

A social systems perspective on indicators



PAUL-MARIE BOULANGER

Workshop:
The impacts and Methodology of
indicators and scoreboards

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JOINT RESEARCH CENTRE
ISPRA

Niklas Luhmann



Niklas Luhmann
(1927–1998)

a sociologist who persistently studied the various domains of society and built what is called as a grand theory of society. He tackled fundamental questions regarding how societies are possible.

The theory of observation

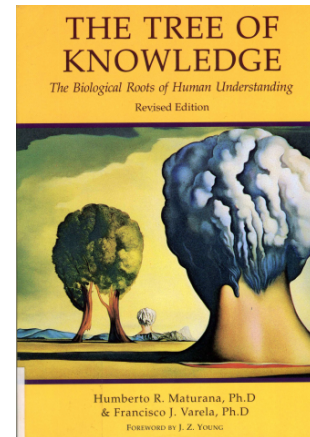
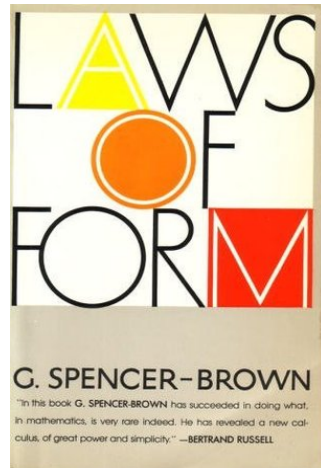
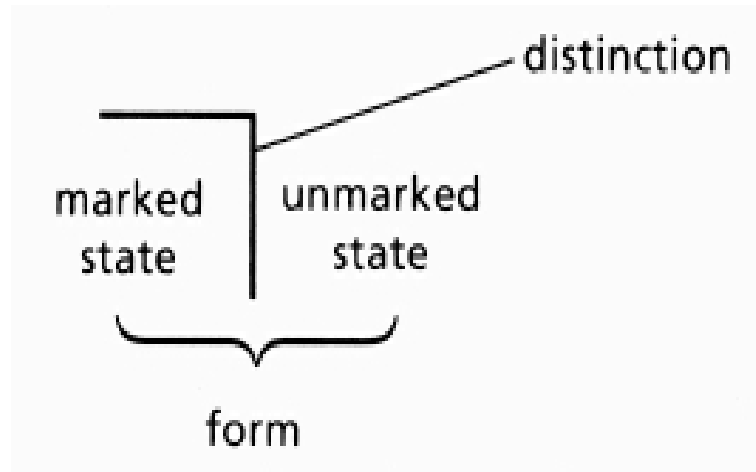


Observing systems (Heinz Von Foerster)

- Observing systems that observe.
- First order observation: “Reality” or “factual” level. Exists/Doesn't exist. Essentialism.
- Second order observation: observing observers' observations. Constructivism.



Distinction - Indication



Distinctions

The act of indicating any being, object, thing, or unity involves making an *act of distinction* which distinguishes what has been indicated as separate from its background. Each time we refer to anything explicitly or implicitly, we are specifying a *criterion of distinction*, which indicates what we are talking about and specifies its properties as being, unity, or object.

This is a commonplace situation and not unique: we are necessarily and permanently immersed in it.



Unities

A *unity* (entity, object) is brought forth by an act of distinction. Conversely, each time we refer to a unity in our descriptions, we are implying the operation of distinction that defines it and makes it possible.

The GDP as a form



indication

Monetized

Non-monetized

Distinction

THE UN-MARQUED IS THE UN-MARKET(ED)

Beyond GDP ?



indication

Monetized
AND
Non-monetized

What remains ?

