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Global Economy of Truth as a Ponzi Scheme

Personal cognitive implication in globalization?

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Introduction

Pyramid schemes, Ponzi schemes and multi-level marketing

Globalization as a Ponzi scheme?

International institutional promotion of a globalization Ponzi scheme?

Ponzi demography sustaining Ponzi globalization?

Ponzi scheme as one instance of a process in general system dynamics

Constraints on multi-level psychosocial systems

Cybernetic orders of self-referential feedback

Group operation of Ponzi schemes more systemically understood?

Cognitive implication in a personal Ponzi scheme?

Possible representations of paradoxes of global comprehension

Global comprehension "from within"?

References

Introduction

There is the possibility that the [Ponzi scheme](#) pattern is far more general than is readily assumed. What is termed a "Ponzi scheme" is then to be considered as merely one instance of the pattern exemplified by the [Madoff investment scandal](#).

Conventionally a Ponzi scheme is a fraudulent investment operation that pays returns to investors from their own money or money paid by subsequent investors rather than from profit. 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](#).

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](#). Much of the challenge is evident in the denial that any such comparison is appropriate and that there are indeed similarities to be recognized meriting careful consideration by appropriate authorities. As has been argued, so-called "Ponzi demography" can be understood as a vital collective subterfuge as a means of sustaining economic globalization as a Ponzi scheme.

As with the Ponzi schemes recognized as financial fraud, disguising any such recognition is presumably achieved through skillful public relations and image management (as with the Madoff case). Cultivation of such an image might be usefully compared with the classic redecoration of the [Potemkin village](#). In that case the person deceived was [Catherine the Great](#) of Russia. In the Madoff case it was the [US Securities and Exchange Commission](#). Which authority with oversight responsibility might be "deceived", wittingly or unwittingly, in the case of a global Ponzi scheme -- especially in a "post-truth era"?

Additionally however, the systemic nature of the pattern suggests that there is a case for recognizing that we are all operating "personal Ponzi schemes" and variously projecting them onto understandings of the global system, as previously discussed ([Personal Globalization](#), 2001). This process is intimately entangled with personal aspirations to greater coherence and integrative comprehension, readily confused and conflated with understandings of globality. There is thus a sense in which "inside" is confused with "outside" in the operation of some form of Ponzi pattern yet to be fully understood.

The title of this document implies a fruitful ambiguity. Is the global economy indeed to be understood as a Ponzi scheme? Or is it rather that the ["economy of truth"](#) is a global Ponzi scheme -- as may be variously understood as systematically "designed off" the table of global discourse ([Varieties of the "Unsaid" in sustaining psycho-social community](#), 2003)? In that sense is there indeed a ["big lie"](#) to be recognized ([Existential Challenge of Detecting Today's Big Lie: mysterious black hole conditioning global civilization?](#) 2014)?

The concern has been variously highlighted with respect to its political dimension (Andrea Abel, [International Political Economy of Truth Commissions: Reputations and Lending in the Aftermath of Transitions](#), 2008; Zeynep K. Hansen and Marc T. Law, [The Political](#)

Pyramid schemes, Ponzi schemes and multi-level marketing

A degree of [distinction between Ponzi schemes and pyramid schemes](#) is provided by *Wikipedia* with relevant citations:

While often confused for each other, Pyramid schemes and Ponzi schemes are different from each other. They are related in the sense that both pyramid and Ponzi schemes are forms of [financial fraud](#). However, Pyramid schemes are based on [network marketing](#), where each part of the pyramid takes a piece of the pie / benefits, forwarding the money to the top of the pyramid. They fail simply because there aren't sufficient people, hence by the time one comes to the tenth level, the pyramid needs 10 billion people to sustain it. Ponzi schemes, on the other hand are based on the principle of "[Robbing Peter to pay Paul](#)" -- early investors are paid their returns through the proceeds of investments by later investors. In other words, one central person (or entity) in the middle taking money from one person, keeping part of it and giving the rest to others who had invested in the scheme earlier.... Some Ponzi schemes can depend on [multi-level marketing](#) for popularizing them, thus forming a combination of the two.

Various concerns have been expressed in the USA regarding such distinctions:

- Federal Trade Commission:
 - [Facts for Consumers; The Bottom Line About Multilevel Marketing Plans and Pyramid Schemes](#)
 - [FTC Charges Internet Mall Is a Pyramid Scam](#)
 - [Pyramid Schemes: International Monetary Funds Seminar on Current Legal Issues Affecting Central Banks](#)
 - Debra Valentine: [Pyramid Schemes](#) (13 May 1998)
- William W. Keep and Peter J. Vander Nat: [Multilevel marketing and pyramid schemes in the United States: An historical analysis](#) (*Journal of Historical Research in Marketing*, 2014)
- Alan R. Adaschik: [The Federal Reserve is a Ponzi Scheme](#) (*Wake Up World*, 18 April 2014)

Globalization as a Ponzi scheme?

Is globalization some form of Ponzi scheme -- perhaps also to be understood as a pyramid selling scheme? The latter image would offer the strange irony of replicating the central focus of deprecated civilizations of the past -- curiously echoed by its use on the [dollar bill](#). The concern here is where the distinction has been made and proven in systemic terms. **Where is the proof that the global economy is not a massive Ponzi scheme?** For whom would such proof be credible?

Is the avoidance of such clarification of a similar nature to that with respect to the cultivation of systemic ignorance with regard to similarities in the dependence on oil and on drugs (whether prescribed or proscribed) -- more generally understood as "substance abuse"?

Indications with respect to the global economy that such distinctions merit careful clarification are evident in the argument of various commentators and bloggers:

- James Saftjan: [Was whole economy a Ponzi scheme?](#) (*The New York Times*, 1 January 2009), commenting on the Madoff investment scandal, notes:

And it is in this way that we are all Ponzi limited partners: We too thought our retirement funds and houses were growing miraculously, though ours was an illusion fueled by debt rather than fraud, and we too made plans based on those asset values that now stand in ruins.

- [12 Numbers About The Global Financial Ponzi Scheme That Should Be Burned Into Your Brain](#) (*The Economic Collapse*):

The numbers that you are about to see are likely to shock you. They prove that the global financial Ponzi scheme is far more extensive than most people would ever dare to imagine. As you will see below, the total amount of debt in the world is now more than three times greater than global GDP. In other words, you could take every single good and service produced on the entire planet this year, next year and the year after that and it still would not be enough to pay off all the debt. But even that number pales in comparison to the exposure that big global banks have to derivatives contracts. It is hard to put into words how reckless they have been.

- [The Entire Economy Is a Ponzi Scheme: The Global Financial System is Insolvent](#) (*Global Research*, 13 April 2013; *Washington's Blog*, 12 April 2013)
- [Ponzi World \(Over 3 Billion NOT Served\)](#):

The globalized economy is a colossal Ponzi Scheme in which the vast majority survive on the bread crumbs falling off the table. The possibility of 7 billion people achieving a consumption-oriented lifestyle is zero, so the World Bank conveniently set the poverty line at \$1.25/day to legalize global slavery. As long as someone else's children are doing the suffering, it's "all good". Post-2008, this illusion was extended merely by plundering all future generations.

- [Ponzi Schemes](#):

The really worrying thing is that we in the developed world seem to be totally oblivious to the fundamental limits to growth in production..., even though these factors have been gradually growing right under our noses for the past three decades or so. Instead of making the fundamentally enforced changes, we have chosen to keep this inherently unsustainable system going by raking in more and more consumption from the future, primarily through totally unsustainable levels of debt....

The one and only reason why we have been able to keep this up to this day is because **the vast majority of us participating in this mother of all Ponzi schemes have not yet identified this fraudulent system for what it is.**

- [When The Global Ponzi Scheme Is Exposed There Is Going To Be A Massive Panic](#) (*King World News*, 3 May 2016)
- Daniel Stelter: [Ending the Era of Ponzi Finance: ten steps developed economies must take](#) (Boston Consulting Group, January 2013)
- Michael Hudson and Chris Hedges: [The Great Ponzi Scheme of the Global Economy](#) (*CounterPunch*, 25 March 2016)
- Joe Romm: [Is the global economy a Ponzi scheme?](#) (*ThinkProgress*, 8 March 2009):

Yes, homo "sapiens" sapiens have constructed the grandest of Ponzi schemes, whereby current generations have figured out how to live off the wealth of future generations. Yes, we are all in essence Madoffs (many wittingly, most not) or at least his most credulous clients.

- Tim O'Reilly: [The Biggest Ponzi Scheme of Them All](#) (*Radar*, January 2009)
- Greg Pytel: [Financial Crisis? It's a pyramid, stupid](#) (April 2009) arguing that the financial system was turned into a pyramid scheme in a technical, legal sense (not just proverbial)

Especially eloquent in this respect is Tim Lee ([Pi Economics](#)):

- The financial system as a whole has had the characteristics of a Ponzi scheme if we look at it fundamentally. By this I mean that we should think about the true value of assets as being derived from the future flow of goods and services that the assets can lay claim to or produce. If market prices of financial and real estate assets rise a lot but there is no increase in the ability of the economy to provide goods and services in the future, then the apparent increase in wealth is illusory. (as cited by Saftjan, *The New York Times*, 1 January 2009)
- Intelligent observers will worry about the inflationary consequences and also [moral hazard](#), in that any incentive for the governments of troubled economies to get their respective houses in order is then removed. Unfortunately, the longer-term consequences would be likely to be much worse than this. It is becoming ever more obvious that, in a fiat money regime, the merging of monetary and fiscal policies together with a commitment by governments to support banks, and central banks to support financial markets, results in the whole financial system becoming the equivalent of a giant Ponzi scheme.... In this "system", the central bank implementing more quantitative easing is no different, in economic terms, from Bernie Madoff marking up his client accounts every month. ([Circular commitments lead to a Ponzi economy](#), *Financial Times*, 1 November 2011)

International institutional promotion of a globalization Ponzi scheme?

