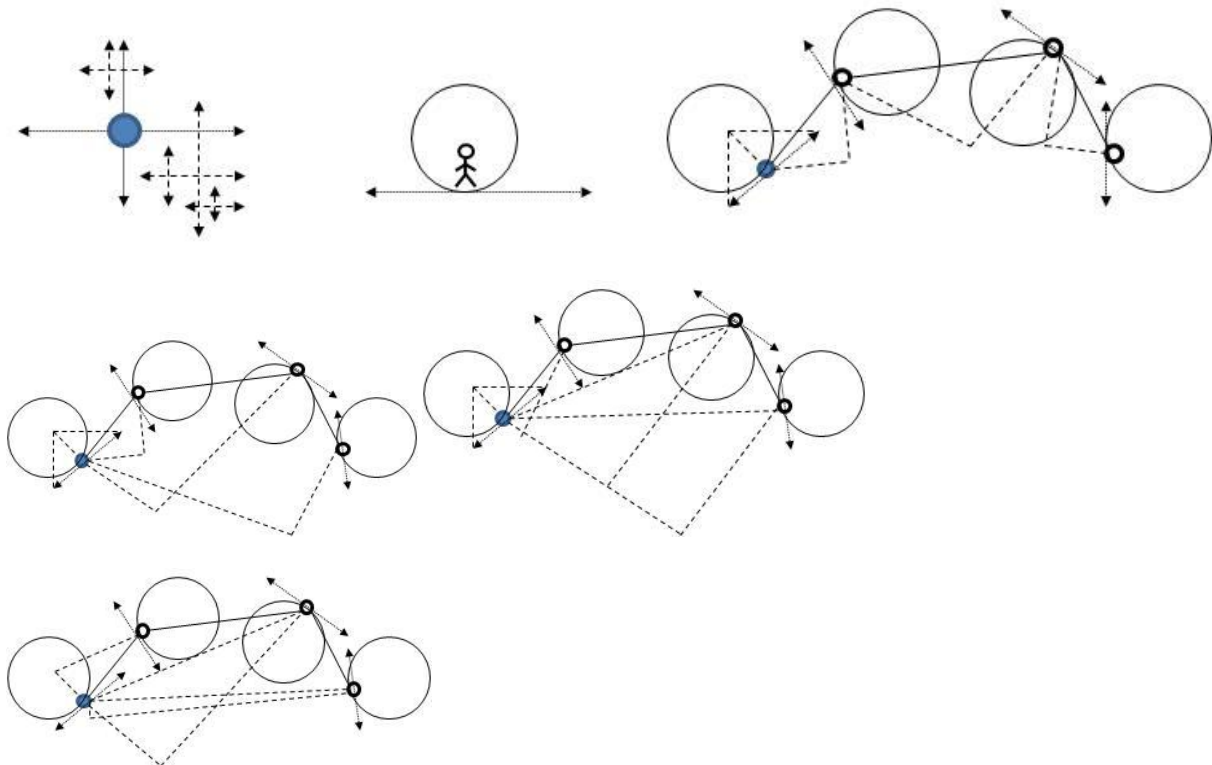
Others have explored complexity - Edward Norton Lorenz found that changing the precision of numbers affected predictability in computer models and the discovery of chaos and further confirmation of an indeterministic universe. Precision is important and part of framing. How to focus, examine and explore

things requires some understanding of how to notice – what to take notice of, how to describe things and a good granularity – a good measure – some understanding of numbers and things in general. It is a real skill and completely at odds with virtue signaling, social justice and “Doing Good”. Trying to make sense of the universe is not a social engagement or a friendly narrative – it is hard, real and unforgiving.

I cannot tell if anything I have thought or discovered has ever been discovered before unless I read everything and analyze everything ever written. This is the job of professionals who must read everyone before them and reconcile with complete understanding all the ideas, questions and answers that have come before in their field of study but also be able to recognize errors, flaws, doubts and notice when something which seems new is really just something which has already been discovered but is now called something else – a “pretender”. Humans will examine and build on history – but carefully with due scrutiny – questioning and checking things. If you stop asking questions or checking things societies can end up in messy places – we have seen this as the ignorant, corrupt and self serving have taken over the discussions – they tear down and attack individuals rather than engage in ideas – They fob off, ignore, belittle, censor, lie etc. They scream their dogma and incite their mobs invoking violence towards their cherished blinkered belief systems. Their certain joy of their certain “justice” models.