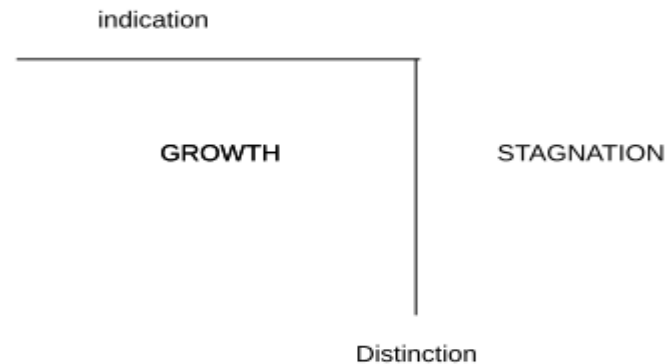
Non-monetized



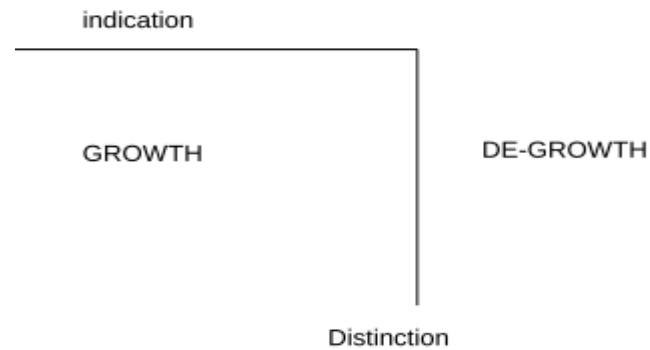
Distinction

Improving GDP ? (ISEW,...)

About GDP...the importance of the un-marked



IS NOT EQUIVALENT TO



Indicators and organizations



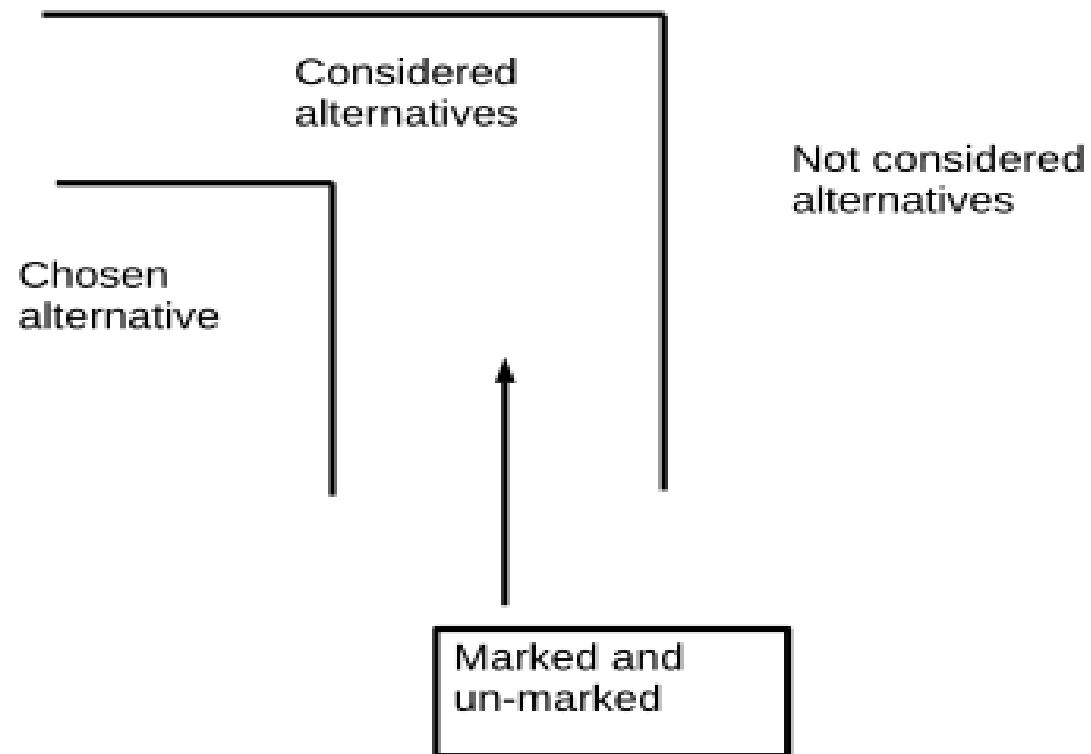
WHAT ROLE FOR INDICATORS ?