The concern here is that **there does not appear to be any formal distinction between globalization and a global Ponzi or pyramid selling scheme**, especially as they merge into multi-level marketing schemes. Those promoting globalization, especially those subscribing to a neoliberal world view, seemingly have no need to clarify these distinctions in relation to the international institutions which endeavour to frame globalization as inevitable and of unquestionable benefit.

In this sense how are the strategies of the World Bank, the IMF, the United Nations Development Programme, or of regional central banks, to be distinguished from those promoting pyramid selling schemes? In the case of the European region for example, the case has variously been made (Mario Blejer, [Europe is running a giant Ponzi scheme](#), *Financial Times*, 5 May 2011; Gregory White, [Former IMF Official Calls Europe's Bailout Program A Pyramid Scheme](#), *Business Insider*, 6 May 2011).

The main document of authoritative relevance would appear to be from the Office of the Chief Economist of the World Bank Group (Kaushik Basu, [Ponzis: The Science and Mystique of a Class of Financial Frauds](#), July 2014, WPS6967). The abstract reads:

Ponzis are among the most ubiquitous and least understood phenomena of economic life. They acquired a certain salience with the global financial crisis of 2008 and the crash of Bernie Madoff's celebrated Ponzi scheme. This paper explains the structure of Ponzi schemes and argues that what makes this such a troubling phenomenon is its ability to be camouflaged amid legitimate practices. It is shown, for instance, that the common practice of giving stock options to employees could be a potential Ponzi that allows corporations to flourish for a while by borrowing from its own future. The paper discusses the need for intelligent regulation to incise harmful Ponzis (not all Ponzis are harmful) while taking care not to damage the legitimate activities that surround them.

Of particular interest is the **total lack of reference to the globalization process**. As with UNDP, Ponzi schemes and pyramid selling

are problematic processes held to be occurring "elsewhere" -- and in which such institutions are themselves neither implicated nor totally complicit. In systemic terms, they are curiously, if not suspiciously, "above that". This is evident in the IMF studies of their incidence and the guidance it offers to those vulnerable to them (*IMF Survey: IMF Advice Helps Fight Financial Fraud as Schemes Multiply*, IMF, 12 February 2009).

As queried by Paul Amery with respect to the IMF's boosting of the size of its [New Arrangements to Borrow](#) from US\$50 billion to US\$550 billion:

Can you see any difference between Charles Ponzi's "postal reply coupon" scheme, Ivar Kreuger's match empire, the Lloyd's insurance market's 1980s reinsurance spiral - to give three of many examples - and the IMF's new arrangement? All are essentially pyramid schemes, dependent on new money to prop up an increasingly unwieldy structure and maintain belief in the ability to pay out. In the case of the IMF's enlarged NAB facility, we have insolvent national governments joining together to promise to lend money they don't have back to themselves. (*The Ultimate Ponzi Scheme, ETF*, 16 April 2010)

In its introduction to the nature of an IMF proposal, *Global Research News* indicated in 2015:

As first reported by *Forbes*, the International Monetary Fund (IMF) dropped a bomb in its October *Fiscal Monitor Report*. The report paints a dire picture for high-debt nations that fail to aggressively "mobilize domestic revenue," which is code for "aggressively tax its citizens." It goes on to build a case for drastic measures and recommends a series of escalating income and consumption tax increases - culminating in the direct confiscation of assets.

Why is the IMF proposing this? Because global governments and central banks pumped trillions of dollars of YOUR money into the banks and stock market over the last several years, catapulting public debts to tens of TRILLIONS of dollars. But now, governments and central banks can no longer sustain these debt levels, and global wealth confiscation is their only way to maintain the Ponzi scheme. So it's more apparent than ever, if you want to keep your savings & retirement out of the hands of desperate governments, there's only one thing you can do. (*The IMF Proposes "Global Wealth Confiscation": the appropriation of household savings*, *Global Research*, 3 April 2015)

The text quotes a particular comment from *Forbes*:

If politicians should fail to engage in this kind of wholesale robbery, the only alternative scenario the IMF posits is government bankruptcy and hyperinflation. The IMF makes no proposes to reign in the Ponzi-scheme entitlement programs that are bankrupting us (*The International Monetary Fund Lays The Groundwork For Global Wealth Confiscation*, 15 October 2013).

In an earlier study, [Allan H. Meltzer](#) argues with respect to the IMF:

... the IMF quota increase and the policy on which it rests is a type of international Ponzi scheme. The creditor banks have assets that are valued above their market value. If they were bonds, their value would be much lower on the books of the banks. Because they are loans, the banks continue to carry the assets at their face value. The bank examiners encourage this practice despite their obligation to protect safety and soundness (*Five Reasons for Opposing the IMF Quota Increase*, In: *Constructive Approaches to the Foreign Debt Dilemma*, Taxpayers Foundation, 1983).

At the time of writing [Christine Lagarde](#) has been found guilty of negligence in approving a massive payout of taxpayers' money to a controversial French businessman during her former position as a French finance minister. No punishment was imposed but there are concerns for the credibility of the IMF of which she is currently managing director (*Christine Lagarde avoids jail, keeps job after guilty verdict in negligence trial*, *The Guardian*, 19 December 2016; *IMF Head Lagarde Found Guilty of Criminal Negligence*, *Global Research*, 20 December 2016; Jean-Pierre Lehmann, *Lagarde's Failure to Do the Honorable Thing -- And Resign*, *The Globalist*, 22 December 2016).

The conviction naturally raises the question as to whether there are other issues with regard to which the managing director of the IMF is expected to be "negligent", especially given its track record with regard to the appointment of a previous managing director (*Pre-Judging an Institution's Implicit Strategy by the Director's Private Behaviour: remarkable parallels in the case of the IMF and Dominique Strauss-Kahn*, 2011).

Given the seeming implication of the IMF, it is understandable that little authoritative clarification is available distinguishing such policies from their perception as Ponzi schemes, as articulated by critics. Bluntly stated, undertaking any such analysis would be a "bad career move" for an economist -- and unlikely to be recognized as meriting a Noble Prize.

Ponzi demography sustaining Ponzi globalization?

With respect to population growth, why is more not always better? The question is addressed by [Joseph Chamie](#), as a former director of the [United Nations Population Division](#), arguing:

Bernie Madoff's recent Ponzi scheme has drifted out of the world's headlines. However, there is another even more costly and widespread scheme -- "Ponzi Demography" -- that warrants everybody's attention. While it may come in many guises, Ponzi

demography is essentially a pyramid scheme that attempts to make more money for some by adding on more and more people through population growth....

According to Ponzi demography, population growth -- through natural increase and immigration -- means more people leading to increased demands for goods and services, more material consumption, more borrowing, more on credit and of course more profits. Everything seems fantastic for a while -- but like all Ponzi schemes, Ponzi demography is unsustainable. (*Is Population Growth a Ponzi Scheme?* *The Globalist*, 4 March 2010)

As a result of such commentary, the term 'Ponzi demography' has now entered the Australian population debate, as noted by Quentin Dempster (*Population sustainability and the Ponzi demography*, *The Drum*, 5 August 2010). The argument has been further articulated (John Seager, *Baby Busts and Ponzi Demography: The Costs of Population Growth*, *Sustainablog*, March 2013; *Population Growth, Ponzi Schemes and Xenophobia*, 26 June 2015; Mark Mendlovitz, *Mass Immigration and Ponzi Demography*, *Californians for Population Stabilization*, July 2013; David R. Francis, *Is population growth a Ponzi scheme?* *Christian Science Monitor*, 17 August 2009).

It is however tragically symptomatic that Joseph Chamie has only been able to articulate this concern after retiring from the UN. [The pattern could be playfully explored in the light of the tendency to ensure that bureaucrats were systematically castrated in some empires of the past -- a civil service prudently "manned" by *eunuchs*. Seemingly the creative modern adaptation is to allow eunuchs to "recover their balls" on checking out of global governance service. Playfully further explored, this would indeed offer special irony in the case of the UN Population Division -- possibly justified by the capacity of *castrati* entering the service to express the highest human values?]

Religious shunning: Especially problematic is the minimally discussed commitment of religions to unconstrained increase in the population. This may even be recognized in terms of competition between them to increase their relative number of adherents -- a policy described as *natalism*. (*Breeding for God In Europe*, *Prospect*, 19 November 2006).