I am still trying to understand what opposite of a line is – is it the same line in a different direction? If you are on a continuum is the opposite of that - being NOT on the continuum? How often can you do this? How many steps?

Are things on a straight infinite line or is it just a very large circle – is that why sin/cos/pi always seem to come into things?



## Patterns Observations Bounds Constraints Choices Probability Complexity

Math represents a language which describes things in a certain way. It will always come up against the basics structures of the universe. People sometimes get confused about which part of the universe they are exploring. Whenever you see formulas and equations you can tell a little about the formula by what math symbols it has.

- $2$  raised to the power  $n$  where  $n$  is any positive integer – is a **constraint** of **complexity** and **choice** – the number of steps. (2 directions at each step)
- Einstein's speed of light  $c$  is a **bound** and **constraint**.
- Euler's/Napier's number  $e$  is a **certain infinite** constant so it's a **bound** and **constraint**.
- Power Laws are statements of **observation** and **choices**.
- $\pi$  – indicates **choice** and **probability**.

## Recent Investigations

Statistics, Benford Series, Central Limit Theorem, Bob Doyle, Theodore Hill

## Recent People

**Benoit Mandelbrot** :Year(1924-2010) :Keyword(Maths Fractals Chaos)

<http://mathworld.wolfram.com/MandelbrotSet.html> [https://en.wikipedia.org/wiki/Benoit\\_Mandelbrot](https://en.wikipedia.org/wiki/Benoit_Mandelbrot)  
[https://www.ted.com/talks/benoit\\_mandelbrot\\_fractals\\_and\\_the\\_art\\_of\\_roughness/transcript?language=en](https://www.ted.com/talks/benoit_mandelbrot_fractals_and_the_art_of_roughness/transcript?language=en)

**Alonzo Church** :Year(1903-1995) :Keyword(Recursiveness Mathematics)

<https://en.wikipedia.org/wiki/Entscheidungsproblem>

**Johann Carl Friedrich Gauss** :Year(1777-1855) :Keyword(Math)

[https://en.wikipedia.org/wiki/Carl\\_Friedrich\\_Gauss](https://en.wikipedia.org/wiki/Carl_Friedrich_Gauss)  
[https://www.storyofmathematics.com/19th\\_gauss.html](https://www.storyofmathematics.com/19th_gauss.html)  
<http://scienceworld.wolfram.com/biography/Gauss.html>

**Frank Albert Benford** :Year(1883-1948) :Keyword(Math) [https://en.wikipedia.org/wiki/Frank\\_Benford](https://en.wikipedia.org/wiki/Frank_Benford)

[https://en.wikipedia.org/wiki/Benford%27s\\_law](https://en.wikipedia.org/wiki/Benford%27s_law)  
[https://mdporter.github.io/SYS6018/other/\(Benford\)%20The%20Law%20of%20Anomalous%20Numbers.pdf](https://mdporter.github.io/SYS6018/other/(Benford)%20The%20Law%20of%20Anomalous%20Numbers.pdf)

**Joseph-Louis Lagrange** :Year(1736-1813) :Keyword(Math) [https://en.wikipedia.org/wiki/Joseph-Louis\\_Lagrange](https://en.wikipedia.org/wiki/Joseph-Louis_Lagrange)

<http://17centurymaths.com/contents/lagrange/bk1/article1.pdf>  
<http://www.gutenberg.org/ebooks/author/38388>

**Leonhard Euler** :Year(1707-1783) :Keyword(Math) [https://en.wikipedia.org/wiki/Leonhard\\_Euler](https://en.wikipedia.org/wiki/Leonhard_Euler)

[https://www.storyofmathematics.com/18th\\_euler.html](https://www.storyofmathematics.com/18th_euler.html) <http://eulerarchive.maa.org/>



**Adrien-Marie Legendre** :Year(1752-1833) :Keyword(Math) [https://en.wikipedia.org/wiki/Adrien-Marie\\_Legendre](https://en.wikipedia.org/wiki/Adrien-Marie_Legendre) <https://archive.org/details/elementsgeometr01unkngoog/page/n14/mode/2up> <https://www.britannica.com/biography/Adrien-Marie-Legendre> Are the steps along a circle **real steps of choice** requiring a **slight energy choice** as a deviation from a continuous circle to the equivalent of little straight line steps - See Proposition XXVI theorem.