Organizations as autopoietic systems



- Organizations are social systems whose communications consist of decisions;
- Every decision paves the way for subsequent decisions. Every decision is the product of earlier decision and gives rise to ensuing decisions. It constitutes a *decision premise* for subsequent decisions.
- A decision is only completed when subsequent decision connect to it.
- Through the process of connected decisions, *uncertainty is absorbed*. «

Decision as form



Decision as form. A two stage operation.

How can an organization deparadoxify its decisions ?



- Decision technologies as decision premises=> strict couplings between information and decision.
- The paradox is displaced in the technology and uncertainty is absorbed.
- Examples of technology:
 - guidelines, standards, labels, accreditations=> indicators
 - consultants, experts, SCIENCE...

Deciding: a paradoxical operation



- Either the considered alternatives are really alternatives and then there is no reason to privilege one of them rather than any other;
- Or they are not **real** alternatives and the one selected is the only possible \Rightarrow No choice \Rightarrow no decision.
- « Only those questions that are in principle undecidable, we can decide. » (Von Foerster)

Indicators as decision premise



- Deciding with indicators = steering : reducing the difference between actual and « desired » value of the indicator.
- In a organizational context, the choice of an indicator constitutes a **decision premise** for further decision, provided that the decision to choose the indicator is complete. => The organisation USES the indicator.
- Choosing an indicator is a decision that decides on the decision premises for other decisions. It is deciding about decisions.
- The uncertainty of the decision is absorbed by the preceding decision about the indicator.

Paradoxes all the way down...



William James (father of American psychology and brother of Henry James) is supposed to have had a conversation with an elderly lady who told him the Earth rested on the back of a huge turtle.

“But, my dear lady”, James asked, “what holds up the turtle?”

“Ah”, she said, “that’s easy. He is standing on the back of another turtle.”

“But would you be so good as to tell me what holds up the second turtle?”

“It’s no use, Professor”, said the lady, avoiding the logical trap. “It’s turtles, turtles, turtles, all the way down.” – Apocryphal

The case of indicators of wellbeing



- Decisions of the welfare state ? Needs indicators
- Which one(s) ? Ask scientists
 - If public opinion agree : GDP and siblings=> succes of the deparadoxification process.
 - If public opinion disagree : GDP and beyond, several alternatives indicators therefore:
 - ✦ No consensus amongst scientist: look for deparadoxisation
 - ✦ => Participation of citizens as a deparadoxisation technique => Back to politics (Merry-Go Round).

Steering with indicators ? The manufacturing of disappointment



- Steering = reduction of a difference between desired and actual indicators' value.
- Two cases :
 - No reduction or not enough => disappointment
 - The target has been reached => it was too modest => fix a new more ambitious target => too ambitious to reachable => disappointment again.

Functional Systems observe each other



AUTONOMY AND STRUCTURAL COUPLINGS

Plenty of indices (Bandura 2008)



1. African Governance Indicators	9
2. Ageing Vulnerability Index	9
3. AIDS Program Effort Index (API)	9
4. Alternative Country-Risk Index (Índice de Riesgo País Alternativo - IRPA)	10
5. APESMA Big Mac Index	10
6. Assessing the Achievement of the Millennium Development Goals (MDGs)	10
7. Basic Capabilities Index (BCI) – Previously “Quality of Life Index”	11
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12. Bribe Payers Index (BPI)	13
13. Capital Access Index (CAI)	14
14. CIRE Human Rights Dataset	14
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17. Commitment to Development Index (CDI)	15
18. Composite Score of Risk – Business Risk Service (BRS)	16
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24. Country Policy and Institutional Assessment and IDA Country Performance Ratings	18
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28. CSGR Globalisation Index	20
29. Dashboard of Sustainability	21
30. Democracy Score (Nations in Transit Ratings)	21
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32. Ducoire / Delcredere Country Risks	22
33. Early Motherhood Risk Ranking	23
34. Ease of Doing Business	23