Irrespective of the validity of the argument, it is characteristic of a potential Ponzi scheme that the possibility of such dynamics cannot be reasonably debated. Any reference to the possible vulnerability of global civilization to overpopulation must be immediately blocked in any strategic discussion. The point can be variously made (*Institutionalized Shunning of Overpopulation Challenge: incommunicability of fundamentally inconvenient truth*, 2008; *United Nations Overpopulation Denial Conference: exploring the underside of climate change*, 2009).

Especially active in this process are the Abrahamic religions, most notably the Catholic Church, as argued with respect to the Papal Encyclical (*Laudato si'*, 24 May 2015) supportive of action on climate change (*Papal Concern for Climate Change and Refugee Care: a means of concealing criminal systemic negligence?* 2015). As with any Ponzi scheme, disguised by some form of Potemkin-style public relations, Ponzi demography is characterized by institutional *doublespeak*, as separately argued (*Indifference to the Suffering of Others: occupying the moral and ethical high ground through doublespeak*, 2013).

The tragic mass movement of refugees into Europe at the time of writing can then be seen as an instance of "Christian Demography", given the manner in which it is a significant consequence of the principles of "Christian Democracy". That policy has enabled European business to benefit economically to a considerable degree from the manufacture of the bombs which have engendered the movement of asylum seekers. An indicator of *Refugees per Kiloton* offers a means of understanding this relation, as separately discussed (*Evaluating the Grossness of Gross Domestic Product*, 2016).

Are humanitarian Christian values now being employed as a public relations shield to disguise such cynicism (*Starvation Imagery as Humanitarian Trump Card? Counterproductive emotional blackmail engendering worldwide indifference*, 2016)? Counterproductively?

Sustainability of development? Such concerns raise the question as to whether the sustainability of development merits exploration in terms of the dynamics of a Ponzi scheme (Shobhana Madhavan and Robert Barrass, *Unsustainable Development: could it be a Ponzi Scheme?* *Sapiens*, 4, 2011, 1). The latter argues that:

Analogies with Ponzi schemes can be perceived or implied in relation to resource depletion, environmental degradation or unsustainable living standards, and also when questions are raised concerning the justification of interventions ostensibly to promote sustainability. Most environmental concerns, particularly with medium- and long-term impacts, have the potential to generate such perceptions: examples include climate change, nuclear waste, hazardous wastes, toxic substances, soil degradation, declining biodiversity, and fish stock depletion.

If "more is better" is indeed not the case when it comes to population growth, are the possibilities of *zero growth* credible and to whom?

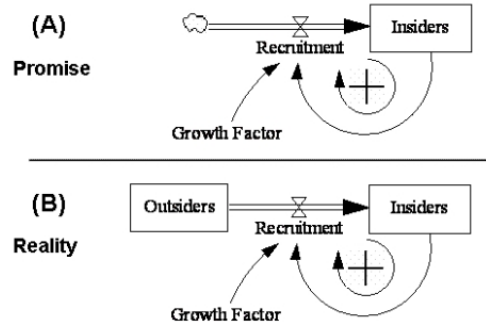
Ponzi scheme as one instance of a process in general system dynamics

Given the example of "Ponzi demography", the question is how such schemes might be explored with the insights of *general systems* dynamics -- specifically in order to detect other such instances to which the viability of global civilization could be vulnerable.

Catastrophe theory and system dynamics: More generic indications are to be derived from the argument of Maximilian Mrotzek and Günther Ossimitz (*Catastrophe Archetypes: using system dynamics to build an integrated systemic theory of catastrophes*, 2008). They see the Ponzi scheme as one example of an "Escalation Catastrophe Archetype". They describe it from the perspective of *catastrophe theory* as follows.

Escalation catastrophe

The possibility of a catastrophe is included within the system structure through an escalating feedback loop. We differentiate between two basic concepts of an escalating system. In Figure 4 concept 1 is shown. Here a system existentially needs growth for its survival and as consequences is prone to death in the long run. When growth stops, the system is doomed to collapse. For example a Ponzi scheme... can only carry on as long as new investors enter the business. If no more new investors can be found (which is inevitable due to the exponentially growing need of new investors), the Ponzi-scheme will break down sooner or later. We offer two variants of the process.



In Variant (A) the focus is upon the exponential growth process, which appears to be infinitesimal. This represents the view of the proponents of the Ponzi-Scheme. The reality of any Ponzi-Scheme is displayed in variant (B). We can see that the pool of outsiders for recruitment is limited. It drains out through the recruitment process, until no one is left and the Ponzi-Scheme is doomed to death, since it can live only as long as there is a sufficient inflow of newly recruited insiders.

Complexity theory and agent-based simulation: Noting the widely expressed "discontent" with the Neoclassical framework of economics, a valuable insight is offered by [Sami Al-Suwailem](#) from a perspective within the Islamic Development Bank Group, arguing with extensive references to the relevant literature that:

The recent developments in [complexity theory](#) and [agent-based simulation](#) represent an important departure from the Neoclassical framework. Although this departure is yet to be endorsed by established schools, it is essential for economists to follow these developments in their early stages to be able to evaluate them with a reasonable degree of freedom. More important, these developments appear closer to the Islamic framework of economic behavior. If this proves to be true, research in Islamic economics would greatly benefit from these developments. (*Islamic Economics in a Complex World: explorations in agent-based simulation*, Islamic Research and Training Institute, 2007)

Religion and the No-Ponzi condition: Of particular interest in the Islamic use of complexity theory is its perceived relevance to Islamic economics in showing how *riba* (usury) and *zakah* (charitable giving) affect economic performance:

The requirement that consumption shall be bounded by real resources is the standard text-book assumption of economic behavior, as represented in the intertemporal budget constraint (IBC) and the No-Ponzi-game (NPG) condition.... Ponzi financing arises when fresh loans are used to pay interest on past debt. The NPG condition requires that, in the long run, the present value of debt would eventually vanish, which is equivalent to the [transversality condition](#) required for optimizing dynamic choice.... Studies on sustainability of (government) debt develop econometric tests to examine the fulfillment of the IBC and NPG condition...

Islamic rules forbidding sale before possession, or sale of what one does not have, can be seen as regulations that help mitigate chances of markets becoming Ponzi systems. This is seen to be a promising line for future research. The issues are also explored in conventional economics (Karim Azizi, et al, *Are No-Ponzi Game and Transversality Conditions Relevant for Public Debt? Ideas*).

A complementary approach by Michael Dowd emphasizes a response to the current [crisis in global integrity](#) from a Christian evangelical perspective:

The [imperfections of human nature](#) are not only evident in the ponzi-scheme charlatans, bank CEOs and CFOs, unscrupulous mortgage lenders, and the institutional and governmental structures that make integrous personal action unfit in the world of finance. The imperfections of human nature are also evident in any of us who ever "played" the stock market or who sold our modest home in order to move into an investment -- that is, a house and landscaping far beyond our needs and our means but intended to be sold short-term for a profit.

Thus the housing bubble and bust is evidence of a ponzi-scheme too: Many of us fell for that one; we believed -- and our social systems supported us in believing that we lived in a world without limits -- or that at least we ourselves would get out before the house came crashing down on the next buyer or the one after that. One way to look at this is that our nation suffers today because our nested systems of governance failed to protect us from the consequences of our own less-than-integrous ways of investing personal money and from our own ignorance and self-deception. (*Thank God for Evolution: how the marriage of science and religion will transform your life and our world*, 2009)

It is unclear whether the invocation of "science" there offers the [requisite variety](#) in as rigorous a manner as in the Islamic case (in terms

of cybernetic insights into control processes).

Ecosystemic trophic levels: It is intriguing to note how recognition of a Ponzi-Pyramid scheme naturally implies positioning within a "food chain" (metaphorically understood) through which funds are transferred progressively to those at the top. The metaphor is readily recognizable in the world of finance and business.

Lauri Oksanen (*Trophic levels and trophic dynamics: a consensus emerging?* *Trends in Ecology and Evolution*, 6, 1991, 2):

There are three clearly different views on trophic levels. The systems-ecological tradition sees trophic levels as relatively discrete and well-defined units whose interactions cannot be derived from interactions between constituent populations. The reductionist population-ecological tradition sees trophic levels as inappropriate abstractions that cannot be used in formulating predictive theories. The tradition of trophic dynamics sees the first three trophic levels of autotroph-based ecosystems as reasonable abstractions, useful in formulating predictive theories, but devoid of properties that could not be directly extrapolated from those of constituent populations. Recent literature suggests that the first two schools are converging towards the viewpoints of the third, though the latter has also been modified by the interaction.

In an ecosystem, a food chain represents a succession of organisms that eat another organism and are, in turn, eaten themselves. The number of steps an organism is from the start of the chain is a measure of its **trophic level**. It is frequently asserted that most terrestrial ecosystems only contain 3-4 trophic levels. Other arguments indicate that "occasionally", "rarely", or "on average", there are 5; with 7-8 recognized in some aquatic environments (sometimes even 9).

In their simplest form, food chains are held to start at trophic level 1 with **primary producers** such as plants, move to **herbivores** at level 2, **predators** at level 3 and typically finish with **carnivores** or **apex predators** at level 4 or 5. Again such distinctions (as metaphors) are readily comprehensible in the business environment.