**Pierre de Fermat** :Year(1601-1665) :Keyword(Math) [https://en.wikipedia.org/wiki/Pierre\\_de\\_Fermat](https://en.wikipedia.org/wiki/Pierre_de_Fermat) <http://self.gutenberg.org/article/WHEBN0030609033/Adequality>

**Euclid** :Year(-323--283) :Keyword(Math) <https://en.wikipedia.org/wiki/Euclid> <https://www.ancient.eu/Euclid/>

**Abraham de Moivre** :Year(1667-1754) :Keyword(Maths) [https://mathshistory.st-andrews.ac.uk/Biographies/De\\_Moivre/](https://mathshistory.st-andrews.ac.uk/Biographies/De_Moivre/) [https://www.informationphilosopher.com/solutions/scientists/de\\_moivre/](https://www.informationphilosopher.com/solutions/scientists/de_moivre/)

**Bob Doyle** :Year(1936) :Keyword(Philosophy) <https://www.informationphilosopher.com/about/> <http://www.eoht.info/page/Robert+Doyle> <https://scholar.harvard.edu/iph/publications>

**Ted Hill** :Year(1943) :Keyword(Math, Benford) [https://en.wikipedia.org/wiki/Ted\\_Hill\\_\(mathematician\)](https://en.wikipedia.org/wiki/Ted_Hill_(mathematician)) <https://hill.math.gatech.edu/> <https://arxiv.org/pdf/1909.07527.pdf>

## Recent Websites

**Information Philosopher** :keyword(Education Philosopher Research) <https://www.informationphilosopher.com/about/>

## Recent Documents

**The Doctrine Of Chances** :Author(**Abraham de Moivre**) :Year(1756) :Keyword(Group Development Choice) <https://archive.org/details/doctrineofchance00moiv> [https://books.google.com.au/books?id=3EPac6QpbuMC&redir\\_esc=y](https://books.google.com.au/books?id=3EPac6QpbuMC&redir_esc=y) [https://openlibrary.org/books/OL6239276M/The\\_doctrine\\_of\\_chances](https://openlibrary.org/books/OL6239276M/The_doctrine_of_chances)

**DE MOIVRE ON THE LAW OF NORMAL PROBABILITY** (Edited by **Professor Helen M. Walker, Teachers College, Columbia University, New York City.**) <https://www.york.ac.uk/depts/maths/histstat/demoivre.pdf> .. *Corollary 5. And therefore we may lay this down for a fundamental Maxim, that in high Powers, the Ratio, which the Sum of the Terms included between two Extrems distant on both sides from the middle Term by an Intervale equal to  $1/2\sqrt{n}$ , bears to the Sum of all the Terms, will be rightly expren'd by the Decimal 0.682688, that is 28/41 nearly....*

**Mathematical Recreations and Essays** :Author(**W. W. Rouse Ball**) :Year(1905) :Keyword(Group Philosophy Maths) <https://www.gutenberg.org/files/26839/26839-pdf.pdf> <http://onlinebooks.library.upenn.edu/webbin/book/lookupname?key=Ball%2C%20W%2E%20W%2E%20Rouse%20%28Walter%20William%20Rouse%29%2C%201850%2D1925>