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36. Ecological Footprint	2
37. Economic Freedom of the World (EFW) Index	2
38. Economic Vulnerability Index	2
39. Education for all Development Index (EDI)	2
40. E-Government Index	2
41. E-Government Readiness Index	2
42. EIU Business Environment Rankings	2
43. EIU Country Risk Rating	2
44. EIU World Wide Cost of Living Index	2
45. Emerging Markets Bond Indices	3
46. Environmental Degradation Index (EDI)	3
47. Environmental Performance Index (EPI)	3
48. Environmental Sustainability Index (ESI)	3
49. Environmental Vulnerability Index (EVI) (in process)	3
50. E-Participation Index	3
51. E-Readiness Rankings	3
52. ERG Country Classification	3
53. Ethics Indices	3
54. Ethno-linguistic and Religious Fractionalization Index and Political Instability Index	3
55. Eurochambres Economic Survey (EES) Indicators	3
56. European Innovation Scoreboard (EIS) and Summary Innovation Index (SII)	3
57. Failed States Index	3
58. Financial Times Credit Ratings	3
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60. Forbes Capital Hospitality Index (FCHI)	3
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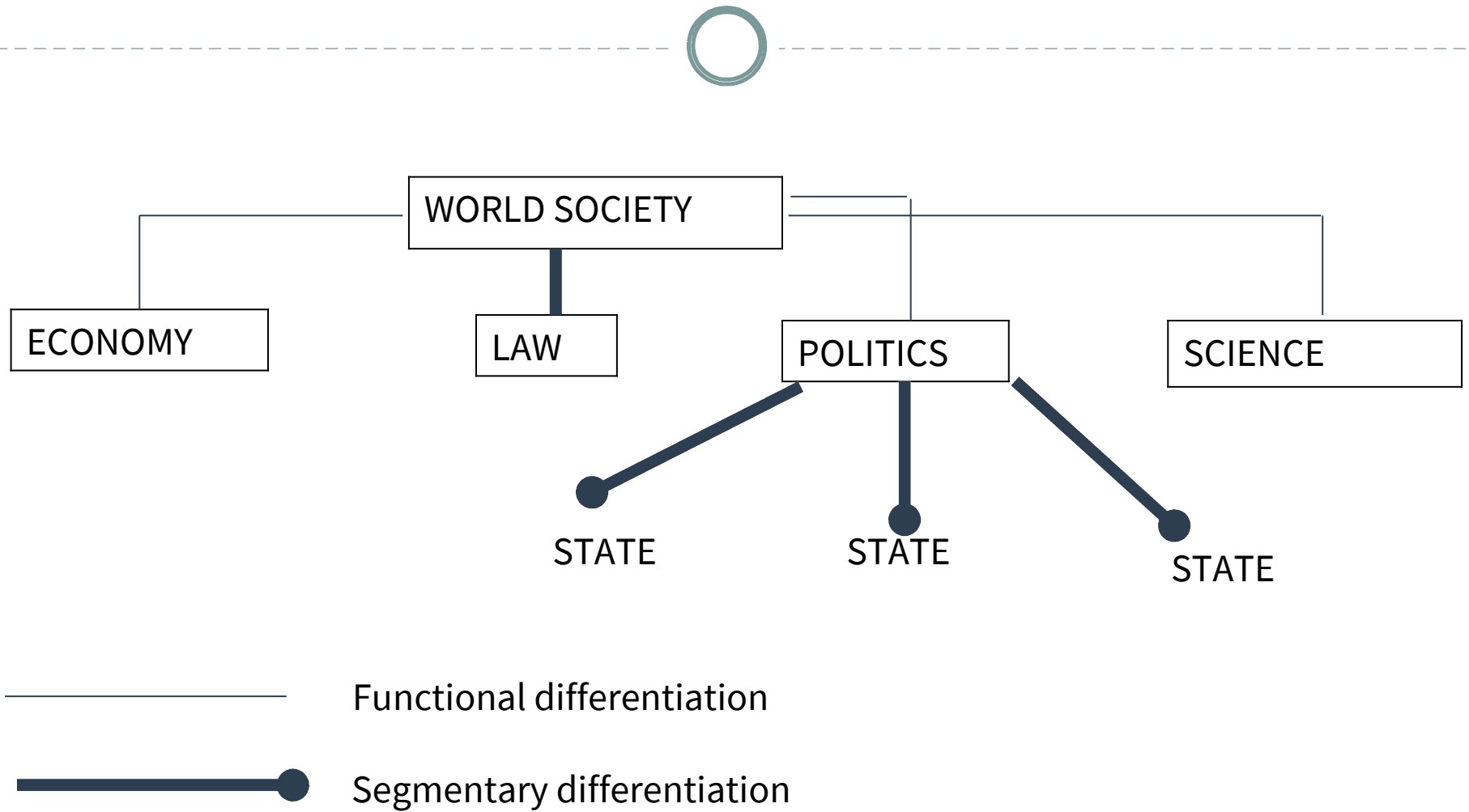
Plenty of indices 2 (Bandura 2008)



