

THE MATHEMATICS OF THE BRAIN

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ABSTRACT

It has never been accomplished to describe our behavior mathematically. Due to the fact that human behavior is highly erratic even the understanding of its causes are still sketchy. Assuming that we are all equal in our regulation of thought and behavior there are simply too many differences and partially inconsistencies, the attempts stopped in its onset. For having defined the five major groups of mankind, the sociopath, the artist, the median, the, and the psychopath [1] each group is related to each other but his decision making is hardwired differently and thou probably more easy to grasp than sticking to the consistency of all appearance for the regulation of behavior is quite similar in the five groups but different in its limits. Using the more formalistic tools of mathematics, this can open the review of the equations in verifying or falsifying the predictions on future behavior in an individual, at least after defining the group affiliation. Therefore a self-test has been established [2] to predetermine the group. In a hybrid-species [3], the eight main neuro-receptors in each group to have two optional origins. Measuring each by its own dominating patterns not only the amalgamation in each group can be defined but also the native patterns of the non-hybrid ancestry [4]. Not only the variance of possible combination can distribute to the limits of brain-equations but also the time-axis of our memory, being rather different, illuminating the highly different decision making among offspring of hunters and farmers. A phenomenon probably explaining the variance in processing memory by peripheral distributed groups of ADHD and autism for ADHD memorizes in combining data with importance and such is been given an emotional response to the recall, while autism is mainly been given the exact time reference stored in a continuous frame of time-preference. The latter therefore have problems to distinguish between important and not important and the former lacks a passing timeframe, mirroring the primary form of acquiring resource, farming or hunting. With the boundaries set the graphs of the equation on resource-projection looks highly different by only changing its limits.

Having not only focussed on the designation of human groups but also in behavioral shifts over time (from social to non-social) and the exact denomination of similar behavior, some rather simple equation could be defined to predict and consequently proof the predicate. Not only the proper use of words is necessary but also awareness that non-social individuals will often not answer truthfully. A topic that also can be mathematically predicted. The outcome will revolutionize our perception of mankind and ourselves, dawning more than one academic discipline, probably enabling us to go virtual and back again.

KEYWORDS

Mathematics, Applied Mathematics, Neurology, Behavioral Theory, Scientific Theory.

1. METHOD

The outcome of this paper is a work in progress and by no means conclusive. It was possible due to the collection of about three thousand biographies on addicted persons at first by the author himself, some were reviewed up to 4 times from 2008 to 2012. Furthermore coming to the conclusion that the attempts to subsume all behavioral traits of different groups in a single person, the conclusion was drawn to simplify the approach, an effort needed to cut down the "jungle of

hypotheses" coming to falsify or limit some and eradicate others. Literally starting without any preconceptions at all.

For the patterns of consumption are highly different among them and people from some groups like ADHD are overrepresented (Fischer et al. 2013) it got easy to predict consumption or personality traits by knowing the respective other. Also, behavioral shifts from social to non-social behavior occurs common among addicts, especially in a continual resource shortage. Apart from that, a meta-analysis of studies about trauma and depression showed a determining timeframe of about 1 year. Does a behavioral pattern continuously exist one year or longer (E.Foa et al.) its consolidation gets a lot more likely, unveiling a consolidation rule of the brain: If a pattern is used for a year or longer it stabilizes. For the brains seems to suggest that it will be of further help. It not only defines the timeframe of treatment but distinguishes in-between short-time changes and long-term adaptations, predominantly following certain pathways. After 2 years of reviewing addicted persons, the habit occurred to guess the patterns of consumption before even speaking by assuming on socio-economic traits and the ability to empathize, a typical trait among ADHD, predetermining the consumption of stimulants and morphines. Working with the hierarchy of needs in determining the origin of behavior, different modes could be defined. The most basic is the survival mode (M1). The shift in this mode is quite common among addicts for they not only spend their resources for drugs and are under pressure to gain more also the drugs seem to affect social behavior. Especially cocaine for it suggests in the rush a quick resource expansion while afterward the table is turned and the process to a non-social-shift (by a felt exponential decrease) is speeded up, highlighting again a central modulator of behavior, the projection of resources. In gaining a sustained level on enough resources level 2, the reproductive level is reached (M2). This mode was called reproduction mode for it contains the second imperative in human behavioral patterns, sex. Overcoming this limits the next mode would be the development of skills defined as mode 3 (M3), a mode mainly reserved for mankind for it improves the future acquirement of resources by training skills.