## References

1. A basic theory of Benford's Law \*Arno Berger†, ‡Mathematical and Statistical Sciences University of Alberta Edmonton, Alberta T6G 2G1, Canadae-mail:aberger@math.ualberta.ca and Theodore P. Hill‡School of Mathematics Georgia Institute of Technology Atlanta, GA 30332-0160, USAe-mail:hill@math.gatech.edu  
[https://projecteuclid.org/download/pdfview\\_1/euclid.ps/1311860830](https://projecteuclid.org/download/pdfview_1/euclid.ps/1311860830) A main point of Theorem 6.20 is that there are many natural sampling procedures that **lead to the same logarithmic distribution**. This helps explain how the different empirical evidence of Newcomb, Benford, Knuth and Nigrini all led to the same law. It may also help explain why sampling the numbers from newspaper front pages or almanacs [Ben], or accumulating extensive accounting data [Ni], often tends toward BL, since in each of these cases various distributions are being sampled in a presumably unbiased way. In a newspaper, perhaps the first article contains statistics about population growth, the second article about stock prices, the third about forest acreage. None of these individual distributions itself may be unbiased, but the mixture may well be. Justification of the hypothesis of scale- or base-unbiasedness of significant digits in practice is akin to justification of the hypothesis of independence (and identical distribution) when applying the **Strong Law of Large Numbers or the Central Limit Theorem to real-life processes: Neither hypothesis can be formally proved, yet in many real-life sampling procedures, they appear to be reasonable assumptions**
2. **Daniel Dennett** - How to make Mistakes :Author(Daniel Dennett) :Year(1995)  
:Keyword(Individual Change Mistakes)  
<https://ase.tufts.edu/cogstud/dennett/papers/howmista.htm> How Things Are, J. Brockman and K. Matson, eds., William Morrow and Company, New York, 1995. pp. 137-144. How to Make Mistakes Daniel C. Dennett Making mistakes is the key to making progress. There are times, of course, when it is important not to make any mistakes--ask any surgeon or airline pilot. But it is less widely appreciated that there are also times when making mistakes is the secret of success. What I have in mind is not just the familiar wisdom of nothing ventured, nothing gained. While that maxim encourages a healthy attitude towards risk, it doesn't point to the positive benefits of not just risking mistakes, but actually of making them. Instead of shunning mistakes, I claim, **you should cultivate the habit of making them**. Instead of turning away in denial when you make a mistake, you should become a connoisseur of your own mistakes, turning them over in your mind as if they were works of art, which in a way they are. You should seek out opportunities to make grand mistakes, just so you can then recover from them....The main difference between science and stage magic is that in science you make your mistakes in public. You show them off, so that everybody can learn from them--not just yourself. **This way, you get the benefit of everybody else's experience, and not just your own idiosyncratic path through the space of mistakes**. This, by the way, is **what makes us so much smarter than every other species**. It is not so much that our brains are bigger or more powerful, but that we **share the benefits that our individual brains have won by their individual histories of trial and error.....**We don't usually have to risk life and limb in order to learn from our mistakes, but we do have to keep track, and actually attend to them. **The key to that is first, not to try to hide your mistakes. If you hide them, you may, like the magician, enhance your reputation, but this is a short-range solution that will come to haunt you in the long run**. Second, you must learn not to deny to yourself that you have made them or try to forget them. That is not easy. The natural human reaction to mistake is embarrassment and anger, and you **have to work hard to overcome these emotional reactions**. Try to **acquire the weird practice of savoring your mistakes, delighting in uncovering the strange quirks that led you astray**. Then, once you have

sucked out all the goodness to be gained from having made them, you can cheerfully forget them, and go on to the next big opportunity.

