

## Society as a self-organising system

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### Abstract

This paper deals with the new paradigm of evolutionary systems thinking and self-organisation and the impact it might have on social sciences and humanities. It is argued that an as-yet-to-be-developed theory of social self-organisation would have the potential to overcome the cleft between the action- or subject-oriented approach and the approach that focuses on social structures let alone the cleft that separates it from (natural) science and engineering. Special attention is paid to the idea of a matryoshka-like architecture of society.

### 1 Social theories

There are conflicting paradigms throughout sociology, social sciences and humanities concerned with the description, explanation and prediction of human phenomena. The basic question to which they provide different solutions is how to theorise the relationship between individuals and society (see table 1).

	relationship between	
	individuals...	and society
individualism	suffice	results
structuralism, functionalism	result	suffices
individual–society dualism	independent	
individual–society dialectic, social system theory (self-organisation)	mutually dependent (society emerges from and shapes, in turn, individuals)	

Tab. 1: How social theories relate individuals and society

One possible answer to that question is individualism. Theories belonging to that kind of conceptualisation methodologically, ontologically and ethically give priority to individual action and related phenomena and postulate that societal facts and related phenomena are to be logically derived from the individual ones, are in a modular way built up by the latter ones and do not inhere values different from values on the individual level. The way of thinking underlying individualism is reductionism. Societal phenomena are reduced to phenomena on the individual level. Knowledge of individual phenomena suffices for getting knowledge of phenomena on the society level, the second results from the first. The most well-known example for individualism is rational-choice theory in economics. The whole paradigm often is labelled action theory or subject theory.

Contrary to individualism, there is „societalism“. This is the tradition that goes back to Emile Durkheim who insisted on the autonomous existence of social facts. Recent representatives of this variety are functionalist and structuralist theories. Starting point is dealing with social facts or social functions or social structures which is deemed sufficient to describe, explain or predict what is going on on the individual level. Instead of being reductionist, this way of thinking extrapolates or projects phenomena which are found on a higher level onto a lower level where these phenomena cannot be found.

Another solution offered similar to the previous one is to grant autonomous existence to phenomena of individuals and society respectively. Here individuals are cut free from societies and vice versa. In distinction to the monism of the two answers above, it is dualism. Niklas Luhmann's theory of social systems, e.g., is dualistic since his social systems (subsystems of society) are made up of communications only while the psychic systems (individuals) belong to the environment of the social ones.

It may be clear that none of these options may be preferred. It is the argument of this paper that generalising insights from self-organisation studies in science, that is, physics, chemistry, biology, and applying the generalisations to the human sphere promises to develop a post-Luhmannian social systems theory that does justice to the dialectical interplay of individuals and society. In that view individuals and society are not independent, but rather mutually dependent. Secondly, they are opposites and, thirdly, their relationship is asymmetrical.

## 2 Social self-organisation

The individual-society-dialectic can be cast in system-theoretical terms as follows (see figure 1).