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Structural differentiation of contemporary (world) society



Structural differentiation of societies



Equal		
	+	-
Similar	<div>+</div> <div>Segmentation</div> <div>(Families, tribes, nations, etc.)</div>	<div>Centralization</div> <div>(Civilizations, empires, etc.)</div>
	<div>-</div> <div>Functional Differentiation</div> <div>(Economy, Science, Art, etc.)</div>	<div>Stratification</div> <div>(Castes, estates, classes, etc.)</div>

Source: Roth, S and A. Schütz. 2015. « Ten Systems: Toward a Canon of Function Systems. ». *Cybernetics and Human Knowing*. Vol. 22 (2015), no. 4, pp. 11-31 , p.16.

Indicators and globalization. The self-description of world society



- The multiplication of indicators is correlative to globalization as the self-description of world society.
- Difference between first order and second order observation of globalization.
 - 1st order: what **is** globalization, when did it **really** start, etc.
 - 2nd order observation : we observe that observers observe nowadays with the distinction Global/Local.
- Global Indicators give information on both the converging AND the diverging of the national states providing observations on both redundancy and variability (stability and evolutionary potential).

World Society describes itself as global



G-Index (Globalization Index)
G-Index (Globalization Index)-2

Foreign Policy and AT Kearney
World Markets Research Centre (WMRC)

Global Civil Society Index (GCSI)
Global Climate Risk Index

The Centre for the Study of Global Governance – London School of Economics
Germanwatch

Global Competitiveness Index
Global Entrepreneurship Monitor

World Economic Forum (WEF)
Babson College and London Business School

Global Hunger Index (GHI)
Global Integrity Index
Global Investment Prospects Assessment (GIPA)

International Food Policy Research Institute (IFPRI)
Center for Public Integrity
UNCTAD

Global Natural Disasters Risk Hotspots
Global Peace Index (GPI)
Global Production Scoreboard
Global Quality of Living
Global Retail Development Index (GRDI)

Center for Hazards and Risk Research (Columbia University) and Hazard Management Unit (World Bank)
the Economist Intelligence Unit's Country Analysis
Global-production.com
Mercer Human Resource Consulting
AT Kearney

Global Risk Service
Global Terrorism Index

Global Insight - WMRC
World Markets Research Centre (WMRC)

The World Economical System observes the Political (and Law) Systems



- Sovereign Credit Rating [Capital Intelligence Economy]
- Sovereign Credit Rating [FitchIBCA Duff & Phelps Economy] (1924)
- Sovereign Credit Rating [Moody's Economy] (1914)
- Country Performance Assessment (CPA) [Asian Development Bank]
- World Governance Assessment [Overseas Development Institute (ODI)]
- Governance Indicators [World Bank Institute]
- Foreign Direct Investment Confidence Index [AT Kearney - Global Business Policy Council]
- Index of State Weakness in the Developing World [Brookings Institution]
- Country Risk Rating [World Markets Research Centre (WMRC)]

The Global-Local distinction

The world political society's
point of view

GLOBAL

The national state's point
of view

LOCAL

GLOBAL
(The world)

For the world, the marked side is the global.

For the self-observation of the national state as part of the world political system, the marked side is the local (itself).
BUT with respect to its own sub-systems, the National State sees itself as global and themselves as local.