3. **The Two-Stage Solution to the Problem of Free Will Robert O. Doyle In Antoine Suarez Peter Adams (ed.), *Is Science Compatible with Free Will?* New York, NY, USA: Springer. pp. 235-254 (2013) Abstract** Random noise in the neurobiology of animals allows for the generation of **alternative possibilities for action**. In lower animals, this shows up as behavioral freedom. Animals are not causally predetermined by prior events going back in a causal chain to the origin of the universe. In higher animals, **randomness can be consciously invoked to generate surprising new behaviors**. In humans, **creative new ideas can be critically evaluated and deliberated. On reflection, options can be rejected and sent back for “second thoughts” before a final responsible decision and action. When the indeterminism is limited to the early stage of a mental decision, the later decision itself can be described as adequately determined. This is called the two-stage model, first the “free” generation of ideas, then an adequately determinism evaluation and selection process we call “will.”**
4. **Bob Doyle - Two-Stage Models for Free Will**  
[https://www.informationphilosopher.com/freedom/two-stage\\_models.html](https://www.informationphilosopher.com/freedom/two-stage_models.html)
5. Beta distribution (Karl Pearson)  
[https://en.wikipedia.org/wiki/Beta\\_distribution#Bayesian\\_inference](https://en.wikipedia.org/wiki/Beta_distribution#Bayesian_inference)
6. Binomial theorem <https://people.richland.edu/james/lecture/m116/sequences/binomial.html>
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14. Wave function [https://en.wikipedia.org/wiki/Wave\\_function](https://en.wikipedia.org/wiki/Wave_function)
15. Sin Wave [https://en.wikipedia.org/wiki/Sine\\_wave](https://en.wikipedia.org/wiki/Sine_wave)
16. Sine <https://en.wikipedia.org/wiki/Sine>
17. Double Slit Experiment [https://en.wikipedia.org/wiki/Double-slit\\_experiment](https://en.wikipedia.org/wiki/Double-slit_experiment)
18. Benford Online <http://www.benfordonline.net/>
19. Fuzzy Central Limit Theorem <https://mathworld.wolfram.com/CentralLimitTheorem.html>
20. Erica Klarreich A Magical Answer to an 80-Year-Old Puzzle Using crowd-sourced and traditional mathematics research, Terence Tao has devised a solution to a long-standing problem posed by the legendary Paul Erdős. <https://www.quantamagazine.org/terence-taos-answer-to-the-erdos-discrepancy-problem-20151001/>
21. The Erdos discrepancy problem Terence Tao - Cornell University  
<https://arxiv.org/abs/1509.05363>
22. Also see Waring conjecture  
<https://mathworld.wolfram.com/WaringsPrimeNumberConjecture.html> , Golbach Conjecture  
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<https://mathworld.wolfram.com/WaringsProblem.html> Vinogradov’s Theorem  
<https://mathworld.wolfram.com/VinogradovsTheorem.html> Hilbert Waring  
[https://proofwiki.org/wiki/Hilbert-Waring\\_Theorem](https://proofwiki.org/wiki/Hilbert-Waring_Theorem) Every integer is the sum of 4 squares,
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29. Hyperreal Numbers [https://en.wikipedia.org/wiki/Hyperreal\\_number](https://en.wikipedia.org/wiki/Hyperreal_number)
30. **A Retracted Paper on Sex Differences Ignites Debate - Controversy surrounding a mathematical model to explain the so-called "greater variability of males" hypothesis falls two versions of a paper—but critics of the work wish it were still published.** Anna Azvolinsky -Sep 27, 2018 <https://www.the-scientist.com/news-opinion/a-retracted-paper-on-sex-differences-ignites-debate-64873> Last year, mathematicians Theodore Hill and Sergei Tabachnikov submitted a paper on a mathematical model that attempted to explain why some studies have **found greater variability in various traits among males than females of many species, including humans.**
31. **The Ted who the Left don't want to talk** **A maths professor who wrote a paper on male-female variation found himself censored and shunned by the academic establishment** Toby Young Features 28/03/2019 <https://standpointmag.co.uk/issues/april-2019/the-ted-who-the-left-dont-want-to-talk/> Ted Hill must have known he was playing with fire by defending the VH, even if his model was intended to explain the greater variability phenomenon across a vast range of different species, not just homo sapiens. In 2005, Lawrence Summers, then the President of Harvard, got into trouble when he mentioned it as a possible explanation for why there aren't more female professors in the maths and sciences at Ivy League colleges. This was at a conference on Diversifying the Science and Engineering Workforce and it wasn't received well. Didn't Summers realise that it was entirely to do with straight white men discriminating against women to perpetuate their privilege? **One of the female professors in the audience walked out in disgust and it snowballed from there.** Distinguished alumni **withheld donations**, Harvard's Graduate School of Arts and Sciences passed a motion of no confidence in Summers and he was forced to apologise — over and over again — like a supplicant at a Chinese re-education camp. At one particularly fraught meeting, **Nancy Hopkins, a biology professor at MIT, said that if she had to listen to him say another word she would be physically sick.** In the end he had to resign.
32. **An Evolutionary Theory for the Variability Hypothesis Theodore P. Hill** <https://arxiv.org/pdf/1703.04184.pdf>
33. **It's Official: Even Hard Science Entering New Dark Age** Lance Welton • October 20, 2018 <https://www.unz.com/article/its-official-even-hard-science-entering-new-dark-age/>
34. **The Mathematics of Benford's Law - A Primer** Arno Berger and Theodore P. Hill April 22, 2020 <https://arxiv.org/pdf/1909.07527.pdf> there is **currently no simple intuitive argument to explain the appearance of Benford's law** in the wide array of contexts in which it has been observed, including statistics, number theory, dynamical systems, and real-world data. More concretely, there is no theory at all, let alone a simple one, even to decide whether the sequence (1,2,5,26,677, . . .) starting with 1 and proceeding by squaring the last number and adding 1, is Benford or not; see Example 38(i). The interested reader is referred to [2] for a more detailed treatise on the difficulty of finding an easy explanation of Benford's law
35. **The Discovery of Global Warming** <https://history.aip.org/climate/chaos.htm>
36. **Strange Attractors** <https://mathworld.wolfram.com/StrangeAttractor.html>