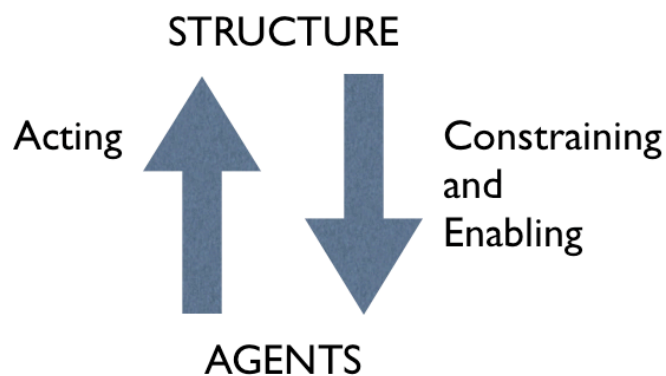


Fig. 1: Social self-organisation

Societal structures emerge from individual actions and individual actions are shaped by societal structures. There are two levels. At the micro-level the elements of the system, namely actors, are located. They carry out actions, and by the interplay of the fluctuating individual actions, they design fairly stable relations among them which gain a relative independence from the interactions. Structures like that emerge thus on a macro-level, where they exist in their own right insofar as they, in turn, influence the actors. On the one hand, they constrain the individual agency by setting conditions that limit the scope of possibilities to act and, on the other, just by doing so provide it with the potential for realising options it would not otherwise have. The impact of the structures is a constraining and enabling one. In so far as the structures do not cause directly, and therefore cannot determine completely whether or not these options will be realised, for the actions are mediated by the individual actors, dominance cannot control the outcome, either. The structures are inscribed in the individual actors by an endless process of socialisation and enculturation, but the engramms which are produced in the individuals serve as informational tools for the anticipation and construction of ever new actions which may or may not reproduce the structures. Either way, interaction reflects upon the conditions of its own emergence and may consciously be directed at the structures in order to maintain or alter them. In this sense only, that is, because in their recursive actions the actors refer to the structures, these structures play the dominant role in this relation of bottom-up and top-down causation. Nevertheless none of the relations in this causal cycle leads to plain results. Each influence has consequences which due to the inherent indeterminacy cannot be foreseen. By this, and only by this, qualitative change is possible.

Thus, individuals and society are interdependent (none of them can be understood without the other), they oppose each other (none of them is fully understandable by understanding the

other), and they build a hierarchy (society plays the dominant role). They form parts and a whole.

### 3 Social subsystems

It is a commonplace to differentiate between subsystems of society like technology, ecology, economy, politics, culture. In Luhmann's theory they are independent systems located, so to say, on the same level.

Self-organising systems, however, may form a nested hierarchy. According to the view supported here, the build-up of order by using free energy which is characteristic of the most simple physical self-organising system (see figure 2) differentiates in the concatenation of two self-organising cycles in which structures and functions respectively are produced in biotic systems (see figure 3).

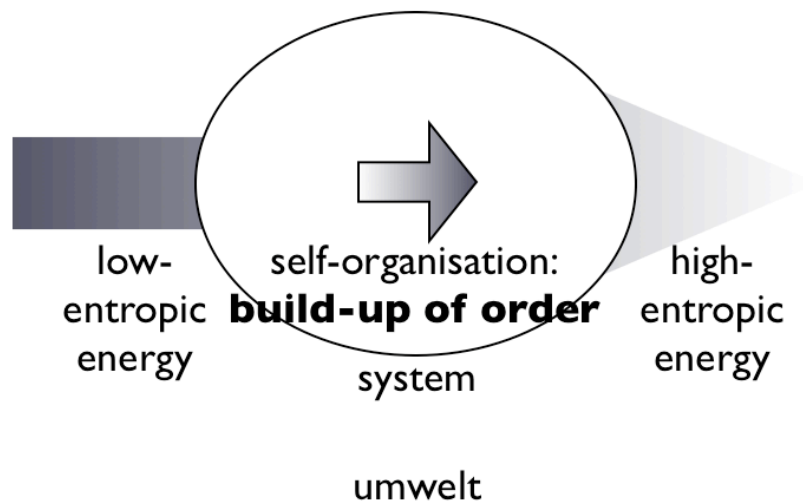


Fig. 2: One-levelled architecture in physically self-organising systems

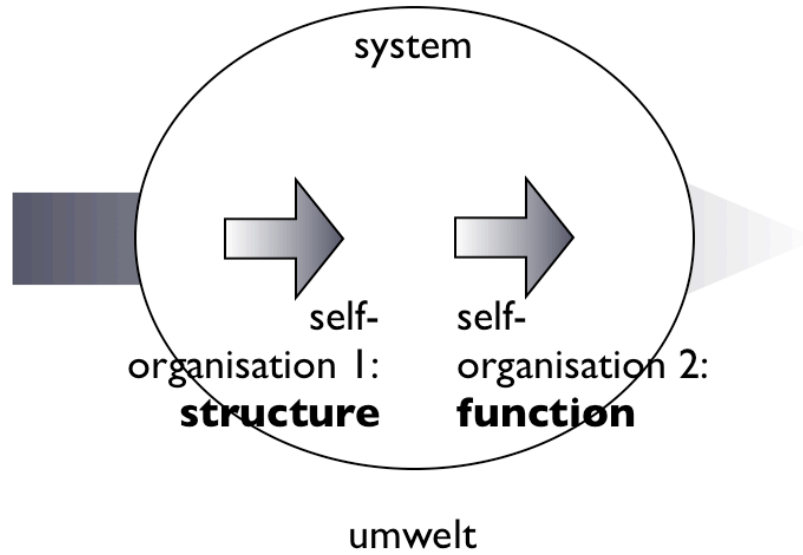


Fig. 3: Two-levelled architecture in biotic systems

With the advent of human systems, this two-levelled architecture is seen to give way to a three-levelled architecture in which self-organisation cycles that produce means, ways and goals form encapsulated systems (see figure 4).

