Questioning Numbers

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Introduction
I realized my number plane was different to many and had multiple implications for mathematics.

Framework
 Group frameworks, schemas and measurement**.**

Population

Human groups – groups of humans working together or surviving in groups. Nation states. Individuals within Nations.

Questions

1. Are there two distinct type of numbers?
2. Is negative and positive direction of energy and choice?
3. What are implications of describing all possible numbers in one model?

Initial Conditions

Groups, Nations, Order, Schemas, Patterns, Certainty.

Self reference

All my models so far.

Initial Thoughts

I am biased towards my own models. This work is entirely my confirmation bias.

I originally exposed this model on 2/1/2020 in https://humanistman.com/wp-content/uploads/2020/01/Corruption-Measurement-and-Implementation.pdf where I was looking at abstraction and measurement in the context of corruption and certainty. And then some more here https://humanistman.com/wp-content/uploads/2020/05/Relativity.pdf - which I had also exposed the Gamma Function but I think the Digamma function is also strongly linked (thanks to Vi Hart for exploring that)

I was looking at working my Evaluating humanity article when I re-discovered Vi Hart's work *(she is an independent and gifted thinker – for those feminists and other extreme groupthink idiotologists I recommend looking at her youtube clip on Gender https://www.youtube.com/watch?v=hmKix-75dsg)*

I had also described a recent model about apples on trees, in orchards, in environments and how the discovery of those apples required navigating concepts of tree, orchard and the expenditure of energy to discover those "same" apples.

I had also quite flippantly reinvented the number plane to cover all numbers at all measurement, all precision from zero to infinity. In one simple model.

I was also thinking and visualizing models for representing fours and the notion of solid pairs. The idea that somehow the individual is paired to the universe. This meant there at least had to be two things operating independently of each other but somehow interrelated. This pleased me because getting a two input, two output model of choice seemed somehow fundamental and it would allow me to play with those four box diagrams with arrows of direction through as a model of human development. Playing with twos, threes and then fours being pairs of twos – appealed to me.

I thought it might be a nice analogy and maybe a useful model.
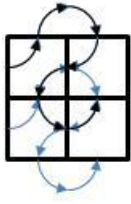
Numbers - Length

From Einstein's Equation there are **two distinct types of numbers** – numbers of mass/certainty and numbers of energy/hierarchy/level/choice/path.

Operations like adding and subtracting are simple enough and show simply a direction choice on the abstract number plane – forwards or backwards. Which we represent as plus and minus.

We put zero between the positive and negative and infinity at each end.

We then say that each step along the way in any direction is a defined certain step and the step has a permanent position on the number plane. That position is always there just waiting to be used. It's a permanent useful abstraction.

We then say that in any one of those positions we can put a number from 0 to 9.

Then we have to give some instructions so people can explore the number.

So we give instructions which say - set out in a positive direction and REMEMBER each number in EACH POSITION. Maybe even write it down somewhere.

How do they know when to stop?

Well , as we know , everything is self –referential and recursive, so we say – well you know how to count and remember breadcrumbs (from Hansel and Gretel) don't you, or you have some piece of paper or working memory where you know how to simply count don't you?

So before they set out we give them another number which they simply add 1 to for every step they take forward – count their SAME (like apples are the SAME thing) steps. Once they do that they will have discovered all of the digits in all of the positions on their journey. This is the called the step length – the

number of steps to take on the journey; And if they remember or write down the numbers at each position along the journey – then they have the full number.

Numbers – Precision – decimal point position

But what about infinitesimals, fluxions, decimal points and the like?

Well given that they know how to count and they have already taken note of the Step Length of the number – we can also give them a position of a decimal point. So we can say when on your journey you get to this step count – this is the decimal point position.

This decimal point position tends to be used more for negative power laws and ignored for large numbers. i.e. when we say 10 to the power 3 – we don't say 1024 – it is a short cut nomenclature and the accuracy is also a short cut. There are many of these conventions and notations for taking short cuts and making assumptions.

Numbers - Accuracy

How accurate is the number?

Well if it does not have an **accuracy number** which accompanies the instruction for the journey to get the number then the number is **absolutely certain** (just by playing by the rules of journeys in our abstract model we can make it so) but if it's a measurement of something we may wish to put some accuracy estimates around it - by simply giving another pair of numbers of length and precision to describe the accuracy.

And then we tend to say the number is somewhere between two positions in both directions – probably.

This is how we express probability.

Narrative

I think I got numbers when I was about 8, I got the 2 times table series and infinity.

I understood Plus and Minus.

I learned about moving up and down, backwards, forwards along the infinite number line by way of functions.

What I did not get was being told that **minus 3 times minus 3 equals plus 9**.

Or that by using power laws like squares or roots we get two answers. And then we had to invent imaginary numbers - aren't all numbers imaginary?

