



laetus in praesens

Alternative view of segmented documents via Kairos

24 August 2020 | Draft

Humanity's Magic Number as 1.5?

Dimensionless constant governing civilization and its potential collapse

-- / --

Introduction

Preliminary checklist of recognition of 1.5

Potentially significant approximations to 1.5 in practice?

Clarification of the magic square governing human civilization?

Radical possibility of 1.5 resulting from golden ratio design by committee

In quest of a language of proportion as the language of appropriateness

Adaptation of the Uncertainty Principle to the social sciences?

Language of proportion implied by poetic justice

Deflowering of civilization versus Flowering of civilization: an aesthetic contrast?

Spiral of silence and the associated "conspiracy" of silence

Mysterious challenge of doubling, replication and multiplication

References

Introduction

Never in the history of humankind has a number been so widely publicized in so many forms. As a distance it is now promoted as the key to prevention of the spread of infection in what has been declared a major challenge to global civilization as previously known. As a temperature, constraining its increase is the primary target for climate change strategies -- with the failure to achieve it associated with an expectation of sea level rise of 1.5 feet.

Economic growth over long periods, as GDP, is recognized as increasing at that rate -- expressed as a percentage. The interest rates offered by central banks hover around that figure, if only currently. The sub-fertility replacement rate of 1.5 is a focus of concern with respect to the aging population of many developed countries. And with the light of the Moon framing so many monthly cycles, it is not surprising to discover that it is approximately 1.5 light seconds away.

Constants -- as [physical constants](#) -- are understood to be fundamental to the organization of nature and of reality as it is perceived (*List of physical constants*, *Wikipedia*). Physics carefully distinguishes [dimensionless physical constants](#) as pure numbers having no units attached and having a numerical value that is independent of whatever [system of units](#) may be used.

The existence of analogous constants fundamental to psychosocial organization has been less evident, although various indications can be noted (*Comprehension of Numbers Challenging Global Civilization*, 2014). The most widely cited paper in psychology is that of [George Miller](#) (*The Magical Number Seven, Plus or Minus Two: some limits on our capacity for processing information*, *Psychological Review*, 1956). In more general terms, potential consequences are explored by David Robson (*Has humanity reached 'peak intelligence'?* *BBC*, 10 July 2019; *The Intelligence Trap: why smart people make dumb mistakes*, 2020). There is therefore a case for exploring whether 1.5 constitutes "a numerical value that is independent of whatever system of units may be used" -- as would appear to be implied by its current widespread importance

A first approach to this possibility is a preliminary literature search to clarify the range of domains in which 1.5 has achieved prominence. This is not sufficient in that the occurrence of that number may be variously disguised. The checklist of obvious examples is therefore followed by an indication of domains in which the role of 1.5 may be inferred as a possibility.

Having framed 1.5 as a "magic number", there is a case for concluding with a speculative focus on one of the most fundamental magic numbers as it features in the simplest [magic square](#) as a [magic constant](#) -- namely 15. This has the potential merit of indicating how the disparate domains governed by 1.5 may be interrelated.

The speculation can be taken further by exploring the extent to which the focus on 1.5 is a consequence of "design-by-committee". This has unconsciously avoided any effort to highlight a "magic constant" of human-scale significance, namely the [golden ratio](#), of which it is a crude approximation. It would seem that there is a human need for a "language of proportion" to render credible the challenges faced

by humanity -- especially if these constitute issues of proportion. Numbers as currently used are readily recognized as an inappropriate language for that purpose.

Preliminary checklist of recognition of 1.5

As a preliminary exercise, the following is considered purely indicative -- a "work in progress" and an invitation to far more rigorous elaboration. References have not been included. It may be more appropriate to exclude certain instances cited and to consider other possibilities for clustering those included.

Degrees

- Climate (heating):
 - On October 8, 2018, the Intergovernmental Panel on Climate Change (IPCC) released a special report on keeping warming below 1.5°C. It was during the Paris climate negotiations that the 1.5C target became a reality. At 1.5 degrees Celsius warming, 6 percent of the insects, 8 percent of the plants and 4 percent of the vertebrates will see their climatically determined geographic range reduced by more than half. 1.5°C emission pathways are defined as those that, given current knowledge of the climate response, provide a one- in-two to two-in-three chance of warming either remaining below 1.5°C or returning to 1.5°C by around 2100 following an overshoot.
- When body temperature rises 1.5 degrees higher than normal, this is indicative of a low-grade fever
- Each hour after death, the body temperature falls about 1.5 degrees Fahrenheit (0.83 degrees Celsius) until it reaches room temperature.

Percentages

- Economics:
 - Economic growth: On average, GDP growth per person since 1750 has been 1.5% per year. This means that each generation has been around a third better off than the one before it, on average.
 - Inequality in consumption: In 2005, the wealthiest 20% of the world accounted for 76.6% of total private consumption; the poorest fifth just 1.5%
 - A bank will experience a loss based on past experience and historical data if the net interest income generated by a bank is equal to 1.5 percent of its assets.
 - Interest rate: The Official Cash Rate (OCR) has been reduced to 1.5 percent. The real **risk**-free rate is 1.5 percent.
 - European Union countries are estimated to suffer a long-term damage equivalent to about 1.5 percent of annual economic output if the UK leaves the bloc without a free trade deal
 - Inflation rate: ?
- Biology:
 - Population replacement level: The total fertility rate is 1.5 births per woman in Europe and Canada under conditions in which it is estimated that the requisite replacement level is 2.1 per woman. In most OECD countries, the total fertility rate sits at somewhere between 1.4 and 1.9 children per woman, with rates falling as low as 1.3 in Italy and Spain, and less than 1.0 in Korea.
 - Exome: The human genome consists of 3 billion nucleotides or "letters" of DNA. But only a small percentage — 1.5 percent — of those letters are actually translated into proteins, the functional players in the body. DNA coding: DNA codes for only 1.5 percent protein
 - Masking: It has been claimed that if a sick person and a healthy person are both wearing masks, there's only a 1.5% chance of transmitting the coronavirus.
 - Diabetes: Type 1.5 diabetes, also called latent autoimmune diabetes in adults (LADA), is a condition that shares characteristics of both type 1 and type 2 diabetes. It lies between Type 1 (where the Alpha Cells in the Pancreas do not produce any insulin) and Type 2, where they produce reasonable quantities of insulin but the cell receptors are resistant to its presence. In Type 1.5, the insulin produced is deficient and the receptors are partially resistant.
- Agriculture:
 - The growth in world demand for agricultural products is expected to fall from an average 2.2 percent a year over the past 30 years to 1.5 percent a year for the next 30. The FAO estimates that growth in global demand for agricultural products will fall from an average of 2.2 percent per year over the past 30 years to 1.5 percent a year for the next 30 years.
 - In the USA, one exceptional moment occurred in the decades after the Civil War, when freed slaves and their descendants accumulated 19 million acres of land. In 1910, 14 percent of all farm owner-operators were Black or African Americans. By 2012, however, they comprised only 1.5 percent.
- Bias (racial, gender, etc) in the USA:
 - 1.5 percent of American Psychological Association members are African American.
 - Racial wealth gap: Eight generations later, the racial wealth gap is both yawning and growing. The typical black family has just 1/10th the wealth of the typical white one. In 1863, black Americans owned one-half of 1 percent of the national wealth. Today it's just over 1.5 percent for roughly the same percentage of the overall population. Today, using Wolff's analysis, the median African American family holds a mere 1.5 percent of median white American family wealth.
 - Women manage about 1.5 percent of assets in the financial services industry.
 - It is alleged that 1.5 percent of men are love-shy. About 1.5 percent of American women identify themselves bisexual.
 - It has been found that for women in the top decile of facial attractiveness, their good looks completely negated the 1.5 percent probability boost for female analysts in being voted onto the All-America Research Team

Distance/Height/Length:

- Metres
 - Social distancing of 1.5 meters. Perfumes to keep people 1.5 metres away from you
 - Average human height: 1.5 metres? (*Average human height by country*, Wikipedia)
 - "Double bed": 1.5 metres?
 - Selfies: 1.5 metres (5 feet) is the optimal distance for taking portraits that don't distort your facial features.
 - Personal distance: From 60cm to 1.5 metres (2-5 feet), namely the space is reserved for friends and family - people you know and trust.
- Feet:
 - Sea level rise: The recommended scenarios are 1.5 feet of sea level rise for near-term decisions (2018-2050), 3 feet of sea level rise for medium-term decisions (2050-2080), and 4.5 feet of sea level rise for long-term decisions (2080-2100). At the current rate, the National Oceanic and Atmospheric Administration says sea levels there are rising 4.69 millimetres yearly. That's roughly 1.5 feet in a century.
 - Wave heights as low as 1.5 feet can cause significant damage to structures that are constructed without considering coastal hazards
- Miles / Kilometres:
 - Athletics: Standard 1.5 mile run
- Astronomical distances:
 - Astronomical unit (AU): 1.496×10^{11} metres
 - Distance to the Moon: 1.5 light seconds
 - Distance to Saturn: 1.5 light hours (10.8 AU)
 - "Keep at least 1.5 light years apart to reduce the spread of Vulcan brain worms".

Areas:

- Wildfires: Enormous 'megafire' in Australia engulfs 1.5 million acres
- Farming: 1.5 acres can change an entire community. By increasing our amount of cultivated land to 1.5 acres, we increased our gross sales to \$80,000.

Volumes:

- Litres: A recommendation to avert dehydration is the requirement to drink 1.5 litres of fluids per day. Research indicates that a significant proportion of women who drank 1.5 litres of water per day saw a reduction in wrinkles after 6 weeks without making any other changes to their diet.
- Barrels:
 - Coronavirus quarantine could reduce oil demand by 1.5 million barrels per day.
 - A high profile *New York Times* editorial cited that an estimated 1.5 million barrels of oil equivalent were needed to produce the plastic bottles for annual U.S. bottled water consumption.

Weight/Mass:

- Waste: The average Australian produces approximately 1.5 metric tonnes of waste each year. Each inhabitant of the city of Barcelona generates about 1.5 kilos of waste daily. Each adult produces from 1.3 to 1.5 kilos of urine every day.
- Body Mass Index: Averaging all age groups, BMI tends to increase by 1.5% per decade

Rates:

- Failure rate:
 - Waiting: Each hour of waiting has been independently associated with a 1.5% increased risk of ICU death
 - Space shuttles: That's a 40% vehicular failure rate (updated) and a flight failure rate of 1.5%. A certain type of rocket has a failure rate of 1.5%
- Maintenance: 1.5% Rule for building maintenance budgets
- Species loss ?

Levels:

- Drugs: In the United States, one drink is considered a 12-ounce beer, 5 ounces of wine or 1.5 ounces of 80-proof liquor. Studies have shown that reaction time increases from 1.5 seconds to 3 seconds when blood alcohol content (BAC) reaches 0.08. If it normally takes you 1.5 seconds to react to something, you will be taking 3 seconds to react.
- Sound: Decibels: ?

Time/Cycles:

- Productivity: The average office employee spends 1.5 hours a day (6 weeks per year) looking for things.
- Sleep cycle: A person can get by on 6 or even 4.5 hours of sleep per day without question. The secret is not the amount of sleep, but rather the number itself; a multiple of 1.5 hours will change your life.
- Video games: Chinese children are banned from playing online games for more than 1.5 hours a day
- Chemistry: The half-life of a first-order reaction is 1.5 hours and is independent of the initial concentration of the reactant..

Potentially significant approximations to 1.5 in practice?

To a greater extent than the examples cited above, the question here is what it may be useful to detect in relation to the question raised

here -- and what it is appropriate to exclude. Notable exclusions could naturally include temporary rises or current rates -- where these have little long term significance. The average height of a human being has risen over the past century from a height which could have approximated far more closely to 1.5 metres.

Oscillation: More intriguing are rates and measures which may oscillate around a figure approximating 1.5 -- as with interest rates and rates of inflation -- especially when averaged across a range of countries, as in the case of the OECD group.

Averages: Potentially intriguing is the average height of a human being, given the manner in which this is disguised by the manner of presentation of such information (*Average human height by country*, Wikipedia). The more general point in this respect is that many international statistical tables, notably those relating to human and social development are assiduous in avoiding the provocation which might result from totals and averages.

- Expenditure:
 - Germany will tell NATO in July that it expects to boost military spending to around **1.5 percent** of gross domestic product by 2025,
- Pollution:
 - Contamination limit: The new contamination limit unveiled by China is currently 1.5 percent.
- Risks:
 - In the USA, the lifetime risk of death from drug overdoses is 1.5 percent
- Belief:
 - In the USA, about 1.5 percent of people identify themselves as atheist

Unsustainability and Ponzi schemes: There is the possibility that the [Ponzi scheme](#) pattern is far more general than is readily assumed. There is extensive literature on Ponzi schemes and [pyramid schemes](#), on how to detect them, and when they should be considered illegal (*Pyramid schemes, Ponzi schemes and multi-level marketing*, 2011). The term "Ponzi scheme" is used primarily in the United States, while other English-speaking countries do not distinguish colloquially between this scheme and pyramid schemes.

Less evident, despite such studies, is the extent to which unsustainable development should itself be considered a Ponzi scheme (Shobhana Madhavan and Robert Barrass, *Unsustainable Development: could it be a Ponzi Scheme? Sapiens*, 4, 2011,1). As noted by a surprising number of commentators, consideration can therefore be usefully given to the [global economy](#) as a massive Ponzi scheme in its own right. This then presents the challenge of distinguishing such a scheme from what is so widely promoted as [globalization](#) (*Global Economy of Truth as a Ponzi Scheme: personal cognitive implication in globalization?* 2016). It is not to be imagined that those promoting globalization would clarify how it differs from a pyramid scheme.

Given the dependence on ensuring a continuing flow of investors into the lowest levels of the scheme, in order to sustain the accumulation of wealth at the higher levels, it is intriguing to note that the studies avoid any indication regarding the requisite percentage influx. Does the system remain viable provided the influx ensures a flow in some way related to 1.5? A net profit margin?

As highlighted by the COVID pandemic, how does the viability evaluated by external parties differ from that of participants within a system who depend on it for their livelihood -- a family business, a cooperative, or a subsistence farm?

Is 1.5 in some way the magic number ensuring the viability of any pyramid scheme -- including food chains in the natural environment, especially in predator-prey systems?

The growth of complexity in a pyramid scheme eventually becomes self-limiting, and leads to a wide spread "general systems collapse". As shown by [Thomas Homer Dixon](#), the declining energy returns on investment lead to the collapse of civilizations (*The Upside of Down: catastrophe, creativity and the renewal of civilization*, 2006). Similarly, [Jared Diamond](#) shows that cultures self-limit when they exceed the sustainable carrying capacity of their environment, and the consumption of strategic resources creates a deleterious positive feedback loop that leads eventually to social collapse and technological retrogression (*Collapse: how societies choose to fail or succeed*, 2005).

Clarification of the magic square governing human civilization?