Energy pyramids: A food chain may be understood as the multiplicity of energy pyramids that constitute the transport vector by which nutrient elements, as well as contaminant signals, are moved from one trophic level to the next. A **food web** is the totality of food chains in an ecosystem. A **10% Rule of Ecology** indicates that when energy is passed in an ecosystem from one trophic level to the next, only ten percent of the energy will be passed on.

A particular concern is how **ecotoxins** are transferred up the food chain, as has been extensively argued (*Biocatastrophe: the legacy of human ecology*, Davistown Museum, 2009; M. Padmavathi, *Eco Toxins and Their Impacts on Human Health*, *Research Journal of Agriculture and Forestry Sciences*, 1, 2013, 4, pp. 10-17). The former usefully develops the implications of the metaphorical use of "toxic" in the financial system ("toxic assets", "toxic debt") in sections on: *The Ponzi Schemes of the Shadow Banking System*; *Ecotoxins as Commodities*; *Ecotoxins and Debt as Assets*; *The Global Banking Crisis as a Ponzi Scheme*.

The understanding of trophic systems as forming a pyramid (within which arbitrary distinctions of "levels" are made) is called into question by recognition of the cyclicity of operations within a food web -- recalling the reference above to network marketing as a complexification of Ponzi-Pyramid schemes. Thus in the arguments of Marco Scotti, et al. (*Effective Trophic Positions in Ecological Acyclic Networks*, *Ecological Modelling*, 198, 2006, pp. 495-505):

In the tropho-dynamic analysis of ecosystems the heuristic, discrete concept of trophic level has been replaced by the more realistic, continuous definition of trophic position. In **ecological network analysis** (ENA) the suite of matrix manipulations called **canonical trophic aggregation** (CTA) apportions each species' feeding activity to a series of discrete trophic levels... The effective trophic position is computed as the sum of the fractions of trophic activity that each species performs at different trophic levels... we present an extension of the CTA that combines matrix manipulation and sensitivity analysis. Applying this "extended" CTA to an hypothetical network and to real ecosystems we show how trophic position can be computed taking into account the contribution of external inflows, making it scale-insensitive. Moreover "extended" CTA solves ambiguities related to trophic position in the presence of multiple non-living nodes, considering them as imports.

Orders of magnitude: Another approach to distinguishing "trophic levels" might be through the various depictions of features of the **universe through orders of magnitude** -- perhaps on a scale from 10^{-34} meters to 10^{27} (Cary and Michael Huang, *The Scale of the Universe*, 2012; *Scales of the Universe in Powers of 10*, YouTube, 2012; *Five Visualizations to Grasp the Scale of the Universe*, Brain Pickings, 10 October 2010).

Such an approach could focus more specifically on distinguishing the trophic stages between unicellular and multicellular life, and the emergence of individuality (Richard E. Michod, *Evolution of individuality during the transition from unicellular to multicellular life*, *PNAS*, 104, 2007, May; Jef Akst, *From Simple To Complex*, *The Scientist*, 1 January 2011).

Of some relevance is the recent discovery by astrophysicists simulating the structure of a neutron star's crust that it has features similar to those observed in cellular membranes. The finding suggests that although neutron stars and membranes differ by 14 orders of magnitude in their density, their structures may be determined by the same geometric constraints (*Synopsis: Neutron Stars in a Petri Dish*, *Physics.org*, 1 November 2016).

Unsustainability of pyramidal systems with "excessive" levels: Of relevance here is the recognition that pyramid schemes, simply understood, can only develop up to 9-10 levels before becoming unstable and collapsing as separately noted (*Ponzi Schemes, One in a Billion*, 2012). As indicated in the *Wikipedia* entry with respect to financial fraud), they fail simply because there are not sufficient people. Hence by the time one comes to the tenth level, the pyramid needs 10 billion people to sustain it. Careful analysis of this process with simulation would usefully clarify the potential instability of increasing complexification of the globalization process (E. McDonald-

Madden, et al. *Using food-web theory to conserve ecosystems*, *Nature Communications*, 2016, 7).

The matter is provocatively clarified further by the interactive [Pyramid Scheme Scam Calculator](#) enabling insertion of a variety of estimates (*How far down the pyramid are you?; How many levels does the money jump?; How many people does each participant need to recruit?; What is the drop-out rate?*).

Constraints on multi-level psychosocial systems

The somewhat arbitrary distinction of number of levels recalls the argument of the much-cited paper on cognitive limitations ([George Miller](#), *The Magical Number Seven, Plus or Minus Two: some limits on our capacity for processing information*, *Psychological Review*, 1956). This is but one example of such constraints, as separately argued (*Comprehension of Numbers Challenging Global Civilization: number games people play for survival*, 2014).

Studies have explored the viability of pyramidal (hierarchical, taxonomical) organizational structures of different depth -- with obvious implications for their increasing instability (and incomprehensibility) as the number of levels increases (cf [hierarchy theory](#); [cognitive hierarchy theory](#); [delaying](#); Andreas Butz, *Hierarchies and Trees: visualizing topological relations*, 2009) . Ironically it would appear to be that God in the Christian tradition is considered to be similarly constrained to a 9-level [hierarchy of angels](#). Judaism has a 10-fold [angelic hierarchy](#).

The issue is variously implicit in:

- corporate for-profit organizations
- administrative systems of governance
- military organizations
- religious hierarchies, sects and cults
- non-profit initiatives and intentional communities
- academic disciplines and educational institutions

Their potential for failure should lend itself to ready analysis (*Variety of System Failures Engendered by Negligent Distinctions*, 2016).

The constraints are especially noteworthy where importance is attached to the relative superiority of the wisdom, insight, expertise or experience at the higher levels of the pyramid. This is partially implicit in the number of:

- degrees (and qualifications) conferred and recognized in an academic context
- expertise recognized in attribution of distinctions and rankings in certain domains: chess/go, martial arts ("belts"), notably as borrowed by [Six Sigma](#) to indicate relative skill in systemic oversight
- degrees attributed in secretive societies, most notably freemasonry and scientology, as well as recognition of levels of initiation in some belief systems

The acceptance of such qualitative distinctions raises interesting questions regarding:

- the status of the myriad "tweets" -- in comparison with the many academic papers (as distinguished by the [Impact Factor](#) of the journal in which they are published), the even more limited number of theses (themselves distinguished in quality by university rankings), and the academic prizes to which their writers may aspire (see [List of Prizes and Awards](#))
- the status of the "99%" (as recognized by the [Occupy Movement](#)) -- in comparison with the "1%", with the "0.01%", or the "0.001" (Andrew Gavin Marshall, *The Shocking Amount of Wealth and Power Held by the 0.001%*, *AlterNet*, 12 June 2013).
- the distinctions made by IQ percentiles as indicated by the [IQ Percentile and Rarity Chart](#) ([IQ Comparison Site](#)) and cultivated by [high IQ societies](#), most notably [Mensa International](#)

The transition from one such "trophic level" to another in any of the above cases merits recognition from a systemic perspective as being "born again" (*Varieties of Rebirth: distinguishing ways of being "born again"*, 2004) . As variously understood, "promotion" tends to trigger this metaphorical interpretation. Ironically this may well be preceded by a sense of "death". A promotion is thus readily recognized as "moving up the food chain" -- in existential terms.

Cybernetic orders of self-referential feedback

There is an intriguing pattern of similarity between the above instances and the distinctions made by cybernetics, especially knowledge cybernetics, between orders of feedback ([Maurice Yolles](#), *Knowledge Cybernetics: a new metaphor for social collectives*, *Journal of Organisational Transformation and Social Change*, 3, 2006):

Of particular relevance is the sense in which the higher levels necessarily preclude to an ever greater degree the possibility of questioning and negative feedback. This may be recognized in terms of ever higher orders of the certainty offered by [confirmation bias](#). Beyond the requirements for [double loop learning](#), as variously advocated, the arguments of Maurice Yolles and Gerhard Fink point to the potential role of system comprehension in terms of third-, fourth- and fifth-order cybernetics (*Generic Agency Theory, Cybernetic Orders and New Paradigms*, 2014):

First order cybernetics: It is the systems sciences, and notably cybernetics, that explore negative feedback loops between the elements of well-bounded systems leading to an objectivist positivist approach. Cybernetics was initially the study of the "objective" control of machines (artificial and natural). [Heinz von Foerster](#) (*Ethics and Second-Order Cybernetics*, 1991) has however suggested a form of "**zero-order cybernetics**" when activity becomes structured; when 'behaviour' emerges, but without reflection upon the 'why' and the 'how' of this behaviour. Cybernetics is then implicit

Second order cybernetics: This extends cybernetics to include the interface with the observer, the "subjective" feature of cognitive methodology -- a theory of the observer based on functional-constructivism. Partly inspired by the work of Gestalt psychology, the question that emerged was the extent to which an inner representation of the outer world was a valid portrait of the macrocosm "outside"? How should this internal microcosmic representation be used in order to avoid illusions and abusive action?

That which is observed cannot be neatly abstracted and separated from the observer's own biological, nervous and cerebral structuration (cf Sara B. Jutoran. *From Observed Systems to Observing Systems*, 1985/2005). Related explorations are associated with constructivist epistemology (Humberto Maturana, Paul Watzlawick and Ernst von Glasersfeld), the hypercycle (Manfred Eigen) and the self-referential calculus (Francisco Varela, *A Calculus for Self-reference, International Journal of General Systems*, 2, 1975, pp. 5-24). A journal is now devoted to the issues of second order cybernetics, *autopoiesis* and cyber-semiotics (*Cybernetics and Human Knowing*).