=> The global/local distinction is a recursive one with inversions of the marked/ unmarked sides at each change of level.

The local is the non-commensurate, what resists commensuration. It is always relative to the perspective.

The world society observes itself



**REDUNDANCY AND VARIETY IN THE WORLD
POLITICAL SYSTEM.
THE IMPORTANCE OF COMMENSURABILITY**

Functionals Systems



System	Function	Efficacy	Code	Program	Organizations
Law	Elimination of the contingency of normative expectations	Regulation of conflicts	Legal/illegal	Laws, constitutions, Etc.	Courts
Politics	Making collectively binding decisions	Practical application of collectively binding decisions	Government/opposition Power/no-power	Political parties' programs, Government's programs	Parties Administration
Science	Production of knowledge	Supply of knowledge	True/false	Theories, methods	Laboratories, universities
Religion	Elimination of contingency	Spiritual and social services	Transcendence/Immanence	Holy scriptures, dogmas	Churches, sanctuaries in general
Economy	Prevention of shortages	Satisfaction of needs	Payment/non-payment	Budgets Investments	Firms
Etc. (Mass media, Education, Health...)

Functional systems uses of indicators



- **USE of self-referential indicators:**
 - **self-description** the system observes itself and reduce its own complexity with indicators.
 - ✦ Economy: prices indices, Dow-Jones....
 - ✦ Science: h-index, G-index, impact factors,...
 - ✦ Politics: opinion polls
 - ✦ Media: audience
- **USE of other-referential indicators:** Reduction of the complexity of its environment for the system through indicators (Ex: GDP for the political system)
- **INFLUENCE:** Systems observe how they are observed by others systems (Ex: PISA for the educational system).

The Mass-Media



- « Whatever we know about our society, or indeed about the world in which we live, we know through the mass media ».
- The functions of the mass media:
 - - creating a common knowledge, what can be taken as known by everyone (but not a consensus) and therefore constitutes the background of all new communication;
 - Providing for the auto-description of society.
- **Mass Media like indicators** : what is nice for the mass media is that quantities can vary (even if substantially insignificantly) => newness at least cost. Still better if it combines with dissensus (climate change), disaster, etc. => dramatisation

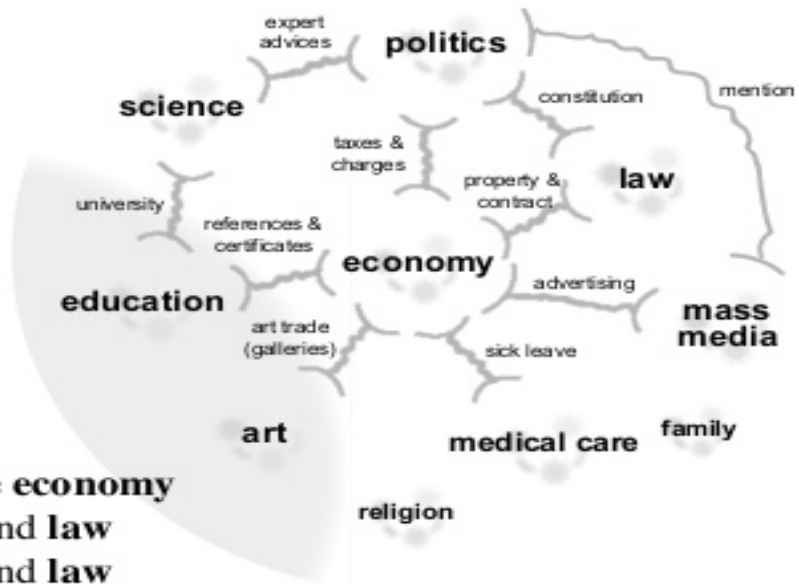
Other-reference indicators as structures of expectations and structural couplings



- Indicators when recurrent («Named» indicators) imply ongoing observations with the same distinction.
- This supposes that the system has established stable expectations with respect to its environment.
- It is natural to suppose that these expectations focus on the structural couplings of the system with its (social) environment which means other functional systems.