As noted above, having framed 1.5 as a "magic number", there is a case for a speculative focus on one of the most fundamental magic numbers as it features in the simplest [magic square](#) as a [magic constant](#) -- namely 15. This has the potential merit of indicating how the disparate domains governed by 1.5 may be interrelated. Although less common, decimal numbers necessarily also form magic squares and are a feature of early maths education (*Decimal Magic Squares*)

As indicated in the table, a magic square is one in which the columns, rows and diagonals all total to the same amount -- in this case 1.5

Possible indications of a magic square of constant 1.5

	Time	Weight	Volume	↗	1.5
Meters	0.2	0.7	0.6	→	1.5
Degrees	0.9	0.5	0.1	→	1.5
Percentage	0.4	0.3	0.8	→	1.5
	↓	↓	↓	↘	
	1.5	1.5	1.5		1.5

	Growth	Pollution	Error/ Failure	↗	1.5
Human fertility	0.2	0.7	0.6	→	1.5
Global warming	0.9	0.5	0.1	→	1.5
Resource overshoot	0.4	0.3	0.8	→	1.5
	↓	↓	↓	↘	
	1.5	1.5	1.5		1.5

Radical possibility of 1.5 resulting from golden ratio design by committee

Compromise choice by committee? As has become only too apparent in the case of the 1.5 metre separation promoted in response to the coronavirus pandemic, there is no evidence for this particular choice. The number could have been larger or smaller -- but to an undefined proportion. This presumably applies to the 1.5 degrees promoted as a strategic challenge with respect to global warming. Does this conclusion apply to a significant proportion of the other instances of reference to 1.5, as noted above?

In such cases could it be concluded that the world has been faced with a form of "design by committee" especially focused on a memorable number which is neither one nor two? The bodies responsible for such choices could indeed be named -- if only in opting for a compromise in a policy context faced with advice from experts. Would this also apply in the case of decisions regarding interest rates which are so vital to a healthy economy?

As a "magic number". the choice of "1.5" could be recognized as "magical thinking", as variously deprecated:

- David Houle: *A Pandemic of Magical Thinking* (*Futurist*, 16 June 2020)
- François Furstenberg: *The Summer of Magical Thinking* (*The American Prospect*, 14 August 2020)
- Helen Branswell: *The Months of Magical Thinking* (*Stat*, 20 April 2020).
- Mark Shea: *Magical thinking and Trump's Abandonment of America to Pandemic* (*Patheos*, 6 May 2020)

Design-by-committee is a real phenomenon, especially in government projects where a committee of elected representatives establish and control budget decisions, notably as clarified in a survey of engineering efforts that have been heavily influenced by it (*Systems Architecting and the Political Process*, University of Southern California). The problematic process has been articulated in many references with fruitful detail with respect to:

- software design (William Craig, *How to Navigate Design by Committee*, *WebFX*, 6 February 2020; *Design by Committee*, *Source Making*).
- business start-ups (Simon McCade, *How to avoid 'design by committee' and why you should at all costs*, *Medium*, 29 August 2018)
- product design (Heather McCloskey, *10 Smart Ways to Avoid the Consequences of Design by Committee*, *ProductPlan*)

Although no reference is made to "1.5" as such, a related "design by committee" argument has been made with respect to the corporate response to the COVID pandemic (Gabriel Keane, *All Corporate COVID Commercials Are Exactly the Same, Down to the Royalty-Free Piano Music*, *National File*, 20 May 2020).

Golden ratio: The curious possibility, which would typically be neglected by a committee, is the alternative represented by a number like 1.6180339887... It is so close to 1.5 but is clearly unmemorable, if not "irrational" in popular discourse. In a committee context, this would naturally be far better "rounded" to 1.5, as is standard practice in so many accounting contexts and with the use of spreadsheet software. Any effort to communicate 1.6180339887... to the media would have been recognized as laughable.

However, rather than being "unmemorable", 1.6180339887... is in fact the **golden ratio**, otherwise held to be fundamental to beauty as perceived by humans and as variously celebrated in the proportions of nature. By extension it could be recognized as the essence of health -- as might be the case with respect to health of society.

The golden ratio is also apparent in angular measure as the **golden angle** of 137.50776405... degrees. There is an ironic absurdity to the "numerological addition" of the two numbers -- a trivial coincidence from most perspectives. The total of the golden ratio (1.618034) and the golden angle (expressed as 1.37507764) is 2.993111. An "average, would then give 1.5, almost precisely. Is the focus on 1.5 equally absurd in the current global context?

Proportions: In the quest for meaningful proportions in a society riven by inequalities and disproportion, the irony is also the greater in that 1.6180339887... is also known as the "golden mean".

The **golden ratio is appreciated as a proportion -- not as a number** which is an obvious challenge to memory and communication. It is appreciated **as a proportion expressed otherwise**, most notably in architecture and design. Is there a need to think otherwise with respect to the strategic challenges to which committees have responded with "1.5"?

The golden ratio is especially appreciated in the proportions of the human body -- however numbers are attributed to them, even 1.5

Thus:

- women from all cultures repeatedly indicate a preference for a shoulder-to-waist ratio in which the circumference of the body at the shoulders is 1.6 times bigger than that at the waist. This is held to derive from the role of the golden ratio
- the ideal waist size is the product of yet another ratio, which is the height-to-waist ratio, typically 45% of the height. This figure is a derivative of the golden ratio using the reciprocal of the square root of five -- with a result of 1.447. The golden ratio for a woman's body measurements are held to be probably somewhere in the range 1.3 to 1.5.
- the arguments with respect to the role of the golden ratio, and approximations to it, are discussed at some length with respect to appreciation of beauty in the human face (Gary Meisner, *The Golden Ratio, Beauty and Design: It's time to 'face' the facts*, *Golden Number*, 9 November 2015)

The current emphasis for social distancing on "1.5 metres" offers another twist to the argument, given the purported equivalent of "6 feet" as promoted in English-speaking countries such as the USA -- although "6 feet" is in fact 1.8288 metres. The origin of the [foot as a unit of measurement](#) is a reflection of human-scale measurement which has been completely lost in the [international definition of a metre](#). Ironically the arithmetic mean between 1.5 and 1.8288 is 1.6644, notably closer than either to the golden mean of 1.61803.

Golden ratio as an alternative to 1.5? How would the engagement with global challenges be transformed if the golden ratio were to be used as humanity's magic number?

- whatever the justification for social distancing, how much more elegant would be its communication, acceptability and uptake if it were framed by the golden ratio? This would be especially the case if presented in terms of average human height.
- would the acceptability of the challenge of global warming, and its effect on the environment, be understood quite otherwise if it were framed by that ratio?
- how might economics be transformed if interest rates were presented in proportions governed by the golden ratio, rather than by the inhuman sterility of accounting measures? This would be especially relevant given the extent to which it already features in market trading practices.

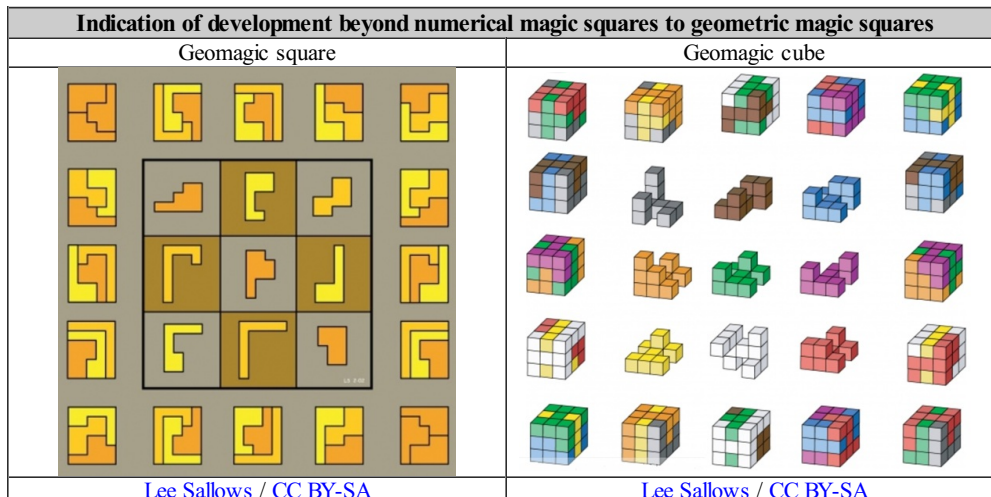
Geometric magic squares: A provocative mnemonic use is made of the simplest magic square above to suggest further insight into 1.5 as a magic constant. However any suggestion that such a magic square should be adapted following substitution of the golden ratio reframes the challenge completely -- and appropriately so.