Third order cybernetics: Because of the intimate connection with reflection on [social constructivism](#) and [constructivist epistemology](#), the use of "second order cybernetics" has been interwoven with various proposals for a "third order cybernetics". David Pocock (*Loose Ends*), offers a critique of such usage in family therapy -- an obvious example of "mutable worlds". Another discussion speculated on the distinction: 1st order cybernetics is spectacular; 2nd order cybernetics is simulating potential fields with request/response; 3rd order cybernetics is potential fields. Note also the discussion by Kent D Palmer (*On the Social Construction of Emergent Worlds: the foundations of reflexive autopoietic systems theory*, 1996).

In principle this represents the current state of the art. Here the observer is understood to be part of a coevolving system -- the focus is on how observers and systems co-evolve across different social systems. The dominant discourse is understood to be reproduced and transformed through local interactions. As noted by Chris Lucas (*Complexity Theory: Actions for a Better World*, 2001):

This is a more intrinsic (embodied) methodology and shows the ongoing convergence of all the various systemic disciplines, as part of the general world paradigm shift noticed recently towards more integrated approaches to science and life. In 21st Century systematics, boundaries between systems are only partial and this implies that we must evolve with our systems and cannot remain static outsiders. Thus our mental beliefs echo our systemic behaviours, we co-create our realities and therefore internal and external realities become one. Understanding this mutual control, exhibited by us on our world and our world on us, takes us into the metaview outlined here, where we can see ourselves as being part of the system under examination.

Fourth order cybernetics: Helpfully summarizing the contrasts between the above, M. Zangeneh and E. Haydon (*The Psycho-Structural Cybernetic Model, Feedback, and Problem Gambling: a new theoretical approach, International Journal of Mental Health and Addiction*, 1, 2, 2004) propose a fourth order cybernetics as follows:

Central to this effort is the application of a unique, critical theory inspired by the works of Anthony Giddens (1971, 1990; see discussion on modernity and reflexivity) and John Francois Lyotard (1979; see discussion on postmodernity) to the cybernetic theoretical framework. The epistemological orientation of the theory proposed here is that of multiple realities shaped by social, cultural, economic, ethnic, gender and disability values, which centralize on the asymmetric power relations in society

Fourth order cybernetics is thus understood as concerned with how multiple realities are shaped by, and impinge upon, power relationships within society.

Group operation of Ponzi schemes -- more systemically understood?

Especially valuable in the systems perspective above is the generalization of "money" into an understanding of "energy" -- potentially more general than that recognized in the analysis of ecosystems. This recalls the framework of physics in which "energy" and "information" are instances of a more fundamental understanding precluding simplistic definition. It might even encompass understandings of confidence as experienced (*Primary Global Reserve Currency: the Con? Cognitive implications of a prefix for sustainable confidality*, 2011).

Any collectivity can be readily explored as a pyramid -- as with traditional hierarchical models. Given the network marketing argument above, the greater complexity of networks does not preclude the operation of some form of Ponzi game within the group and in relation to membership campaigning. This raises the question of which groups have been responsive to analogues of the above-mentioned "intertemporal budget constraint" (IBC) and the "No-Ponzi-game" (NPG) condition -- especially when the preoccupation is not with "money" but with some other "value".

Instances meriting recognition, beyond conventional understandings of accumulation of wealth, include:

- accumulation of possessions and property -- as characteristic of the quest for ownership (land, intellectual property, a partner, etc)
- accumulation of facts, evidence and details -- as characteristic of the sciences, judicial processes of inquiry (and the quest for information by the security services)
- accumulation of explanations ("answers"), comprehension and insight -- as characteristic of the sciences, religion and philosophy (notably reframed as cultural property, and possibly as secret in some way)
- accumulation of relevance -- as characteristic of the natural and social sciences, the policy sciences, and institutions of governance (including the security services)
- accumulation of confidence and trust -- as characteristic of authorities and leaders (professions, banking, law, religion,

governance and security services)

- accumulation of approval, recognition, reputation and credibility -- as with the gathering of followers (including the "likes" of social media) and becoming a star
- accumulation of contacts and relationships -- especially evident in cyberspace
- accumulation of merit -- as characteristic of some belief systems, preoccupied with the life hereafter
- accumulation of privileges and entitlements -- as representative of status and distinction

Framed in other terms, the process can be understood as ensuring "pull-in" ("suck-in"), "buy-in", and "lock-in" -- especially in the light of a marketing perspective or any related [gravity model](#). The promotion of any such process through promise-making and "talking up" a better future, again exemplified by a financial Ponzi scheme, can be explored in terms of "hope-mongering" (*Credibility Crunch engendered by Hope-mongering: "credit crunch" focus as symptom of a dangerous mindset*, 2008).

Whilst the process at the lowest "trophic" level may be relatively clear, especially when characterized by tangible tokens, far less evident is the nature of what is accumulated at the highest level -- being characteristically intangible, possibly mainly evident in the eyes of the beholder. Indications are offered by the quest for:

- hegemony / control / dominance / power / monopoly ("[cornering the market](#)", "[full-spectrum dominance](#)")
- status / ranking / precedence -- as with the ambition of "being the best" (or "number one"), or "being great again" (as explicitly promised by politicians in the USA, UK, France, and Italy)
- unity / unification / integration / singularity / know-it-all / overview
- discovery / curiosity ("been there, done that") -- as with the attraction of the highest mountains
- rarity, especially with aesthetic characteristics or strength -- as with works of art, a beautiful partner, or the lost (tribes, symbols, treasure, holy grail)
- authenticity, whether in works of art, iconography, or intercourse of any kind -- especially evident in the case of sacred artefacts fundamental to cultural identity

Such values merit recognition like the [strange attractors](#) in the dynamics of complex physical systems (*Human Values as Strange Attractors*, 1993).

The characteristics of any Ponzi scheme start to become evident as the number of levels increases, with complementary indications of indifference and erosion of credibility. Potentially more questionable is how the group initiative -- as a "Ponzi scheme" systemically understood -- may then be recognized in terms of indoctrination (imposition of belief, values or norms), as unquestionable groupthink. This is especially relevant to the emergence of "populism" -- a deprecated manifestation of the "lowest" trophic level, disruptive of the systemic process exploited by the highest level.

To the extent that the exploitative nature of the Ponzi game requires careful disguise, it is appropriate to note how credibility is given to hyperbole and superlatives in advertising and public relations ("the best", "world leader", etc). Especially interesting is the legitimization of [puffery](#).

One intriguing consequence of the operation of such a scheme is the manner in which unrecycled "waste" is engendered and ejected, possibly as toxic products (entering the food chain) or as intractable individuals. The latter were notably labelled as "[deplorables](#)" by Hillary Clinton during the presidential campaign (*The New York Times*, 10 September 2016).

There is a sense in which much is "remaindered" and "left behind" by such a scheme, as separately discussed (*Reintegration of a Remaindered World: cognitive recycling of objects of systemic neglect*, 2011). Striking examples are offered by the [Great Pacific garbage patch](#), orbiting [space debris](#), [Antarctic research station debris](#), or tourist waste in areas of natural beauty ([Mount Everest](#), etc).

Cognitive implication in a personal Ponzi scheme?

Tropic versus Trophic? The "strange attractors" noted above could be usefully recognized as [tropisms](#), namely a form of growth in response to a particular stimulus. The following are distinguished in biology, although metaphorical connotations can be readily recognized:

- [chemotropism](#), movement or growth in response to chemicals
- [geotropism](#) (or [gravitropism](#)), movement or growth in response to gravity
- [heliotropism](#), diurnal motion or seasonal motion of plant parts in response to the direction of the sun, (e.g. the sunflower)
- [plagiotropism](#), movement or growth at an angle to a line of stimulus such as gravity or light.
- [orthotropism](#), movement or growth in the same line of action as the stimulus.
- [hydrotropism](#), movement or growth in response to water
- [phototropism](#), movement or growth in response to lights or colour
- [thermotropism](#), movement of growth in response to temperature
- [electrotropism](#), movement or growth in response to an electric field
- [thigmotropism](#), movement or growth in response to touch or contact
- [exotropism](#), continuation of growth "outward"

The cognitive analogues are not recognized by psychology although the *Psychology Wiki* offers entries on both [tropism](#) and [trophic levels](#) in their biological sense. It is also intriguing to note a long-standing debate about the relation between the two insights, especially in terms of their etymology (Robert W. Buck, et al. *Trophism versus Tropism*, *New England Journal of Medicine*, 13 March 1952; Werner Steinberg, *Trophic vs. Tropic*, *JAMA Network*, 3 May 1952; George W. Corner, *Tropic versus Trophic in the Terminology of the Pituitary Hormones*, December 1943).

In the exploration of cognitive parallels, it is intriguing to note the determination of measures of the Human Trophic Level in different populations in terms of their diets in relation to the food chain (Bob Yirka, [Researchers calculate human trophic level for first time](#), *Phys.org*, 3 December 2013). As noted with respect to that insight:

We human beings like to think of ourselves as living at the top of the food chain -- doing so implies we have dominion over all the other plants and animals living on this planet. And while that implied perspective is perhaps correct in one sense, it's not when looked at in its truest biological sense.

