



## A systemic sociological theorem of global evolution

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### **Abstract**

*Starting from an interdisciplinary perspective this essay is focalized on the analysis regarding how the megatrends of demography, technological convergence and world order redesign are shaping a dematerialized global scenario in which a key bifurcation is emerging: on one side the Malthus Trap on the other one the Gegnet, the limitless opening of the possible. The abstraction level of the big data turn into meaningless each local based empirical research that is why the key epistemological challenge of this essay is to evolve the systemic paradigm comprehend big data and the methodological challenge is to draft a deductive nevertheless big data based, theorem of global evolution.*

**Keywords:** Complexity. Convergence. Evolution. Globalization. Sociological theory.

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### **Introduction**

The Systemic Approach to Sociology dramatically declined among the social sciences after Niklas Luhmann's death in 1998. It essentially declined because it was considered:

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- 1) not scientific due to a lack of empirical fieldwork;
- 2) useless in terms of applied policymaking;
- 3) theoretically a specific due to its exceeding variety of interdisciplinary elicitations;
- 4) anitihuman.

This criticism is only partially motivated and is often dramatically founded on the gap between systemic epistemology and non systemic epistemology which usually implies a taken for granted outer world.

Nevertheless systemic sociology needs to be redesigned to manage the exceeding variety of emerging scenarios and high variety and high density complex evolutionary trends in which natural sciences and social ones converge in reframing “natural reality”.

The natural reality is: something meaningless in se (since the first man ever switched a fire on and dressed. See Goudsblom (1994) and systemically relevant merely as a thematic subject of positive and artificial self referential patterns .

This essay is about a general science of complex systems from an interdisciplinary perspective starting from a social system (system/environment) paradigm to focus on psychic, systems, biosystems and social systems from the key paradigm shift (the fourth one within this approach).

This new design implies to rethinking three key concepts: individual, organization and life:

### **Key concept is individual the first**

They are reframing within a strategic policymaking for social global change though the logical shape of a theorem. The individual is a kind of coding and selecting system among others. By evoking Ortega Y Gasset's distincion between shellfish and castaway, Individuals (which would be more adequate to define psychic systems according to Luhmann's semantics). are “tautological” and autological thus self referential and autopoietic castaways in the ocean of undefined possibility.

These individuals operate and live as castaways in the oceans of undefined possibility (this is its self referential circular closing) while persons are

mere ethological copies of shellfishes primitively in search of a daily reproduced illusion of stability and “eternity”.

In practice, individuals select complexity in its contingency but are operatively aware that complexity cannot be reduced "for real" while persons model and construct the illusion that their daily taken for granted world is "reality" Complexity enlightens that everything is formally interconnected and interdependent.

Nevertheless this interconnections and interdependences (the relational side) are meaningless in se if there is no observer (not necessary human) able to draw a distinction (in G. Spencer Brown's terms).

This observer/agent (in Kaufmann's semantics) selects at the double contingency level of (exceeding) variety and density. The vision provided by this essay of a general science of complex systems is a science of exceeding variety and density of selecting systems at an adequate abstraction level to focus on the differences which make the difference in terms of global interconnection and evolutionary terms.

### **The second key concept is Organization**

The organization is the relentless process of density/variety evolution.

### **The third key concept is life**

Life is the autopoietic evolution of information.

### **Epistemology and theory**

The evolution of the concept of system though the XX century and the beginning of the XXIst one was featured by a rather sterile debate between the axiom that systems are mere epistemological criteria and the axiom that systems exist in nature, for real. These two axioms shaped two different systemic visions which in the beginning of the XXIst century were dramatically reshaped by the increasing convergence among Nanotechnologies, Robotics, Informatics, Genetics and Neurosciences the so called Convergent technologies (CT).

The two axioms powerfully merged in an immaterial, global constellation of energy and information in which digitalization shapes meaning and the sense making process.

Communication becomes the only procedural form of systemic self reproduction. As Luhmann brilliantly wrote: "for a theory of autopoietic systems, only communication is a serious candidate for the position of the elementary units of the basic self referential process of social systems" (LUHMANN, 1990, p. 6).

Niklas Luhmann (1927-1998) died before digitalization replaced the idea that virtual and concrete items were separated entities: digitalization amazingly demonstrated everything and essentially science, technology and business first of all might be digitalized.

Also the most concrete and physical items can be digitalized or rather are intrinsically digital.