It would seem that **there is a need for a "language of proportion" which is required to render credible the challenges faced by humanity -- especially if these constitute issues of proportion.** Numbers as currently used are readily recognized as an inappropriate language for that purpose. How is "proportional thinking" to be developed, as suggested by the Reanaissance thinking and by the preoccupation of early education in mathematics (Vasco Zara, *Music, Architecture, Proportion and the Renaissance Way of Thinking*, *European Review*, 2020; Annette Hilton, et al, *Using photographic images to enhance conceptual development in situations of proportion*, *APMC*, 20, 2015, 1)?

As succinctly stated with respect to the Ebola pandemic of the past by Simon Jenkins: *We have lost control of the language of proportion. The result is an outbreak of crying-wolf syndrome (Downing Street's Ebola panic is a classic case of the politics of fear, The Guardian, 17 October 2014)*

It so happens that the concept of a magic square as studied over millennia has been fruitfully reframed in the recent past into a geometric analogue by Lee Sallows (*Geometric Magic Squares, Mathematical Intelligencer*, 33, 2011, 4; *Geometric Magic Squares: a challenging new twist using colored shapes instead of numbers*, 2013). They offer a new way of perceiving the integration which magic squares have traditionally implied (Alex Bellos, *Magic squares are given a whole new dimension, The Observer*, 3 April 2011).

Such [geometric magic squares](#) are now recognized as a generalization of their traditional numeric forms which are in effect specific instances of the new geometric formulation. A geomagic square is a square array of geometrical shapes in which those shapes appearing in each row, column, or diagonal can be fitted together to create an identical shape -- the target shape. Shapes of any dimension are possible. The richer structure of geomagic squares is reflected in the existence of specimens showing a far greater degree of 'magic' than is possible with numerical types.



The image on the right is itself indicative of a new way of thinking about the UN [Sustainable Development Goals](#), as an extension of an earlier argument in relation to the Rubik Cube (*Interplay of Sustainable Development Goals through Rubik Cube Variations Engaging otherwise with what people find meaningful*, 2017).

Arguably in seeking a comprehensible golden ratio refinement for 1.5, use could be made of its expression in the form most readily recognized, namely the [golden rectangle](#), as it might apply to a geometric magic square. In 3D, this is most obviously related to polyhedra.

Golden ratio and geometric magic squares: The argument can however be developed further in the light of the presentation by James Solberg (*(Phi)ve is a Magic Number*, 2018; *(Phi)ve is Magic*, YouTube, 2018). He specifically addresses the correspondence between the number 5 at the centre of a conventional magic square and that of the golden ratio in the form of 1.6180. He demonstrates that the two numbers are linked in many surprising ways as clarified by geometric magic squares (James J. Solberg, *Easy Magic Square Methods and Tricks*, 2019). With respect to the argument here, it is also appropriate to note Solberg's professional responsibility with respect to operations research (*Modeling Random Processes for Engineers and Managers* 2008).

There is every possibility that development of applications in this regard could include insights from [magic circles](#) -- and the possibility of the requisite adaptation of conventional accounting, as separately argued (*Spherical Accounting: using geometry to embody developmental integrity*, 2004). Magic circles have for example been adapted to spherical form -- with the possibility that these may be especially relevant to global governance.

In quest of a language of proportion as the language of appropriateness

The exercise above was provoked by the seemingly unquestionable enthusiasm for "1.5" in a range of domains. Noted as a work in progress, the methodology calls for careful refinement if the argument is to be more than a simple provocation for some or otherwise irrelevant.

Especially problematic is how 1.5 might be usefully compared with the golden ratio of 1.618.... given that units and percentages may be variously associated with the first and that it is a unit-less proportion which is associated with the second. Any comparison could be readily understood as nonsensical, although careful reflection might possibly suggest otherwise. **Is there value, for example, to their comparison for mnemonic purposes and for the kinds of communication required for widespread credibility in the face of the challenges of governance?**

There is no lack of references to a language of proportion. Unfortunately, but perhaps indicatively, these tend to be closely related to aesthetic appreciation, whether in terms of architecture, music or the proportions of the human body. There is seemingly a questionable disconnect with the language of percentages favoured by statisticians, accountants, and the policy-makers they tend to serve. That said, there is no lack of guidance to students of mathematics on the relation between percentages, proportions and ratios. Missing is however the credibility of information presented via one mode rather than another.

The point has been succinctly expressed in parliamentary debate with a distinction made between the "language of priorities" and the "language of proportion". It is the language of priorities which tends to engender approximations like 1.5 -- avoiding the subtleties of the golden ratio. This suggests that the language of priorities offers advantages with respect to short-term response. Paradoxically it is the language of proportion which IS more closely associated with long-term uptake -- on which widespread response to issues like climate change may be especially dependent.

Translating of percentages into proportions: A valuable literature review is provided by Ben Wilbrink (*Measurement: annotated references*, 2016), noting in particular the work of John James Roche (*The Mathematics of Measurement: a critical history*, 1998) and that of Denny Borsboom. *Measuring the Mind: conceptual issues in contemporary psychometrics*, 2005). As Wilbrink notes *Deep problems are involved in the concept, also in practical issues regarding achievement testing*. These are all the more relevant in a period in which numbers like 1.5 feature in the array of ways in which public opinion is susceptible to manipulation.

Wilbrink also points out that:

The Greek tradition of using proportions obviates the need to standardize lengths, times, etcetera; no effort was expended in standardizing, until in the eighteenth century, and the French Revolution offering the opportunity to enforce national standards in the economy at large. In particular, in the Greek tradition, it was highly unusual 'measure' entities by assigning numbers to them according to some procedure.

For Roche (1998), with respect to the language of proportion:

The model of magnitude used in the more rigorous versions of this tradition was the non-metric geometrical length known directly, and not the magnitude measured numerically. Lengths, and other magnitudes such as weight and time are, therefore, assumed to be known through a direct sensory encounter with the quantity concerned rather than by numerical measurement. (p. 47)

Misleading humanity with percentages? Is there a case for recognizing that percentages misrepresent the strategic challenge faced by human civilization, as usefully implied by the study of Stephen Jay Gould (*The Mismeasure of Man*, 1981)? As argument of this kind would accord with the frequent reference the ease with which duplicity can be promoted using statistics -- *Lies, damned lies and statistics* (Darrell Huff, *How to Lie*, 1954; Peter M. Lee, *Lies, damned lies and statistics*, 2017).

It can be argued that the widespread tendency to present the many periodic reports on the global condition in static terms is a distortion of understanding of a dynamic system (*Dynamic Transformation of Static Reporting of Global Processes: suggestions for process-oriented titles of global issue reports*, 2013).

Of particular relevance is the manner in which statistics are variously "massaged". As argued by *The Economist*: When governments try to control everything, they end up massaging statistics and deluding themselves (*Self-deluding governments*, 15 December 2015). It is less evident how the language of proportion might lend itself to such processes or to their mitigation.

Communication of disproportion: A key to more appropriate understanding may lie in the sense of disproportion and excess -- a sense that is neutralised by the use of numbers and percentages. Striking examples are offered by:

- wealth: notably in the light of frequent references to the "top 1 percent" and how it served as a rallying cry for the Occupy Movement.
- growth: notably in the light of a seemingly requisite rate of growth in GDP, the threat to economic health if it is not maintained, and the challenge this implies for the rapid depletion of resources framed as overshoot
- representation: notably with respect to the under-representation in terms of gender or minorities -- equality 1:1 1%tp
- height
- misinformation: fake news / / puffery / truth to puffery
- population growth: sub-fertile replacement
- justice criminality / sentencing

Adaptation of the Uncertainty Principle to the social sciences?

There is no lack of references to the challenges of uncertainty faced by global governance, given a degree of probability of collapse in one or more forms. The COVID pandemic offers but one example.