Being a work in progress the next step was obviously to prove certain predictions on individual behavior leading not only to the verification or falsification of predictions in the interaction with clients but also to the finding of physiological patterns of perception that are related to a certain pattern of behavior and memorization. The speed of reading, for example, is highly related to the process of memorization and the skills in empathy. An empathic person, therefore, has significantly worse memory and does read slowly due to the fact that the eye-movement is triangulated. A quite helpful topic in measuring emotional mimic output on one hand but an obstacle reading a sentence in a straight line. For the emphatic person does speak two languages at once, the memorization of it is much more difficult underlining different basic principles in perception.

Having gained enough data to distinguish the 5 groups and exclude non-social subjects for they often give random answers, the stage was set for the first equations simply using logic and basic principles of mathematics.

In can be concluded thou, that the path to gain the equation was a mixture of unbiased measurement, qualitative and quantitative approaches and last but not least a verification or falsification of prediction. For the only effective tool to proof or falsify a hypothesis on the "brains mind" is to draw projections and measure the outcome in subjects that mainly answer correctly (the 3 social groups) while being aware of the limits in each group and the confusing naming of neurological patterns of perception, thoughts, and behaviour.

As such the understanding of empathy is very different among each group. For an autistic person, the evaluation of mimic output means an intentional thought after it has occurred, relating it to

other expressions like the spoken words. For a person with ADHD the process is fully automatic and unwittingly, feeling the expressed emotionally as if they would be his/hers. The word *empathy* thou means a completely different neurological pattern in both groups and has to be distinguished by explanation.

Back to the start of the methodology it pinpoints at the necessity to let go all preconceptions for we intend to measure others by comparing them with ourselves. Still the main reason for misunderstandings, deceptions and the lack of knowledge on that topic. Having understood this, each reader can transcend the understanding of the finest scientists for they are mainly stuck in the confusing consistency-of-all-principle. Sharpen your tool and dig for the treasury that is not excavated yet.

2. RESULTS AND DISCUSSION

Beginning with the non-social-shift-equation it seems to be defined by a decline of resources over time. Imagining social behavior as willingly not maximizing the own option and leaving or gifting it to the social space. In the decline of resources this behavior is not sustainable anymore and a shift occurs by shutting down social behavior step by step. In case this continues over time it will get fixed after about a year letting go the learned change of different perspectives. A pattern of processing social people have learned in childhood gaining a broader view and enabling the person the ascend in social ranking:

2.1. The Non-Social-Shift-Equation

$$dPS_{\text{Soz}}/dt = PS_{\text{Soz}} (e_{\text{Soz}} - t_{\text{Soz}} PS_{\text{Soz}}) \quad dPNS_{\text{Soz}}/dt = PNS_{\text{Soz}} (e_{\text{NSoZ}} - g_{\text{NSoZ}} PS_{\text{Soz}}) + t_{\text{PNSoZ}}$$

PS_{Soz} = Number of social subjects in a population

PNS_{Soz} = Number of non-social subjects in a population

e_{Soz} = Entry of social subjects into work life

e_{NSoZ} = Withdrawal from non-socials from work life

t_{Soz} = Transforming from social to non-social per total amount of non-socials

g_{NSoZ} = Entering non-socials into work life per each social subject

t_{PNSoZ} = Transforming to secondary non-social per each primary non-social

This equation is quite similar to the Lotka-Volterra transformation for the relation in-between socials and non-socials in a population is similar to the predator-prey relationship in nature, being of benefit for both by enhancing evolutionary selection. But like in nature this can turn out fatal when the ratio is disturbed for too successful predators may eliminate all prey and finally eradicate themselves. A cycle mirrored in economic cycles. Mainly there are two related oscillating curves representing social and non-social individuals in a population. But there also seems to be a meta-modulation for there is a tendency to increase non-socials by the mentioned shift. When the arithmetic average is shifted beyond a point, I may call it MANS (maximum allowable non-socials), the limits of growth are exceeded and a contraction has to occur. This phenomenon can be easily described by old advice on how to eradicate rats on an island:

At first, you shall catch as many rats alive as possible. Then dig a hole with walls they can not escape and put all rats inside (a place of shrinking resources). Wait until only a few have survived (the non-social-shift by rat eat rat) and set the survivors free. That will create rat-eating rats (competitive advantage) all around and they shall finally exterminate themselves (having artificially shifted the number of rat-eating-rats beyond the mathematically tolerable limits),

Thus the ratio is vital for both groups to keep them not only in check but boost the development by extracting the weak and regulating the number of non-socials. Therefore it is obvious that non-socials, especially the secondary ones, recruit from a lack of regulation.

The stock index is mirroring this ratio excellently and could probably be used to keep the balance while the limits are intact. For non-socials are only regulated by other non-socials and the judiciary system, if the latter is corrupted it will give way to an explosion of badly selected non-socials, at the end sinking the ship, we call society.