The paradigm shifts within the systemic approach summarized in the table below clearly show that P1 was featured by a very "physical reification of items such as nature, society, people and so on thus a very analogical, concrete narrowed minded approach to "reality".

Luhmann's contribution by introducing the system/environment code (P2) and then by the autopoietic turn (P3) were pivotal to describe the new scenarios of globalization in which dematerialization turns everything into communication flows which let circulate capitals in real time with no place bounds.

Once again, Luhmann's writings anticipated the understanding of emergence in the globalized age just like in his final masterpiece *Die Gesellschaft der Gesellschaft* (1997). Nevertheless, Luhmann's vision was completed before digitalization entered the global scale.

The emergent P4 is the mainstream to the concept of system as a digital unitas multiplex of virtual and physical as both are digital or can be digitalized. This essay considers theoretical contributions from the all four paradigms also valuing the importance of paradigms 1, 2 and 3 for the history of science but privileging P4 perspective focused on an interdisciplinary systemic approach to digital capital, global trends and conceptual maps.

#### The Systemic Approach Paradigm Shifts

Paradigm (P)	Key Authors	Key Concepts
P1) Whole/Part	Ross Ashby Norbert Wiener Talcott Parsons	Culture, control, personality, integration, homeostasis stability, wholeness, struc-

	Ludwing von Bertalanffy Anthony Stafford Beer Ervin Laszlo	tures, parts
P2) System/Environment	Heins von Forester Niklas Luhmann	Functional differentiation, system, communication, order from noise
P3) Autopoesis	Humberto Maturana Francisco Varela Niklas Luhmann	Self production of inner com- ponentes, rhizome, complexi- ty, functional equivalent fluctuation, horizon
P4) Enormous Constella- tion System	Richard Normann Daniel Dennet (2004) Niklas Luhmann	Flucting constellation, auto- poietic reconfiguration, me- tetric complexity, catalog, global plataforma, enormity

**Figure 1**

Fonte: The systemic approach paradigma shifts paradigma (Pitasi in Pitasi-Mancini, 2012. 22

Methodological design founded on artificial simulation models framed into logical-deductive theorems and tested through big data patterns and convergences. In this paragraph, a systemic theorem of global evolution is provided as an exemplary case.

### Methodology and analysis

Let's start by conceptualizing the theorem definition:

“A theorem is a mathematical statement established by means of a proof”  
(CLAPHAM; NICHOLSON, 2009, p. 781).

“A theorem is a which has been proved such as the Pythagorean theorem”  
(DOWNING, 2009, p. 350).

By comparing these two conceptions and applying them to sociological thinking we can consider that a theorem is:

- 1) a statement;
- 2) in this paper I do not mean to shape a mathematical one but a sociological one inspired by a mathematical epistemology;
- 3) the matter it is a sociological theorem and not a mathematical one does not eliminate the fact it must be proved;
- 4) nevertheless the kind of proof is different even if not completely.

The theorem consists in this: the systemic evolution of mankind social systems on Earth affects individual choices and experiences at the key bifurcation kuhnian revolutionary challenges (PITASI, 2007, 2011, 2012 and apparently do not in Kuhn's normality as social life is made of cows ORTEGA y GASSET 1963).

Individual choices and experiences do not affect systemic evolution with the unique effect of the high resonance traffic jam noise paradox which witnesses that individual influences on systemic evolution are blind.

The traffic jam paradox shows you that by interviewing the City Major, the City Traffic Manager, the Municipality Hall Policemen, the individuals sitting in their cars in the jam none of them will tell you that the traffic jam is the outcome of their intentions, ideas, values ecc ecc. The Traffic Jam Paradox can be easily applied to all people supporting and ecological-green vision: none of them will tell you that the Malthus Trap (the Traffic Jam) emerges from their intentions, ideas, values, choices which are focused on a cleaner planet.

Nevertheless a more ecological social order would dive into the Malthus trap if ecological choices dramatically influence the rapport between world population demographic growth (WPDG) and Evolutionary resources Reproduction Speed (ERRS).

If  $WPDG = ERSS$  the trap is already open to let our species enter.

If  $WPDG > ERSSS$  our species is already in the trap.

Once again, in logic- deductive terms, the exit from the trap is an evolutionary systemic bifurcation:

- 1) the making of Malthusian Vision i.e. high quality eco-bio food in a ridiculous amount which imply million and million people fighting for "one tomato";

- 1) a convergent tech reconfiguration evolving capital (genetic, information & more) independently from worked joule" which is the logic solution provided by the theorem provided in this essay.