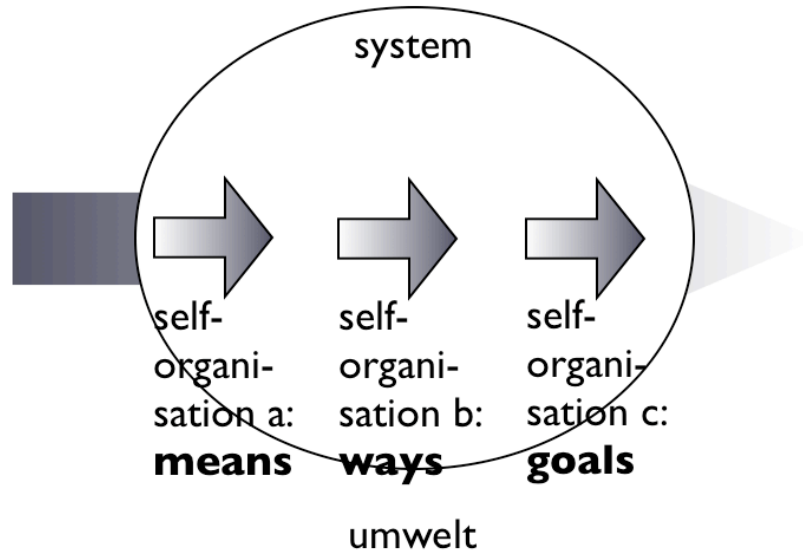


Fig. 4: Three-levelled architecture in human systems

Thus, at a first glance, you can distinguish three main spheres that form the layers of a hierarchical society system: the technosphere is enclosed by the ecosphere and the ecosphere by the sociosphere (see figure 5).

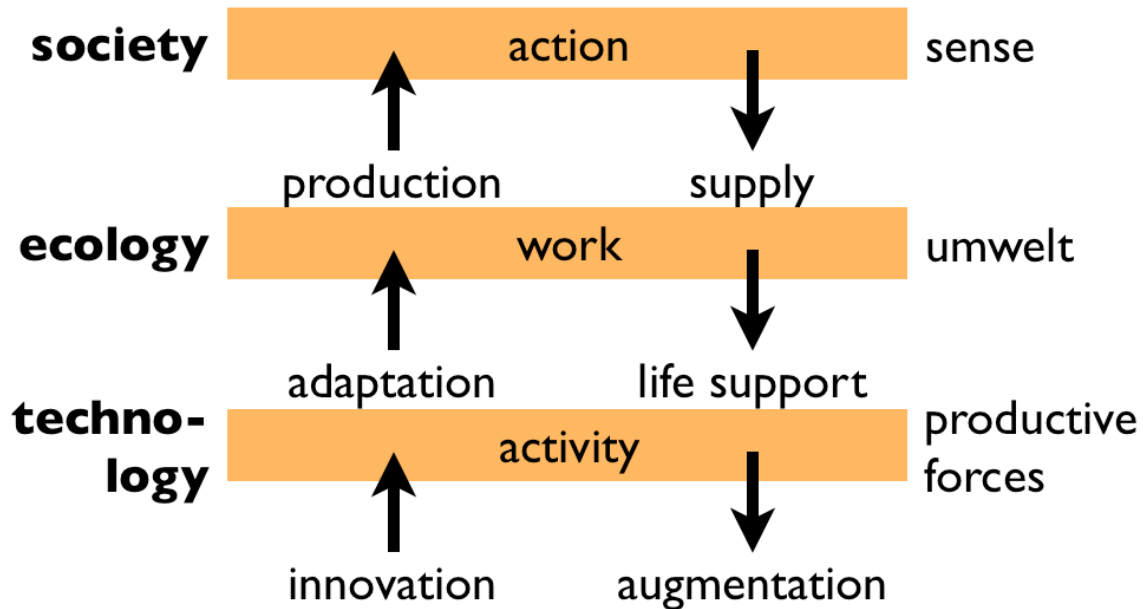


Fig. 5: Social subsystem levels I

The technosphere is the sphere in which means are produced, that is, in which human beings are active in innovating and applying scientific-technological tools in the course of social life. A means is a medium, in that it mediates between the starting point and the desired result, regardless of what sort of action is involved. An infrastructure of tools, methods and capabilities which comprise the overall forces of the socially living humans is the base of human systems. Technology is to augment the actors that take the role of productive forces in that they produce something when they aim at something. The technosphere is the sphere in which the actors of society carry out their instrumental activities. Instrumental activities are the use of technologies as well as the creation of new technologies.