Of interest therefore is the potential relevance of an adaptation of the mode of thinking which gave rise to the oft-cited [Uncertainty Principle](#) of fundamental physics and quantum mechanics. The possibility of some such adaptation is usefully framed by the argument of [Alexander Wendt](#) (*Quantum Mind and Social Science: unifying physical and social ontology*, 2015). The question here is framed as a matter of perception, namely how percentages are perceived in contrast with proportions. Expressed otherwise, **is there some principle of uncertainty which governs the relation between percentages and proportions as comprehended?**

Some such possibility seems to have been initially raised by Garrison Sposito (*Does a generalized Heisenberg principle operate in the social sciences? Inquiry: An Interdisciplinary Journal of Philosophy* 12, 1969, 1-4). It has been dismissed by Andrew Zimmerman Jones (*Understanding the Heisenberg Uncertainty Principle ThoughtCo*, 2018):

Heisenberg's uncertainty principle is one of the cornerstones of quantum physics, but it is often not deeply understood by those who have not carefully studied it. While it does, as the name suggests, define a certain level of uncertainty at the most fundamental levels of nature itself, that uncertainty manifests in a very constrained way, so it doesn't affect us in our daily lives. Only carefully constructed experiments can reveal this principle at work.

Relevant cautions have been articulated by Wolff-Michael Roth (*Heisenberg's uncertainty principle and interpretive research in science education*, *Journal of Research in Science Teaching*, 30, 1993, 7):

Within the current methodological debate, notions successful in the natural sciences are rallied by social sciences researchers to support their own methodological approaches. However, problems of understanding the physical principles have often clouded the issue. One such notion under discussion is Heisenberg's uncertainty principle and the derivative notions of indeterminacy, uncertainty, precision, and observer-observed interaction. This article discusses these notions and their applications to social science research. Implications are drawn for research in science education.

A degree of credibility has however been argued in relation to the current pandemic by Ben Klemens (*The Heisenberg Uncertainty Principle of Social Science Modeling*, *Scientific American*, 7 July 2020)

But as the number of things we're trying to study grows, the chance of getting even close to the target reality falls. The reason for this trade-off is the "curse of dimensionality." It is not a rule of thumb or a limit due to measurement errors, but as much a mathematical fact as the Pythagorean theorem -- and it puts fundamental limits on what economics and other social sciences can describe. The curse of dimensionality is why our estimates of how a disease will behave will always have imprecision.

A specific proposal has been made by Ravi Kashyap (*The Uncertainty Principle of the Social Sciences*. SSRN, 2014):

Inspired by the Heisenberg Uncertainty Principle for sub-atomic particles in Quantum Mechanics, we postulate the Uncertainty Principle of the Social Sciences as follows: Any generalization in the social sciences cannot be both popular and continue to yield accurate predictions, or in other words, the more popular a particular generalization in the social sciences, the less accurate will be the predictions it yields.

When we compare the central tenets of the two principles, a striking commonality emerges. This has to do with how each system is affected by efforts at increasing the accuracy of measurements for one variable, resulting in decreased accuracy in knowing the other variable.

The Uncertainty Principle of the Social Sciences, thus stated, in terms of popularity and accuracy of predictions, primarily deals with the scope and limitations of any relationships we uncover in social systems. We lay the groundwork for a theoretical framework towards measuring and understanding the Uncertainty Principle of the Social Sciences. Two elements seem to immediately contribute towards this uncertainty; one is the number of participants in the social system and the other is the number of possible states the predicted outcome can take. The simplifying assumption here is that we can identify all the possible predicted outcomes and participants unambiguously.

Particular attention has been given to the controversial measurement of the [impact factor](#) of published academic texts (Peter W. Michor *Uncertainty Principles in Social Sciences* 2017; Douglas N. Arnold and Kristine K. Fowler, *Nefarious Numbers*, *Notices of the AMS*, 58, 2011, 3).

Consideration of wider implication is evident from Ted P. Temzelide, who argues that

We provide a model of the experimental process in the social sciences by adapting the symbolism developed for modeling experiments in atomic physics... An uncertainty principle imposes a fundamental limit on the observer's ability to extract detailed information about two distinct attributes within a short period of time. (*An Uncertainty Principle for Social Science Experiments SSRN*, 2006)

Further indications are offered by Robert F. Bordley:

A key central tenet of decision theory is that decomposing an uncertain event into sub-events should not change the overall probability assigned to that uncertain event. As we show, both quantum physics and behavioral decision theory appear to systematically violate this principle in very similar ways. These results suggest that the structuring phase of decision analysis -- which specifies how various events are decomposed -- helps shape the subjective probabilities which will ultimately be assigned to those events. (*Quantum Mechanical and Human Violations of Compound Probability Principles: Toward a Generalized Heisenberg Uncertainty Principle Operations Research*, 46, 1998, 6)

Rather than focus on the Principle of Uncertainty as constrained by the intricacies of quantum mechanics, there is a case for recognizing the problematic uncertainty which is associated with distinct models upheld as descriptive of social reality as perceived. This could be most fruitfully recognized in the case of distinct paradigms and **the cognitive challenges of shifting between paradigms**. Quantum mechanics offers the obvious example of a particle description versus a wave description, each recognized as adequate explanations for certain purposes.

So framed it could then be said that **the language of percentages and the language of proportion are complementary**. The challenge then lies in the nature of the "cognitive twist" in shifting between them and the uncertainty with which this is associated (*Clarifying subtle complexity and a necessary "cognitive twist"*, 2019; *Configuring a focus for awareness through a cognitive twist*, 2015). **The relative simplicity of the mathematical transformation between the two languages distracts from the confusion in thinking in one mode rather than in the other.**

Arguably the challenge epitomized by any context characterized by binary alternatives, whether politics or otherwise, lies in the art of shifting between worldviews in order to acquire the depth of a form of cognitive stereoscopic vision (*Living as an Imaginal Bridge between Worlds: global implications of "betwixt and between" and liminality*, 2011).

With respect to such a paradigm shift between alternative explanatory models, it could prove appropriate to adapt the oft-quoted assertion of [Richard Feynman](#): *If you think you understand quantum mechanics, you don't understand quantum mechanics*. Most obviously the nature of this shift in perspective applies to any form of "conversion", as between left and right-wing political parties. It is somewhat ironic in the context of this argument to note, for example, the oft-quoted assertion of [Aneurin Bevan](#) that: *The language of priorities is the religion of socialism*.

Language of proportion implied by poetic justice

Curiously it is aesthetic sensibility which offers clues to comprehension of the paradoxical cognitive twist between radically contrasting explanatory frameworks. This is perhaps most usefully clarified by the recognized sense of [poetic justice](#) -- in contrast to more conventional understandings of justice.

Given the excesses practiced so enthusiastically by humanity on a global scale, the collapse of global civilization could be fruitfully explored in terms of poetic justice, as with the collapse of empires past in defiance of the logic which had enabled them so effectively. Unfortunately, the argument can of course be focused on those individuals considered most blameworthy, thereby avoiding any focus on

those who empowered them through the social processes in which they are complicit:

- John Rubino: *Poetic Justice Coming For The 1%*, (*DollarCollapse*, 13 February 2020)
- Mark Shupe: *Facing A Mindless Assault on Capitalism, George Reisman Defends the Mother of All Poetic Justice*, *Center for Individualism*, 15 July 2020)
- Earl P. Holt III: *Poetic Justice* (*Conservative Headlines*, 22 January 2020)
- Craig J. Cantoni: *Poetic Justice Goes to College* (*Journal of American Physicians and Surgeons*, 20, 2015, 4)
- Pepe Escobar: *Poetic Justice of a Green Revolution* (*The Unz Review*, 12 June 2009)
- W. J. T. Mitchell: *Poetic Justice: 9-11 to Now* (*Critical Inquiry*, 1 September 2011).