Figure 2 below (designed by the author describes the shape of the bifurcation while Figures 3 and 4 describe some resource reallocation trends on a global scale up to 2050 (SMITH, 2011, p. 178 and 193). Figure 4 pictures Pearce's hypothesis on population crash (Pearce, 2010: 1-2) which would, at a first and misleading glance, falsify the bifurcation trend described above. Taking Pearce's hypothesis for granted (and it cannot be scientifically, of course) it does not falsify the bifurcation, it rather seems to describe the mildest "day after" scenario of the option A of the bifurcation itself nevertheless Pearce's works seems to be focus on a technological coeteris paribus while from now on to 2050 (and over) the reconfigurational power of convergent technologies is already huge (ARRIS, 2007; ROSE, 2009) and this methodological mistake seems to dramatically reduce Pearce's hypothesis reliability. The bifurcation in which we found a systemic theory of global evolution.

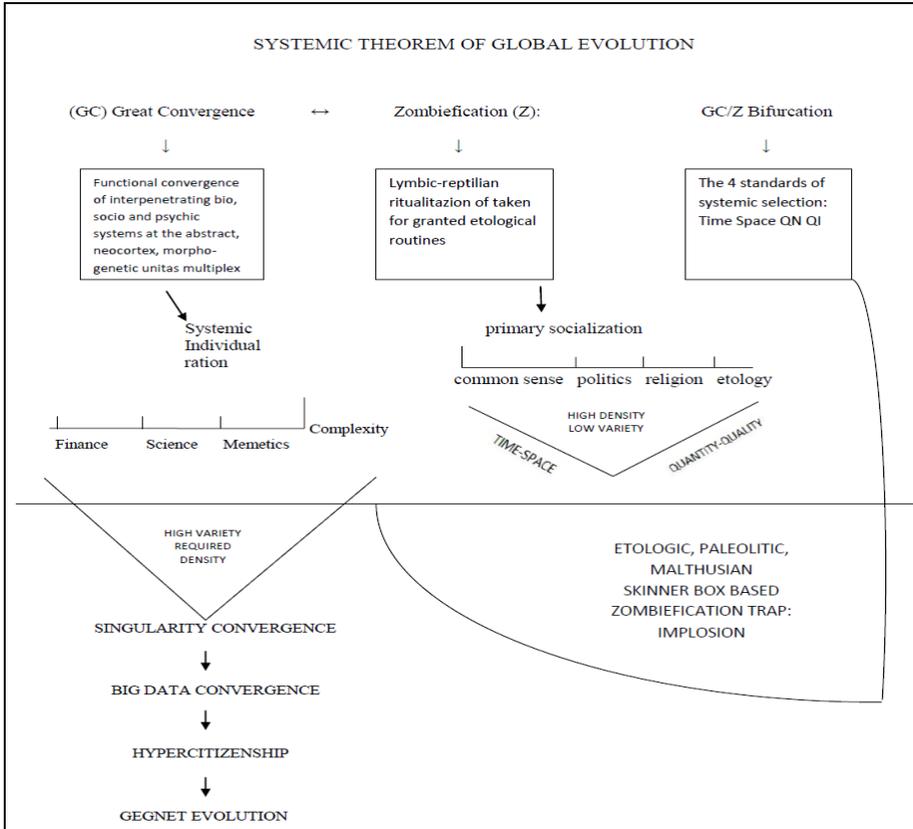


Figure 2. Designed by the author describes the shape of the bifurcation.

**Some Common Measure of Economic Globalization, Peacefulness, and Civil Liberties, Relative to the World**

	Economically globalizing?	Peaceful?	Political freedoms?			Average Score	
	WSJ/Heritage	EWF	KOF Globali- zation	GPI	EIUDI	Freedom House	WSJ/Heritage
Denmark		96	91	97	99	97	Free
Canada		96	95	96	94	93	Free
Finland		91	90	94	94	96	Free
Iceland		92	91	83	97	98	Free
Norway		84	84	90	99	99	Free
Sweden		85	77	97	96	99	Free

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United States	97	94	82	42	89	Free
Russia	18	28	79	6	36	not free
Germany	86	88	89	89	92	Free
United Kingdom	94	96	87	76	87	Free
Japan	89	81	66	95	90	Free
France	64	68	92	79	86	Free
Brazil	41	32	62	41	75	Free
India	31	45	41	15	79	Free
China	26	34	56	49	19	not free