2.2. The Quotion for Individual Triggering of Non-Social Behavior

Using the decision making for non-socials to gain Ritalin® by the doctor and selling it, this can be brought in the following relation:

$$P(R) - E(L) - V_{\min} \geq 0$$

$P(R)$ = Price of Ritalin ® on the illegal market

$E(L)$ = Energy for deception and risk in selling by the non-social

V_{\min} = Minimal income by this deviant activity

Thus the decision making for each non-social to cheat is highly dependent on the expected income and the risk to take and the energy to spend by getting Ritalin prescribed.

2.3. Levels of Multiplication and Variance, The Variance-Equation:

The five human groups are defined by a different construction of the I, the interface of a person to his reality. Therefore individuality is a by product of the hybridization process an estimate to the number of possible iterations in a person, the genetical basis for variance and individuality. For non-social identities do vary a lot the total overall amount of social individuals using CEE can be assumed.

Multiplicators for individuality: The differentiation in the spectrum of S, the construction of the $\gt I <$ I, level of universalization U, hierarchy H, individual amount of resources R and group-size G is defined with 5 per level.

2.3.A. The Big Five Spectrum (2, 8 or 80%) S = 5

4.4.B. Eight different important neurotransmitter-systems forming the individual, serotonin, endorphin, dopamine, GABA, catecholamines, etc. (for each one there are two options of decent)

2.3.B. Way of I-Construction (Competitive Vs. Non- Competitive)

2.3.C. Level of Universalization of Social Behavior (Couple, Small Group, Clan, Nation, Universal)

2.3.D. Location on The Social Ladder (Hierarchy H, Gender 2 G, Resources R, Group-Size Gr., Culture C) O

Each letter has to be seen as multiplicator: The possibility of variance V of P (personality) is indeed:

$$V(P) = \int_0^n 1 E(8M)^2 * 2 * 2 * S * I * U * O * H * R * G * \int_0^n 1 E(8M)^2 \int * 2 * 2 * 5 * 5 * 5 * 5 * 5 * 5 * 5 * 5 = 11.250.000 \approx n$$

Eleven million two-Hundert-fifty-thousand variant personalities are seemingly enough for a complete individualization and are the first approach.

2.4. Equation: Projection of Resources

$$P(R) = \int (M1 \text{ to } M3) f(R) dR / Mct$$

R for resources, Mct for a continuous time of memory

For the former performance of resources is drawn on a time frame a long-term validation is highly dependent on the "length of compared memory". The shorter the timeframe pending on the group of origin the more important close related temporal developments will influence the projection to the future, shaping the mindset of farming autists and hunting *ADHDs*. As such shaping mindsets in-between long- and short-term planning, risk-taking or risk-avoiding behavior, quick or slow traversing resource curves and emotions and last but not least conservative or progressive thinking. The individual point of view thou is defined by the way our neuro-receptors are hardwired meaning the extent and distribution of hybridization and the more or less random amalgamation of different genomes from the male and female. That shows that the patterns not only shift over generation but also in siblings with the same ancestry creating patterns that underlay economic cycles. This genetical permutation may be key for the conclusive understanding of the economy, abolishing and different schools of thought and working on reality instead.

For the author of this paper is no mathematician, the proof and further development has to be done by a specialist. What can be said for certain is that there are some other equations of the brain "out there" and that the consistency al all men assumption is wrong and the reason for a lot of non-sensical science that is still stuck in our worldviews.

But let us appreciate the variance for every physicist knows, it enables accurate measurement.

3. CONCLUSIONS

Gaining a lot of simplicity and correct predictions the mathematics of the brain can come to new results to overcome the enormous lack of knowledge about the principles of our mind. The tendency to assess others in comparing them with us is seemingly far spread but the reason for the tendency to wrong results. For the mathematics seems to be "build" in our brain we are still incapable of using it in a reasonable way, by exploiting others or being caught in groupthink, pending if you are a social or not-social specimen.

For the neurochemistry and the neuro anatomy is only one side of the medal, the other side, the understanding of ourselves is still in its infancies. With the development of AI and modern technologies, the two sides could easily be interlinked, creating future options for the storage of mind and the later replacement of the physical part of the body, achieving technically immortality and the transcendence of the mind. But the pathways for each of the five groups will be different for the limits and perspectives are very different. But also after transcending into VR and back the need for diversity in men will stay the same. Therefore the mathematics of the interdependency is still unwritten but hopefully close at hand. The authors point of view is that reasoning and evolvment is the only chance for all of us to reach a future at all, even when three out of five groups may intend to go back, this option is gone and is of essence to show them that there are

times to progress and times to go back. As such I do think that the former is the only way for we have jet jumped from the past but not arrived anywhere. For if we do not expand the space of living by any means we will bring mode one to live and therefore suffer a genetical or technical singularity leading to sudden death or down-breeding.

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