As with other disasters, is the coronavirus pandemic to be usefully recognized as an instance of poetic justice -- whether divinely enabled or by the dynamics of Gaia?

Physics is much challenged by the role of the observer in any measurement process. As a proportionate response, is any measure of poetic justice to be especially recognized as determined to a poorly understood degree by the "eyes of the beholder" through which "comeuppance" is appreciated (Blakey Vermeule, *A Comeuppance Theory of Narrative and Emotions*, *Poetics Today*, 32, 2011, 2)?

Especially valuable with respect to poetic justice are the insights offered by the traditional fables of many cultures, as argued separately (*Proportionate Response in the Eye of the Beholder: educational fables for faith-based global governance*, 2006). The argument includes sections on:

Challenge for the beholder	Proportionate response, degrees of complicity and collateral damage
Acclaimed disproportionality	Proportionate response vs Proportional responsibility
Reframing proportionate response	Challenge of existential maturity and sense of identity
Certification of disproportionality	Proportionate response from other perspectives
Contemporary reformalization of ritual "human sacrifice"	

Given the manner in which the [Four Horsemen of the Apocalypse](#) have been variously depicted, there is some irony to the possibility that their depiction has cognitive implications. Understood as four languages of disproportion, this can be speculatively explored (*Beware of Legality, Accountability, Marketability, Security! Be where the Four Hoarsemen of the Apocalypse are not?* 2012).

The contrast between proportion and disproportion in policy-making lends itself to exploration from a poetic perspective (*Poetry-making and Policy-making: arranging a marriage between Beauty and the Beast*, 1993; Amy Mount, *Policy needs Poetry: what the humanities bring to policy making*, *Green Alliance*, 29 April, 2015).

This could be recognized as of considerable relevance to the problematic engagements with cultures which attach significance of a higher order to the role of poetry (*Poetic Engagement with Afghanistan, Caucasus and Iran: an unexplored strategic opportunity?* 2009; *Strategic Jousting through Poetic Wrestling: aesthetic reframing of the clash of civilizations*, 2009; *Strategic Dialogue through Poetic Improvisation: web resources and bibliography*, 2009).

Deflowering of civilization versus Flowering of civilization: an aesthetic contrast?

The evolution of empires is readily framed in aesthetic terms as the "flowering of civilization". Clearly this would suggest the merit of appreciating their decline as a process of "deflowering". This is especially highlighted by the invasion and destruction of cultures and of the environments in which they have thrived. There is no lack of metaphorical references to the rape of cultures and societies -- consistent with one challenging sense of deflowering. The contrast can be explored in terms of a disruption of some form of experiential "flow", which may be associated with any sense of the particular "magic" of a culture (*Flowering of Civilization -- Deflowering of Culture: flow as a necessarily complex experiential dynamic*, 2014).

This flow may be explored as a sustaining dynamic. One insight is offered by the preoccupation of "internal alchemy" (*Neidan*), purportedly used by Taoist initiates to prolong life and create an immortal spiritual body that would survive after death. This is held to involve an appropriate "circulation of light", as being essential to sustaining health (*Circulation of the Light: essential metaphor of global sustainability?* 2010).

This has been presented as comparable to the "spiritual alchemy" of the West, but is the focus of the Chinese classic *The Secret of the Golden Flower*. It is the essential nature of the dynamic which makes of it an open secret -- whose very openness is a challenge to any comprehension in quest of closure. As a challenge in topology, new consideration of alchemy in relation to the closure of death has been presented by [Steven M. Rosen](#) (*Dreams, Death, Rebirth: a multimedia topological odyssey into alchemy's hidden dimensions*, 2013).

How this applies to collectivities, especially a global knowledge-based civilization, has yet to be explored.

Given the emphasis in this argument on the golden ratio, there is a case for careful exploration of how this manifests in flowers, as highlighted by [Keith Critchlow](#) (*The Hidden Geometry of Flowers: living rhythms, form and number*, 2011; *The Mystery of Flowers: the sacred geometry of plants*, *Resurgence*, 272, May/June 2012).

The flowering of civilization might be "fruitfully" compared with the [golden angle in nature](#), *Wikipedia*):

The golden angle plays a significant role in the theory of phyllotaxis; for example, the golden angle is the angle separating the florets on a sunflower. Analysis of the pattern shows that it is highly sensitive to the angle separating the individual primordia, with the Fibonacci angle giving the parastichy with optimal packing density. Mathematical modelling of a plausible physical mechanism for floret development has shown the pattern arising spontaneously from the solution of a nonlinear partial differential equation on a plane (*Sunflowers and Fibonacci: models of efficiency*, *Irish Times*, 5 June 2014)

Is the flowering of civilization in some way to be understood as the unconscious collective adoption of a model of efficiency to be usefully understood in such terms as a language of proportion? By contrast, is any deflowering to be understood as the adoption of a distinctive model of efficiency, readily to be compared to that associated with the language of percentages? The former would clearly lend itself to appreciation in poetic terms, recognizable in the extensive appreciation of flowers in poetry. The intimate relationship between flower appreciation, arrangement, poetry, and the strategies of the martial arts is evident in the complex of *ikebana*, *haiku* and *bushido* within Japanese culture -- exemplified by *mono no aware*, namely an awareness of impermanence which merits application of civilization.

The flower metaphor suggests the possibilities that the projects of an institution might be recognized as arrayed for greatest efficiency like the petals of a flower. An indication in this respect is the Java platform [Petals ESB](#) based on SOA principles to interconnect heterogeneous systems, applications and services. It acts as a mediation and a communication layer in an information system. Other examples are the use of the Fibonacci sequence as a means of ordering projects (Madhurima Das, *Estimating Agile Projects: the Fibonacci way*, *Training Crossroad*, 29 October 2019; Robert Velasquez, *What Is The Fibonacci Sequence? And How It Applies To Agile Development*, *eLearning Industry*, 2 October 2017).

An alternative example from nature, recognized as governed by the Fibonacci spiral, is the shell of the marine nautilus -- long admired for its elegant symmetry. The relation of that pattern to psychosocial development is the justification for its use as the primary symbol of the New Zealand educational curriculum (*The Curriculum Nautilus*) -- originally framed as a metaphor for growth by Oliver Wendell Holmes. It is in that spirit that it features in the name of the Pacific-based [Nautilus Institute for Security and Sustainability](#). Given the specificity in both institutional contexts, the question is how that spiral of insight can be associated with any sense of the phases in the flowering of civilization -- or in its deflowering as explored below.

The argument has been further developed separately (*Fibonacci Spiral in 3D Framing Psychosocial Phyllotaxis: articulation of global governance through the language of flowers?* 2020).

Spiral of silence and the associated "conspiracy" of silence

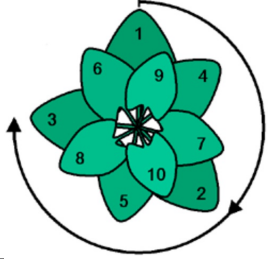
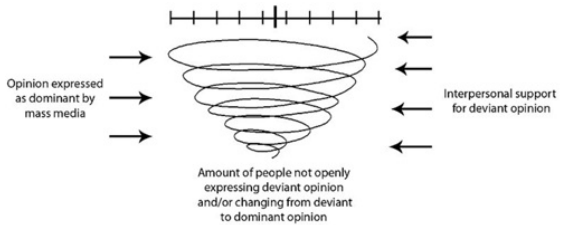
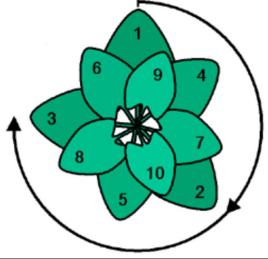
Of potential relevance to any process of deflowering civilization -- and its eventual collapse -- is exploration of the manner in which disasters might also develop according to that pattern (Furkan Semih Dündar, *Covid-19 and the Fibonacci Numbers*, *ResearchGate*, March 2020).