It all seemed a bit convoluted to me and I could not understand – **and still do not understand** – why exactly in math minus 3 repeated recursively is not minus 9 but + 9. **How does it help anything? Surely it is not just about Pythagorian area?**

Quite clearly two different things are being mixed up here. One is a count of steps and the other is a direction. Why make the two things the same – what's the benefit – what's the problem that is trying to be solved by making it this convoluted?

Clearly there is the idea of counting "sameness" in the case of math all sameness is represent by counting steps along the positive integer number plane. There is other manipulations like precision but also a choice of two directions plus or minus.

Hierarchy levels, the orbit of planets, starts – everything has a direction – and I am happy with that. Distance, time, energy are all there as well but clearly so is direction.

Implications

Just like humans mix up measurement, accuracy and precision I think too they mix up numbers and the methods used to navigate numbers as well. I have just explained in my simple model the entire abstract number plane from 0 to plus and minus infinity of all possible decimals – in one model.

Graph theory helps – think of journeys along a highly complex THREES structure of choices and paths. Navigation of all threes is possible.

Also too remember to **count apples** as apples – which have "definition" of same/different - (addition/subtraction integers –divisions of positive and negative numbers are allowed) and **steps**, choices, options, energy, level (hierarchy) as things which **have direction**.

Maybe we could get rid of the square root of minus one?

We could accept that the square root of plus 9 is NOT both Minus 3 and plus 3 simultaneously - (I wonder if this is where neuroticisms develop?)

We could think of how we frame investigations into math problems by understanding the problem better and being able to express it in as simple terms as possible.

Absolute value, modulo arithmetic – maybe we could rethink some things and do a bit of a tidy up.

Not obvious Example

In Vi Hart's video of digamma (wau) http://www.science4all.org/article/eulers-identity/ she ends up in circles after going along a negative direction towards a positive direction.

Zero and infinity of course close the bounded loop. It does not matter of you go in a negative direction or a positive direction. This is Planck, Einstein, Uncertainty, Black holes, Stephen Hawking's work, Math,

string theory ([Leonard Suskind](#)), [George Smoot](#)'s background radiation, etc – all this stuff sits in that infinite, zero, bounded, uncertain, complex (of at least threes), probabilistic space.

We are going to imagine sending our intrepid explorer of the infinite abstract number plane with a series of instructions. In this case – however the explorer is going for an infinity walk. We get two explorers to head out in opposite directions and that the number will be revealed once they reach the decimal point position which is the same as the length position for the number at infinity. So off they go.

You will note that at infinity the ONLY two NON ZERO numbers which have some value of a kind are right next to ZERO at the closest possible point on the abstract number line. So if they somehow knew that in advance and made some bounded and constrained agreement they could have stood in the first positions and communicated – shake hands across the zero – which is as close as they could ever be going into two directions tending to absolute precision.
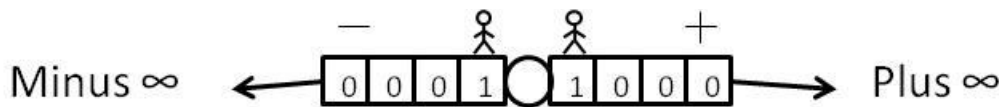
You can see that all I have to do is make all the numbers in all the positions zero for infinity and that I arrive back at the same spot. I have either taken no journey at all or gone around in circles for infinity – in either direction – I could even drop decimal points anywhere on any journey – who would know for certain?
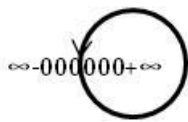
Dance Steps across Paths of Choice

Think of Tango dance steps – steps forward – steps back – to the side then forward again. A series of choices expressed in a set of deliberate instructions after each step.

We could construct mathematics that way. Euclid's n dimensional space of THREES could be navigated by dance step instructions. Take this choice, go backwards, go forwards, etc.

I have not studied enough to know but I cannot seem to find some foundation discussion about the nature of direction and choice – it is like the number plane which was sufficient for addition and subtraction of whole numbers did not develop enough when power laws and graph theory came along (nodes, edges, choices). I did note a professor at John Hopkins University who was deliberately using choice notation in understanding complexity – and this seems more in line with my thinking – but he

explains things very well and shows far more insight than I could ever have. He is a current world leader in thinking in this area. I am not a mathematician but I do like to explore.

Ian McCulloh Betweenness Centrality – John Hopkins university
https://www.youtube.com/watch?v=0CCrq62TF7U , **https://www.youtube.com/watch?v=-ANEqyrJOac** , **https://www.youtube.com/watch?v=5Hw1OmWOLA8**

Messages

'My working theory is that other markers have placed me on the opposite side of a cultural divide that they feel exists, and they are in the **habit of demonizing the people they've put on this side of their imaginary divide with whatever moral outrage sounds irreproachable to them**' *:Author***(Vi Hart)** *:Year(2016) :Source Document(On Knives and Files, Freedom and Fascism) :Keyword(Humanism Development Individual)* http://vihart.com/on-knives-and-files-freedom-and-fascism/ https://metasd.com/2018/01/vi-hart-positive-feedback-driving-polarization/

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