Trophic levels? As implied above, each individual is variously engaged with external reality at the lowest "trophic level" -- most notably in the consumption of facts or factoids (as via the media), the quest for the resources to sustain daily life, and possibly the engagement in dialogue with its variety of "emissions" (*Sins of Hot Air Emission, Omission, Commission and Promise: the political challenge of responding to global crises*, 2009).

Of greater relevance to this argument is how the primary process of this trophic level provides some form of nourishment for higher trophic levels, of greater subtlety and of increasing intangible nature. Aspects of this pyramid are recognized in such devices as [Maslow's need hierarchy](#) with its five levels: physiological, safety, love/belonging, esteem, self-actualization. Presumably there should be little surprise to the distinction of five levels, given the argument above. More intriguing is the neglected possibility of a greater number of trophic levels. This is suggested by traditional belief systems giving pyramidal form to their recognition of nine levels of consciousness -- potentially implied by depiction of the pyramid on the dollar bill.

As a model long-favoured in academic discourse, the Maslow device essentially discourages any exploration of personal cognitive implication -- as is characteristic of the non-self-referential nature of such discourse. This is somewhat ironic in that it offers labels for what might be interpreted as degrees of increasing self-reference -- but with little ability to render them meaningful within that framework.

Outside-Inside? The question here is the nature of the possible "internal" cognitive implication in construction of models then (radically) dissociated from that implication through projection onto a reality framed as "external". Aspects of this argument are of course a theme of [social constructionism](#), [personal construct theory](#), and [enactivism](#) -- well-framed by the traditional phrase of "laying down the path through walking". This featured as central to the arguments of [Francisco Varela](#) (*Laying down a path in walking: a biologist's look at a new biology*, *Cybernetic*, 2, 1986, pp. 6-15).

The argument can be explored through the nature of the binary distinction between "outside" and "inside", as discussed separately (*World Introversion through Paracycling: global potential for living sustainably "outside-inside"*, 2013). This was developed through the following sections:

Incoherence of external reality	Paracycling: towards a terminological and visual clarification
Transformation of worldview from "inside-outside" to "outside-inside"	Sphere eversion as guide to the cognitive twist of global introversion?
Imagining a window of strategic opportunity for change	Imagining transcendence appropriately challenging to comprehension
Insightful confusion: outside-in, inversion, introversion?	Approaches to distinguishing requisite cognitive variety
Alleviating the "weight" of external matters	Paradoxically dynamic coherence of internalized "pantheons"
Alternation of worldview between "inside-outside" and "outside-inside"	Engaging with "peaceful" and "wrathful" deities
Paradoxical cycling between "inside-outside" and "outside-inside"	Embodying the world as a strategic opportunity

Globalization? Especially intriguing is the manner in which personal cognitive implication applies to any sense of global, globality and globalization -- as a progressive identification with ever greater coherence. Aspects of this process in systemic terms were noted above.

The argument can be developed otherwise in the sense that globalization, recognized as an external process (associated with global civilization on the planetary globe), can be fruitfully recognized as an internal process (associated with a personal sense of global coherence). One thread to this argument is the sense in which "global" also implies coherence in the most general sense, as recognized in its mathematical sense, where it is typically contrasted with "local", as separately discussed (*Future Generation through Global Conversation: in quest of collective well-being through conversation in the present moment*, 1997).

More specific development of the argument can be made through exploring globalization as a personal process, as discussed separately (*Personal Globalization*, 2001). There the argument included the following considerations.

Conceptual prosthetics and surrogates	Universe, solar system, cell and atom
Conceptual traps and Ponzi schemes	Technology as metaphor
Globalization of experience	Planetary thinking and human experience
Conceptual de-regulation	Globalized experience as nonlocal consciousness
Conceptual dimensions of globalization	Patterns that connect
Reflecting the environment	Clues to the pattern that connects
Recognizing the 'cultural rainforests' of the globalized person	

Internal-External mirroring? Such an argument suggests the need to recognize the degree to which **explanatory articulations regarding external reality mirror internal cognitive possibilities**. An aspect of that argument has been developed from the perspective of cognitive psychology with respect to mathematics ([George Lakoff and Rafael Nuñez](#), *Where Mathematics Comes From: how the embodied mind brings mathematics into being*, 2001). This suggests the possibility of a fruitful "confrontation" between mathematics and theology, as separately discussed with respect to any self-reflexive global reframing to enable faith-based governance

(*Mathematical Theology: Future Science of Confidence in Belief*, 2011).

The argument can be developed with respect to mimicry, whether **biomimicry**, ecomimicry or technomimicry (*Reimagining Principles Enabling an Existential Ecostery: engendering out-of-the-box awareness and its transformation*, 2013; *Engendering a Psychopter through Biomimicry and Technomimicry Insights from the process of helicopter development*, 2011; *Enactivating a Cognitive Fusion Reactor Imaginal Transformation of Energy Resourcing (ITER-8)*, 2006).

The **mirror test** is fundamental to recognition of self-consciousness. Given speculation regarding communication with extraterrestrial cultures, there is then the interesting possibility that such aliens may value a form of mirror test relating to higher "trophic levels", as separately discussed (*Self-reflective Embodiment of Transdisciplinary Integration (SETI): the universal criterion of species maturity?* 2008). Current cognitive challenges of "globality" may then be extended to challenges of "universality" -- far beyond current human assumptions in that regard (and despite presumptuous use of that term).

Indicative speculation in that regard is offered in the entry in the *Encyclopedia Galactica* on *Trophic Levels in Society* (appropriately citing as source the *Reality Trophic Levels of Interstellar Societies* (2677) in *Reviews in Metasociology*). The entry concludes:

Metasociologists have known for a long time that there is a strong correlation between the second Xmutex index (the variance of reality layering) and the number of trophic levels in the economy. A simple economy cannot sustain a society of many reality levels. More surprisingly, a simple reality levelling cannot sustain the hypereconomies that reach 10 trophic levels. This observation, sometimes called the Xmutex Law of Reality Economics, has been a major source of investigation among economic eschatologists. There is an extensive history of Realist criticism of the Law, but it remains a firmly established empirical finding.

With respect to globalization, the approach also suggests a means of exploring the nature of a "flat earth mentality" -- as a stage in the emergence of global insight (*Irresponsible Dependence on a Flat Earth Mentality -- in response to global governance challenges*, 2008).

Betwixt and Between? Clearly an aspect of the cognitive challenge is the risk of entrapment in binary distinctions reinforcing unfruitful polarization, as may be variously discussed (*Coherent Value Frameworks: pillar-ization, polarization and polyhedral frames of reference*, 2008). Whilst there may be conditions where there is a case for either "inside" or "outside", there is also a case for "inside and outside" or for "neither inside nor outside", as argued by Kinhide Mushakoji (*Global Issues and Interparadigmatic Dialogue*, 1988).

These conditions could be imagined to be related as framed by some kind of **phase diagram**. The most common of these relates the phases of matter, most notably water (solid, liquid, gas, ions). These conditions merit reflection in relation to current preoccupations with post-truth and its Potemkin-village function (*Towards articulation of a "post-truth table"?* 2016).

Possible representations of paradoxes of global comprehension

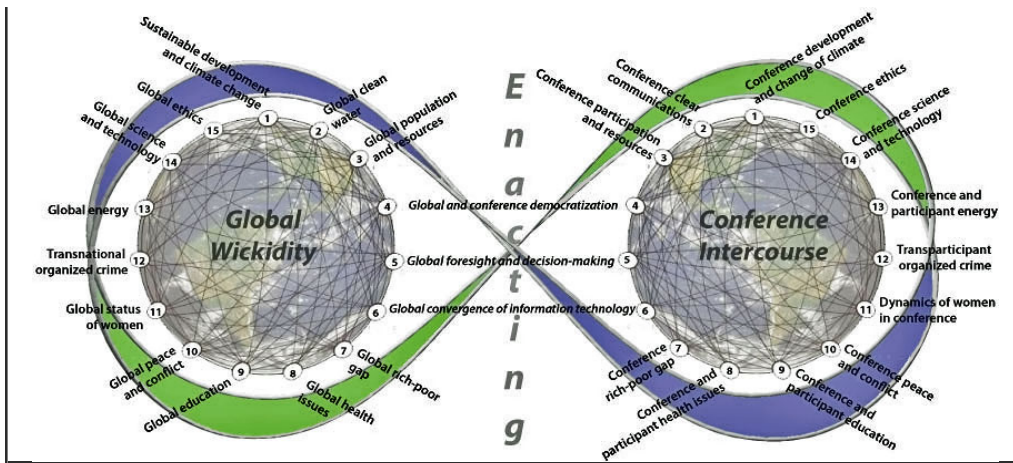
Potentially, **the "internal" cognitive challenge is then to be fruitfully recognized as reflected in psychosocial externalities** (and vice versa, necessarily). This is then a case of living imaginatively within and between these conditions, as separately discussed (*Living as an Imaginal Bridge between Worlds: global implications of "betwixt and between" and liminality*, 2011).