Potentially even more relevant is the extensive literature on the [spiral of silence](#), as a political science and mass communication theory, first articulated by Elisabeth Noelle-Neumann (*The Spiral of Silence: public opinion -- our social skin*. University of Chicago, 1984; *Turbulences in the Climate of Opinion: methodological applications of the spiral of silence theory*, *Public Opinion Quarterly*, 41, 1977, 2). According to the latter:

- The model begins with individuals' inherent desire to blend with society. The fear of social isolation is necessary for the spiral to occur.
- Individuals who notice that their personal opinion is spreading will voice this opinion confidently in public. On the other hand, individuals who notice that their opinions are losing ground will be inclined to adopt a more reserved attitude when expressing their opinions in public.
- Representatives of the spreading opinion talk quite a lot while the representatives of the second opinion remain silent. An opinion that is being reinforced in this way appears stronger than it really is, while an opinion suppressed will seem to be weaker than it really is.
- The result is a spiral process which prompts other individuals to perceive the changes in opinion and follow suit until one opinion has become established as the prevailing attitude while the other opinion will be pushed back and rejected by most. The end of the [spiral](#) refers to the number of people who are not publicly expressing their opinions, due to the fear of isolation.

This is a model of why people are unwilling to publicly express their opinions when they believe they are in the minority. Expressed otherwise, the model is based on three premises:

- people have a "quasi-statistical organ", a sixth-sense which allows them to know the prevailing public opinion, even without access to polls,
- people have a fear of isolation and know what behaviours will increase their likelihood of being socially isolated, and
- people are reticent to express their minority views, primarily out of fear of being isolated.

Flowering of civilization: golden angle array of petal formation	Elisabeth Noelle-Neumann's Spiral of Silence	Deflowering of civilization: golden angle array of petal loss
		

The spiral array of "petals" emerging in any flowering process could indeed be related to distinctive initiatives or projects of an organization or society. With respect to the spiral of silence, **the vital question is the spiral array of constraining or repressive measures significant to the deflowering process -- perhaps to be recognized as a progressive loss of "petals"**. As "curling up", the process could be considered reminiscent of the **compactification** of "extra dimensions" as articulated by physics. Experientially it recalls the **dimensional reduction** of that context.

The theory of a spiral of silence has evoked extensive commentary as well as being the subject of controversy and criticism, notably in Germany (as its country of origin):

- Andy Valeri: *The Spiral of Silence* (University of Dayton, 2008)
- Edward Maibach, et al: *Is There a Climate "Spiral of Silence" in America?* (*Climate Change Communication*, 29 September 2016)
- Sushmitha Hegde: *What Is The Spiral Of Silence?* 2 March 2020)
- J. D. Kennamer: *Self-serving biases in perceiving the opinions of others: implications for the spiral of silence* (*Communication Research*. 17. 1990, 3)
- P. Moy, et al: *The spiral of silence and public opinion on affirmative action* (*Journalism and Mass Communication Quarterly*. 78, 2001, 1)
- A. F. Hayes: *Exploring the Forms of Self-Censorship: on the spiral of silence and the use of opinion expression avoidance strategies*(*Journal of Communication*. 57, 2007, 4)
- Kyoungtae Nam: *The Effect of Personality on the Spiral of Silence Process* (University of Tennessee 2002)
- David A. Askay: *Silence in the Crowd: the spiral of silence contributing to the positive bias of opinions in an online review system* (*New Media and Society*, 17, 2015, 11)
- L. W. Jeffres, et al: *Spiral of Silences: expressing opinions when the climate of opinion is unambiguous* (*Political Communication*, 16, 1999, 2)
- K. Neuwirth: *The Spiral of Silence and Fear of Isolation* (*Journal of Communication*, 57, 2007, 3)
- J. Matthes: *Observing the "Spiral" in the Spiral of Silence* (*International Journal of Public Opinion Research*, 27, 2014, 2)
- Xin Jin and Qianying Ye: *Spiral of Silence: a powerful perspective of understanding the public opinion* (*ResearchGate*, December 2018)
- L. Perlow and S. Williams: *Is silence killing your company?* (*Harvard Business Review*, May 2003).
- *Germany Struggles To Define Limits of What Can Be Said* (*Der Spiegel*, 8 November 2019)

With respect to the COVID pandemic, it is the future which will be able to document the stages in the repression of freedom of expression under pressure to conform to mainstream presentation of appropriate strategic response. Ironically this can be seen as resulting in a form of cognitive lockdown isolating those with alternative perspectives. The progression is remarkably articulated by the tragic comment by [Martin Niemöller](#),

When they came for the Communists, I did not say anything. I was not a Communist.
When they came for the trade unionists, I did not say anything. I was not a trade unionist.
When they came for the Jews, I did not protest. I was not a Jew.
When they came for the Catholics, I did not protest. I was not a Catholic.
Then they came for me. And there was no one left to protest.

Given the presentation as a spiral, it is however curiously rare to find any consideration of the manner whereby it might be governed by the spiralling Fibonacci series, or any mention of the golden ratio. Ironically this could even be caricatured as a "conspiracy" consistent with the theory. The use of spiral is seemingly purely metaphorical, despite the articulation offered by [phyllotaxis](#) (Takuya Okabe. *Biophysical optimality of the golden angle in phyllotaxis*, *Scientific Reports*, 5, 2015, 15358).

Could the golden angle then be explored in terms of "sociophysical optimality" in collective communication? Is there a sense in which those expressing distinctive perspectives are best positioned at such an angle to each other, as at any negotiation table -- neither opposite, nor side by side? How might such configuration enable or diminish the operation of a spiral of silence?

In the recognition of stages in psychosocial [spiral dynamics](#) (and its relation to [integral theory](#)), there is however a similar lack of reference to phyllotaxis, if only as a metaphor offering an exceptionally detailed pattern of articulation -- "petal stages" or "petal phases"? There is clearly a case for relating any spiral of evolutionary development to a reverse spiral of repressed expression, especially if the metaphor is extended to recognition of deflowering and compactification as a precursor of fruit and seed formation. This would be consistent with recognition of a complementary role to the enlightenment characteristic of cultural flowering ([Enlightening Endarkenment: selected web resources on the challenge to comprehension](#), 2005).

Mysterious challenge of doubling, replication and multiplication

As noted above, the relation between the language of percentages and the language of proportion is challenging when recognized in terms of comprehension and communication. The relation is however trivial when it is understood as a matter of "mathematical mechanics" -- which then obscures the nature of the challenge to comprehension. So it can be said of a particle understanding of reality -- obscuring its fundamental nature as waveforms.

The challenge can be highlighted by the manner in which the language of proportion implies a larger context in relation to which any

proportion is significant. This is effectively denatured or denied by the relation to 100 in the language of percentages -- with 100 as merely indicative of a whole from which existential connotations have been abstracted.

The argument can be developed in relation to any sense of excess or dearth. The language of proportion then highlights these inadequacies in relation to a larger systemic context in which such disproportion is dysfunctional. The language of percentages offers no such implication. Thus critical statements regarding the top 1% carry relatively little significance in systemic terms.

That argument can be extended in relation to "doubling" as upheld as highly desirable with respect to the development of sales, profits, GDP, and the like (Marc Wayshak, *The Mathematical Formula to Doubling Your Sales Without Working More*, HubSpot, 2017; Tim Stokes, *How to Have Your Own Business Growth Plan to Double Your Profits*, 2020; Clifford G. Gaddy, *Doubling GDP and the Illusion of Growth*, Brookings, 12 November 2003).

Given the seeming absence of recognition of how the spiral of silence (or its reverse) might be governed by the Fibonacci series and the golden angle, it is most ironical to note the manner in which the latter have been taken up as [Fibonacci retracements](#) in analysis of trading on the financial markets in the quest for profit, and the possibility of doubling them (Jasvind Singh, *The Golden Ratio in Trading*, PhillipCFD, 10 August 2017; Dan Blystone, *Strategies for Trading Fibonacci Retracements*, Investopedia, 11 May 2020; Emily Kotow, *The Magic of Fibonacci Retracement*, HedgeTrade, 19 September 2019). Why does analogous thinking not feature in any form of social investment?