Structural Couplings

Structural Coupling between Functional Systems



Structures for Structural Coupling

taxes and charges between **politics** and the **economy**
constitutional authority between **politics** and **law**
property and contract between **economy** and **law**
references and certificates between **economy** and **education**
universities between **science** and **education**
expert advice between **science** and **politics**
advertising between **economy** and **mass media**
references between **politics** and **mass media**
art trade (galleries) between **art** and **economy**

by Niklas Luhmann

Source: Takashi Iba : « Sociological Perspective of the creative society ».
COINs16 - Collaborative Innovation Networks conference, Rome, Italy

Problems of structural couplings between science and politics



- **Scientification of politics:** The inherently limitless (over-)production of knowledge creates for politics technological potentials and/or political expectations, threats to legitimacy and, thus, imperatives to act (irritation of the political system by science). The **media** play an important role here as being coupled to both systems.
- **Politization of science:** The demand for knowledge to solve scientific/technical (instrumental) and/or obtain support for preconceived decisions (legitimizing) ultimately leads to the inflationary use of expertise and, as it pushes to the realm of yet uncertain knowledge, to controversy (irritation of science by politics).
- The (over-)supply of knowledge and its politicisation leads to de-legitimation of politics and loss of authority on the part of science. Thus, it creates imperatives of selecting among variants of expertise. This selection ***must operate internally to science...*** » (Weingart, P. (1999). « Scientific expertise and political accountability: paradoxes of science in politics.» *Science and Public Policy*, 26(3). 151-161).
- HOWEVER...in case of impossibility to resolve it internally, => Scientists turn to politics: **PARTICIPATION OF CITIZENS** (micro-publics) = scientification of politics again.

Structural couplings of science with politics, economy, education, the media...



What is wrong with evidence based policy, and how can it be improved?

Andrea Saltelli ^{a, b, c, d, e}, Mario Giampietro ^{a, c, d}

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<https://doi.org/10.1016/j.futures.2016.11.012>

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What is science's crisis really about?

Andrea Saltelli ^{a, b, c, d, e}, Silvio Funtowicz ^a

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<https://doi.org/10.1016/j.futures.2017.05.010>

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Highlights

- There is a crisis of science's governance forcing to reconsider evidence based policy as it is being practiced at present.
- The closure of any issue in a pre-established frame used for quantification may correspond to normative and political stances.
- The use of mathematical modelling and indicators conveys a spurious impression of precision, prediction and control.

Do PISA data justify PISA-based education policy?

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Highlights

- Science's crisis is real. A resolution is not in sight, but a Reformation is not impossible.
- The mainstream interpretation of the root causes of the crisis (perverse incentive, too many papers) is insufficient.
- The crisis is due to a transformed role: from emancipation and betterment of mankind to instrument of profit and growth

Scientists cannot resolve the problem alone and have high stakes in the preservation of the status quo.

Institutions are in denial pretending that current predicaments of science do not weaken its privileged role in governance.

Structural couplings between science and politics or hybridization ?



- « It has become fashionable to speak of a ‘blurring of the boundaries’ or of ‘hybridisation’. However, it is misleading as it incorrectly suggests that the functional differentiation between science and politics disappears. The novel aspect of the use of scientific expertise is the close coupling of science and politics. This coupling is dynamic in the sense that it is driven from both sides to become ever closer. »
(Weingart 1999: 157).
- BUT what about: Post-Normal science (Funtowicz & Ravetz), Mode 2 (Gibbons, Limoges, Nowotny & al.), Triple-Helix (Leydesdorf) ???

Summary: the functions of indicators depends on social structures



- For all: reduction of complexity (self and other-reference)
- For the (World) political society as segmentarily differentiated:
 - Construction of reality, self-description as global
 - Providing for both **redundancy** (same indicators for all States) and **variety** (differing patterns of values)
- For society as functionally differentiated:
 - Observing each other (1^{er} order) and observing being observed (2nd order)
 - Focus on structural couplings (?)
- For organizations :
 - Deparadoxisation of decisions
 - Uncertainty absorption