**Figure 3** – Resource reallocation trends on a global scale up to 2050.

Note: expressed as percentile of all sampled countries in the world

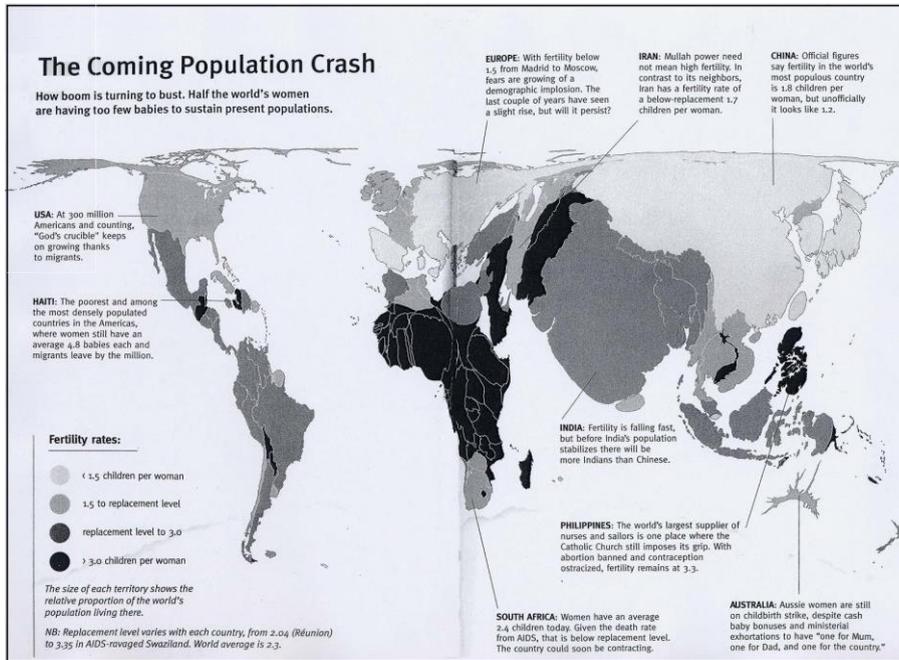
Source: 2009 Index of Economic Freedom, Heritage Foundation, and Wall Street Journal (179 countries); 2008 Economic of the World Index (141 countries); 2009 KOF Index of Globalization (208 countries); 2009 Global Peace Index (144 countries); 2008 Economist Intelligence Unit Democracy Index (167 countries); 2009 Freedom in the World Country Rankings (193 countries).

### Some Population Densities and Trajectories 2010-2050

Country	Density (people/km <sup>2</sup> )	2010	2050	Change (%)
India	369	1,214,464,000	1,613,800,000	33
Canada	3	33,890,000	44,414,000	31
United States	33	317,641,000	403,932,000	27
Iceland	3	329,000	407,000	24

Norway	13	4,855,000	5,947,000	22
United Kingdom	255	61,899,000	72,365,000	17
Mexico	57	110,645,000	128,964,000	17
Sweden	21	9,293,000	10,571,000	14
Spain	90	45,317,000	51,260,000	13
Brazil	23	195,423,000	218,512,000	12
China	141	1,354,146,000	1,417,054,000	5
Netherlands	401	16,653,000	17,399,000	4
Finland	16	5,346,000	5,445,000	2
Denmark	127	5,481,000	41	1
Italy	199	60,098,000		-5
South Korea	487	48,501,000		-9
Germany	230	82,057,000		-14
Russia	8	140,367,000		-17
Japan	336	126,995,000	56	-20

**Figure 4.** Some Population Densities and Trajectories 2010-2050.



**Figure 5.** Pearce's Population Crash Hypothesis.

## Conclusions

The megatrends of demography, technological convergence and world order redesign are shaping a dematerialized global scenario in which a key bifurcation is emerging: on one side the Malthus Trap on the other one the Gagnet, the limitless opening of the possible. The abstraction level of the big data turn into meaningless each local based empirical research that is why the key epistemological challenge of this essay was to evolve the systemic paradigm comprehend big data and the methodological challenge was to draft a deductive nevertheless big data based, theorem of global evolution.

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Recebido: 23/05/2014

*Received:* 05/23/2014

Aprovado: 23/05/2014

*Approved:* 05/23/2014