The assumption that "doubling is good" is consistent with the Wall Street slogan that "greed is good" (Kimberly Amadeo, *Greedy Is Good or Is It? Does greed "Capture the Essence of the Evolutionary Spirit?"*, ThoughtCo, 21 August 2020). However the slogan ignores the strategic trap insightfully recognized as: *Having lost sight of our objectives, we redouble our efforts.*

Such doubling, as a feature of an uncritical capitalist mindset (for example), is now recognized as having resulted in a situation in which human civilization effectively requires more planets to survive -- as highlighted on the occasion of [Earth Overshoot Day](#) (*Number of planet Earths we need to provide resources and absorb our waste, right now*, The World Counts). The language of percentages is indifferent to such excess.

The confusion is potentially highlighted by the question of whether it is two languages that require some form of conciliation of more. With the language of priorities acclaimed as the religion of socialism, would capitalists also lay claim to that religion in any focus on doubling profits? For Rob Long:

The language of priorities disguises the social reality or fluctuating, movement (learning) and adaptable human living. The messiness of human living shifts priorities in context constantly and this is the maturity of wisdom (*The Language of Priorities*, SafetyRisk, 6 December 2018)

The apparent simplicity of the argument obscures the cognitive factors which enable its import to be denied or ignored in practice. This has been variously explored in relation to [denialism](#), as evident in the case of climate change and other issues. It is otherwise evident in the paradoxical nature of quantum mechanics as the acclaimed description of reality. There is therefore a case for exploring the mystery of reproduction within a theological framework, although its nature as a mystery was the title of an international symposium (*The Mystery of Reproduction Strategies*, University of Debrecen, 2019).

Appropriate indication of the mystery is provided in biblical terms valued by the Abrahamic religions. It is encapsulated in [Genesis 1:28](#) in the injunction to: *be fruitful and multiply* lending itself to a range of opportunistic interpretations, as discussed separately ("*Be Fruitful and Multiply*": *the most tragic translation error?* 1995). As noted in the latter:

For the individual and the family, there are a number of well-recognized reasons to seek to build up a family. Personal security in later years and the need for labour on the family land are not the least of them for subsistence farmers the world over.

More questionable is the tendency of the major religions to encourage large families. The cynical would argue that this is an easy policy whereby the numbers of the faithful can be increased with little investment in missionary activity. But the faithful are reassured by holy scripture and notably, for the people of the Book, by the key phrase "be fruitful and multiply"

Explored otherwise, is risk enhanced by simplistic reliance on basic mathematical operations, as argued separately (*Risk-enhancing Cognitive Implications of the Basic Mathematical Operations: Add, Multiple, Divide, Subtract*, 2013). There is a case for developing the discipline and focus of mathematical theology -- however it is to be distinguished from the more questionable aspects of numerology (Hitoshi Ochiai, *Mathematical Theology*, Sekaishisoshia, 2009; Sarah Voss, *Mathematical Theology*, UU World, 2003; Gregory Benford, *Applied Mathematical Theology*, Nature, 440, 2006; J. R. Lucas, *Mathematical Theology*, Oxford Scholarship Online). The argument has been presented separately (*Mathematical Theology: Future Science of Confidence in Belief -- Self-reflexive Global Reframing to Enable Faith-based Governance*, 2011).

Just as particle physics and waveforms may be recognized as mutually contradictory, it can be argued that there is a fundamental contradiction in the language of [sub-replacement fertility](#) in a context of ever increasing constraint on global resources. The language of proportion enables a degree of recognition of the disproportionality of pursuing replacement at all costs. However from a local perspective no such constraint is recognized in the quest for increased family size and the population increase required to sustain the Ponzi scheme of unsustainable development. This inherent contradiction is an aspect of that relating overcrowding and overpopulation (*Local Reality of Overcrowding -- Global Unreality of Overpopulation*, 2019).

That the biblical injunction might be understood otherwise is indicated through allusions typical of Taoism: *The Tao generates the One*,

the One generates the Two, the Two generate the Three, the Three generate the ten thousand things (*Tao Te Ching*, 42). From a Talmudic perspective, the mystery of doubling is encoded in the first verse of Genesis (Elliot Wolfson, *Alef, Mem, Tau: kabbalistic musings on time, truth, and death* University of California Press, 2006). That argument is a new form of academic hybrid discourse that blends insights from the esoteric kabbala with philosophical speculations derived from a wide variety of thinkers -- an ontology of time that is a grammar of becoming, playfully and poetically articulated.

The paradoxical relationship between the languages relevant to doubling is perhaps most succinctly indicated by a classic metaphor of the *Tao Te Ching* (ch. 11):

Thirty spokes share the wheel's hub;
It is the center hole that makes it useful...
Therefore profit comes from what is there;
Usefulness from what is not there.

References

Denny Borsboom. *Measuring the Mind: conceptual issues in contemporary psychometrics*. Cambridge University Press, 2005 [\[summary\]](#)

Berger Busse. *Mensuration and Proportion Signs: Origins and Evolution*. Clarendon Press, 1993

Keith Critchlow:

- *The Hidden Geometry of Flowers: living rhythms, form and number*. Floris Books, 2011
- *The Mystery of Flowers: the sacred geometry of plants*. *Resurgence*, 272, May/June 2012
- *The Golden Meaning : An Introduction*. Kairos Publications, 2014
- *Order in Space: a design source book*. Thames and Hudson, 2000
- *Islamic Patterns: an analytical and cosmological approach*. Inner Traditions, 1999

Jared Diamond. *Collapse: how societies choose to fail or succeed*. Viking Press, 2005

Thomas Homer Dixon:

- *The Upside of Down: catastrophe, creativity and the renewal of civilization*. Knopf, 2006
- *The Ingenuity Gap*. Knopf, 2000

Stephen Jay Gould. *The Mismeasure of Man*. Norton, 1981

Douglas Hofstadter:

- *Gödel, Escher, Bach: an Eternal Golden Braid: a metaphorical fugue on minds and machines in the spirit of Lewis Carroll*. Basic Books, 1979 [\[summary\]](#)
- *I Am a Strange Loop*, 2007 [\[summary\]](#)

Shobhana Madhavan and Robert Barrass. *Unsustainable Development: could it be a Ponzi Scheme?* *Sapiens*, 4, 2011, 1 [\[text\]](#)

Gary Meisner. *The Golden Ratio, Beauty and Design: it's time to 'face' the facts*. *Golden Number*, 9 November 2015 [\[text\]](#)

Elisabeth Noelle-Neumann:

- *The Spiral of Silence: public opinion -- our social skin*. University of Chicago, 1984.
- *The Theory of Public Opinion: the concept of the spiral of silence*. *Communication Yearbook*, 14, 1991

David Robson. *The Intelligence Trap: why smart people make dumb mistakes*. W. W. Norton, 2020J

John James Roche. *The Mathematics of Measurement: a critical History*. Springer, 1998

Lee Sallows. *Geometric Magic Squares: a challenging new twist using colored shapes instead of numbers*. Dover Publications, 2013

James J. Solberg:

- *Easy Magic Square Methods and Tricks*. Sun Mountain Publications, 2019
- *Magic Square Methods and Tricks*. Sun Mountain Publications, 2016
- *Modeling Random Processes for Engineers and Managers*. Wiley, 2008

Alexander Wendt. *Quantum Mind and Social Science: unifying physical and social ontology*. Cambridge University Press, 2015

Vasco Zara. *Music, Architecture, Proportion and the Renaissance Way of Thinking*. *European Review*, 2020 [\[text\]](#)



This work is licensed under a [Creative Commons Attribution-NonCommercial 4.0 International License](#).

For further updates on this site, [subscribe here](#)