Bridges: iconic, archetypal and otherwise	Dynamics of cognitive possibility: "possum"?
Beyond "Us" and "Them"	Living "as" an imaginal bridge, rather than "on" one
Living "betwixt and between"	Enacting, engendering and embodying
Liminality of betwixt and between	Negative capability: a bridge to nowhere as a bridge to knowhere?
Contemporary references to "betwixt and between"	Cyclic bridging between worlds of modality
"Reality" of "betwixt and between"	Enabling autopoiesis through poiesis
Vestigial "pillar" of the middle way	Questing for a dynamic quality without a name
Avoiding constraining pillar-dependency	

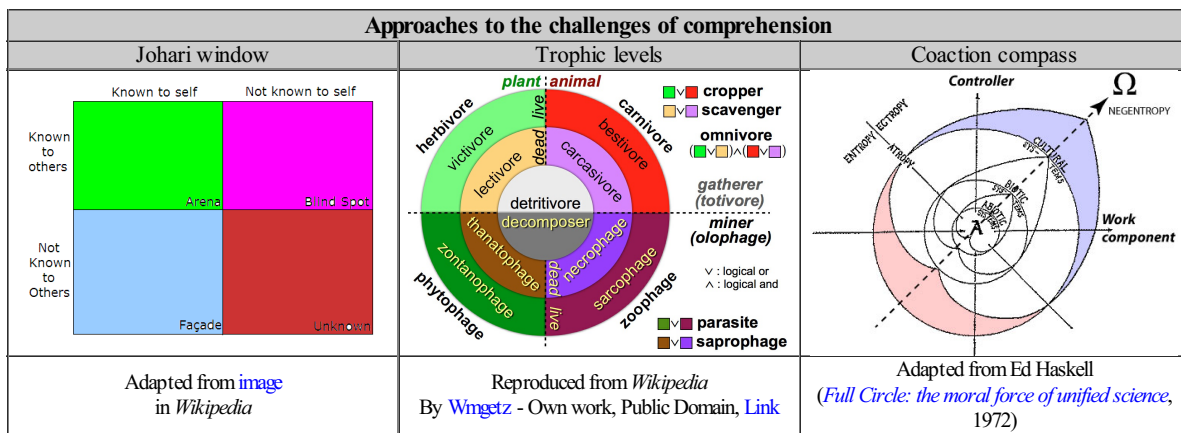
The question is then how to facilitate engagement with conditions of paradox and liminality (*Imagining the Real Challenge and Realizing the Imaginal Pathway of Sustainable Transformation*, 2007). The possible catalysts for this process of "re-cognition" were explored in an annex (*In Quest of Mnemonic Catalysts -- for comprehension of complex psychosocial dynamics*, 2007).

Embedding in a Mobius strip: One provocative approach is to center any symbol of "external" globality within a **Mobius strip** as a complement to an "internal" sense of such globality. This was explored (below) with respect to the "externalities" of the **15 global strategic challenges** identified by the **Millennium Project** then complemented by "internal" processes potentially central to the to the self-reflexive preoccupation of a conference, as argued separately (*Embodying Strategic Self-reference in a World Futures Conference: transcending the wicked problem engendered by projecting negativity elsewhere*, 2015).

30 Future Global and Conferencing Challenges for Humanity (self-referential adaptation of the 15 Global Challenges of the Millennium Project)

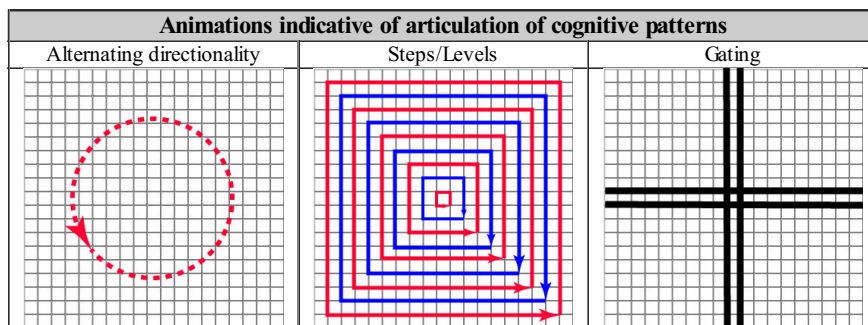


Matrix elaboration: Another approach is to "play" with the conventional 2D matrix depiction fundamental to many academic models of reality -- as presented below. That of the [Johari window](#) is especially insightful with respect to the challenges of comprehension between cognitive trophic levels and contrasting styles of cognitive tropism (*Understanding the Johari Window model, Self-Awareness*, 10 November 2013).



Of similar relevance to the preoccupation of this argument are the [Four Quadrants of Integral Theory](#) (AQAL), elaborated by [Ken Wilber](#), and extended by the [Spiral Dynamics](#) of [Don Beck](#), resulting in a set of 8 levels (Barrett C. Brown, *An Overview of Developmental Stages of Consciousness*, Integral Institute, 2006).

Matrix dynamics? Such cognitive organization can be further extended by consideration of the significance associated with so-called [magic squares](#), both in mathematics and in symbol systems -- especially through implied systemic relationships between categories so distinguished. In the following animations the matrix, understood as articulating sets of categories to different degrees, is variously overlaid by contrasting patterns.



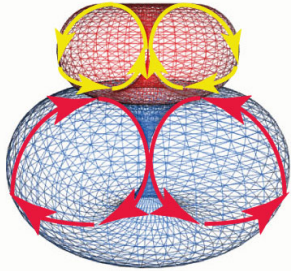
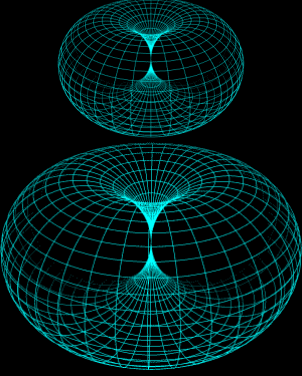
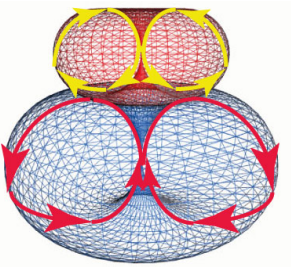
The animation in the centre anticipates the discussion below of stepped pyramids. Such progressive stacking is suggested by the 2D animation above (centre), where systemic processes are suggested by arrows. These recall the manner in which rituals may be celebrated by circumambulation of a pyramidal temple sat each level. The articulation in the animations is extended to 19x19 in recognition of its importance in the most sophisticated of strategic board games, namely the Chinese [game of go](#) -- which, in the central stepped variant gives rise to 10 levels. Beginners often play on smaller 9x9 (5 levels) and 13x13 (7 levels) boards, and the game has been played on a 17x17 grid (9 levels).

The image on the left (above) is suggestive of comprehension of degrees of openness and closure, highlighted symbolically by the reference of [Doris Lessing](#) to *The Four-Gated City* (1969) and by the arguments of [Orrin Klapp](#) (*Opening and Closing: strategies of information adaptation in society*, 1978) and [Hilary Lawson](#) (*Closure: A Story of Everything*, 2001).

Representation in 3D: This approach can be taken further by recognizing how such patterns imply the possibility of greater insight

through their representation in three dimensions rather than two. Thus the organization of a magic square can be explored in terms of a so-called **magic cube** or through particular polyhedral forms (*Proof of concept: use of drilled truncated cube as a mapping framework for 64 elements*, 2015).

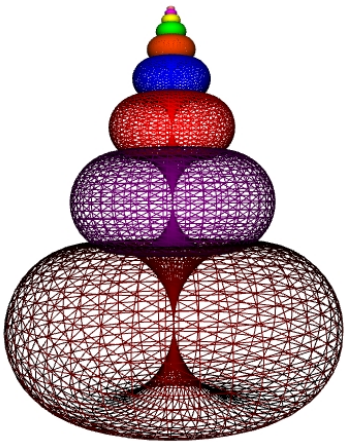
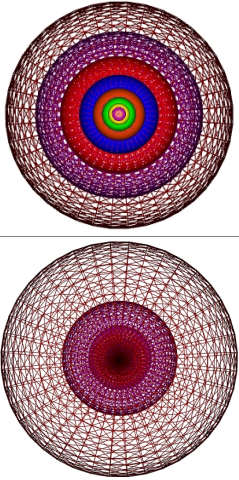
With respect to the dynamics of the relationship between cognitive trophic levels, this may be explored through superposition of tori as indicated immediately below and in the animations which follow, as separately explored (*Visualization in 3D of Dynamics of Toroidal Helical Coils*, 2016). The cognitive combination of integral theory and spiral dynamics might well be understood in helicoidal form.

Animation of conjoined tori		
Circulation through the vortex (Variant A)	Animation indicative of interacting between levels	Circulation through the vortex (Variant B)
		
	Adaptation, with permission, of animation by Wolfgang Daeumler (<i>Horn Torus</i>)	

Levels: stacking and stepping: Especially intriguing is the manner in which insights of higher order may be associated with the stepped design of temples and pyramids. In that respect it is remarkable to note the importance attached to a 9-fold "stack" of levels of consciousness -- namely what could be understood as a "stack" of cognitive trophic levels (whatever the social implications).

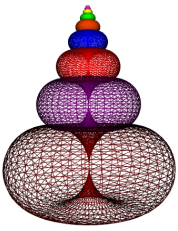
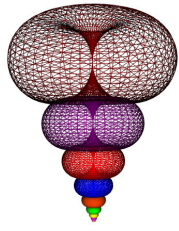
A further point of interest is the perspective on the set of stacked levels along the axis. As shown in the image below (right), the smallest toroidal then appears at the centre of what is highly reminiscent of a conventional **bullseye target** -- for archery, darts, etc -- some of which have 9 rings. Whether as a **need hierarchy** or otherwise, this can be understood as the focus for the subtlest "tropic" aspiration.

Understood otherwise, the 9 levels of the stack are appropriately reminiscent of the 9-level temple designs of some cultures (cf. **Nine Story Stupa**, **Chichen Itza**, **Tikal**) and their association with understandings of 9 levels of consciousness. Such levelling now also features in progress through some online games, reinforced by the levels featured in the fantasy fiction of the *Discworld* series of **Terry Pratchett**, or of **metaphysical preoccupations in science fiction**.

Suggestive stacking and relative rotation of cognitive trophic levels (interactive 3D animation in VRML and X3D variants)	
"Side" view (9 interacting levels)	Views "down" and "up" common axis (9 levels)
	
Adapted from X3D and VRML models kindly prepared by Sergey Bederov of Cortona3D	

The colours provisionally used above to distinguish the levels correspond to those indicated by Spiral Dynamics (Chris Cowan and Natasha Todorovic, *Colors of Thinking in Souiral Dynamics*, 2004). Of related interest is the manner in which helical curves can be traced "up" and "down" the stack, suggestive of the cognitive significance that may be associated with the geometry of DNA (*DNA Supercoiling as a Pattern for Understanding Psycho-social Twistedness*, 2004). As below, the system of stacked levels may be used to distinguish suggestively the perceptions of their relative quantitative and qualitative characteristics.

Use of level stacking to indicate contrast between the few and the many	
Quantitative implication	Qualitative implication

	minute at highest level (the "0.01%")	expansive "wealth" at highest level (controlling "90%" of resources)	
	numerous at lowest level (the "99%")	highly constrained at lowest level	
Adapted from X3D and VRML models kindly prepared by Sergey Bederov of Cortona3D			

Global comprehension "from within"?

In what form can anything be usefully expressed about one's own personal sense and comprehension of "globality" -- especially for oneself? The challenge has of course been recognized by many -- as well as ignored by many. Notably appropriate is the title of the post-humous work by [Gregory Bateson](#) (*Angels Fear: towards an epistemology of the sacred*, 1988).

One common device is the use of metaphor -- whether in words, music, or art. The vocabulary of mysticism, and the experience of psychoactive drugs, are a common resource. Metaphor may be employed by taking widely recognized phenomena of "external reality" and implying an analogous pattern in the experience of an "inner reality".

This process could even be described metaphorically as using externalities like a surf board to surf the waves of experience of inner processes. Hence the reference above to biomimicry and technomimicry -- even ecomicry. In considering globalization, a form of economicry might be imagined.

Especially intriguing in this respect is the set of external realities by which human cultures have chosen to order the universe and its exploration. Notable authors in this respect are [Joseph Campbell](#) (*The Inner Reaches of Outer Space: metaphor as myth and as religion*, 1986), [Henryk Skolimowski](#) (*The Participatory Mind: a new theory of knowledge and of the universe*, 1994), and [Marsilio Ficino](#), as discussed separately (*Composing the Present Moment: celebrating the insights of Marsilio Ficino interpreted by Thomas Moore*, 2001).

For some, greater significance can be given to the coherence and "globality" of that experience through the patterns framed by mathematics and astrophysics -- and especially cosmology. Their highly creative quest for a unifying understanding engenders a multiplicity of enabling metaphors (*Entering Alternative Realities -- Astronautics vs Noonautics: isomorphism between launching aerospace vehicles and launching vehicles of awareness*, 2002).

Examples are provided by insights into the origin of the universe (the Big Bang), of black holes, dark matter, and the formation of the solar system and its planets (*Psychosocial Implication of Without Within: enjoying going solar for oneself*, 2013). In each case insights are offered into the role of energy, information and relative frames of reference. The disciplines in question are however exceptionally indifferent to the inner cognitive implications of their insights -- or even whether they are readily accessible to comprehension. This is especially the case with some of the insights considered most profound and seminal by mathematics -- despite the above-mentioned arguments of Lakoff and Nunez (2001).

Rather than accepting the conventional external framing of globalization through which most, if not all, are placed at the periphery (even defined as peripherals), how can an individual frame experiences "at the centre of the universe"? Given the struggle of cosmology, is there more to be discovered with respect to any sense of individual uniqueness and originality -- possibly even as a singularity?

Aside from the vainly repeated injunctions of religion down the centuries (with their only too evident destabilization of a civilization in crisis), is there need for a new language through which higher orders of meaning are to be recognized and sensed (*Engaging with Insight of a Higher Order: reconciling complexity and simplicity through memorable metaphor*, 2014). Cognitive "trophic levels" of a higher order relevant to the seductive sense of negentropy to be informed by some form of indwelling intelligence (*Implication of Indwelling Intelligence in Global Confidence-building: sustaining the construction and dynamic of psychosocial reality through questioning*, 2012).

In a global civilization characterized by a dangerous degree of divisiveness -- unencompassed by any fruitfully meaningful paradigm -- the mystery of gravity merits continuing attention. As implied by the variety of "gravity models", this suggests that cognitive processes with behavioural implications could be considered and experienced in such terms. Arrogance in whatever form has a gravitational sense to it -- whether experienced internally or externally. The associated dynamics can be experienced like a whirlpool or vortex -- metaphors common in that regard.

In the absence of more fruitful "explanations" within society, each is therefore free to engender "implantations" (*Being the Universe: a Metaphoric Frontier*, 1999; *Engendering 2052 through Re-imagining the Present*, 2012; *Eliciting a Universe of Meaning -- within a global information society of fragmenting knowledge and relationships*, 2013).

Such a process of creative imagination (extensively [explored in fiction](#)) offers a means of reinterpreting continuing speculation, framed by the so-called [simulation hypothesis](#), regarding the possibility that humanity dwells unwittingly inside a simulation. This is potentially consistent with recognition by some belief systems of the fundamental [misperception of reality](#) and the [emptiness of form](#) -- although the "simulation" may well be self-engendered. The challenge of "incomprehension" for all may then be more usefully framed through engendering "outcomprehension" (*Living with Incomprehension and Uncertainty: re-cognizing the varieties of non-comprehension and misunderstanding*, 2012).

What of the implications that one may oneself effectively engender and embody the Ponzi scheme pattern -- so skillfully projected onto problematic external globalization? Clearly there is a particular "cognitive twist" to be "re-cognized". How indeed, as "designers of the simulation", is "kidding oneself" as to its existence effected in reality as personally experienced -- Potemkin style?

Potentially far more problematic is the [human sacrifice](#) (whether voluntary or involuntary) considered appropriate at the highest level of the stepped pyramids of pre-Columbian cultures, notably [Teotihuacan](#) and [Tenochtitlan](#) (cf [human sacrifice in Mayan culture](#), [human sacrifice in Aztec culture](#)). Heart-extraction by the priesthood was viewed as a means of liberating the *istli* and reuniting it with the Sun: the victim's transformed heart flies Sun-ward on a trail of blood ([Ray Kerkhove, Dark Religion? Aztec Perspectives on Human Sacrifice](#), 2008). In this respect there is considerable irony to the experimental geometrical configuration of stacked 3D tori in that these take the form of a heart pattern, as previously explored ([Cognitive heart dynamics framed by two tori in 3D](#), 2016).

Can a global Ponzi scheme be recognized as a contemporary variant of such a seemingly perverted "logic" -- epitomized by depiction of a stepped pyramid on the dollar bill? More curious is the above-mentioned process of "[hope-mongering](#)" associated with any "heartless" Ponzi scheme and its relation to the voluntary sacrifice made at this time by a jihadi on a pathway to heaven.

It is in this sense that the experience of humour may play a special role -- particularly since it is so systematically designed out of any multi-level academic model of repute. The argument has been developed separately ([Humour and Play-Fullness: essential integrative processes in governance, religion and transdisciplinarity](#), 2005). The point is delightfully made in the following.

The Hazards of System Building by Matthew Melko , System Builder (Offered to participants at the Foundation for Integrative Education Conference, Oswego, August 1969; reproduced in <i>Main Currents in Modern Thought</i> , 269, 2)
<ol style="list-style-type: none">1. You identify with your system. It cost you blood to build it, and if it is attacked, it is your blood that is being shed.2. You cannot tolerate tentativeness, suspension of judgment, or anything that does not fit the system.3. You cannot apprehend anyone else's system unless it supports yours.4. You believe that other systems are based on selected data.5. Commitment to systems other than your own is fanaticism.6. You come to believe that your system entitles you to proprietorship of the entities within it.7. Since humour involves incongruity, and your system explains all seeming incongruities, you lose your sense of humour.8. You lose your humility.9. You accept all these points -- insofar as they apply to builders of other systems.10. So do I. (P.S. I hope I believe in the cult of fallibility)

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