The ecosphere is the sphere in which ways are produced, that is, in which human beings work, in other words, where they use their tools, methods and capabilities to adapt nature to themselves in order to survive and construct an *umwelt*, where they objectify the life-support conditions of nature and appropriate nature to assure them of life support. Human living beings restructure nature in order to be able to appropriate it in the way they require. Contrary to all the other life forms on our planet, humans are able to consciously design their metabolism and to produce their *umwelt* whenever nature itself is not capable of reproducing itself for the sake of humans.

The sociosphere as a whole is the sphere in which goals are produced. It's the sphere in which human beings perform social actions. Here they constitute what makes sense to them and realise it. Sense is then another of the higher qualities brought forth by the specific self-organisation of human systems. In fact, it is the result that constitutes the *differentia specifica* to nonhuman biotic systems. Tangibles and intangibles (goods, be they material or

immaterial) are produced and consumed. Every social being is called to co-design the collective in which the supply of the goods is provided.

Upon closer scrutiny, the constitution and realisation of sense can be differentiated further. Usually economy, politics and culture are the realms in which sense is produced by social actions. Thus the sociosphere is the sphere in which the actors as social beings construe social relations concerning resources (economy), regularities (polity) and rules (culture). They dispose over resources, decide on life conditions that form regularities of the living together and define rules like norms and values (see figure 6).

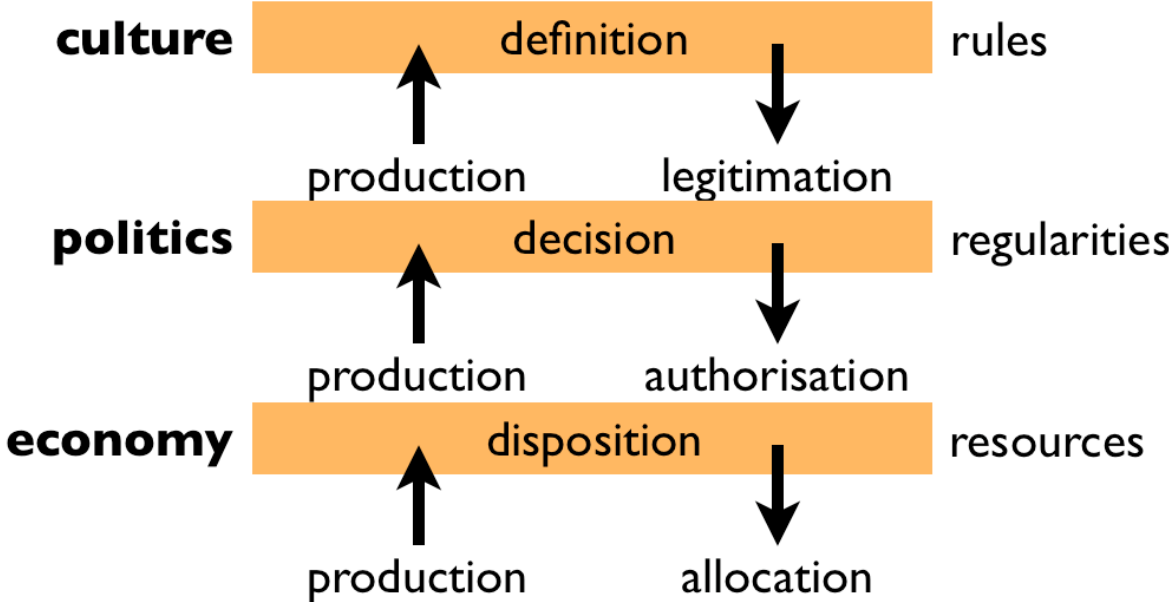


Fig. 6: Social subsystem levels II

Economy means a dual process of production and allocation. Material resources that are vital to society are produced by making use of the system of productive forces. On the other hand, resources are utilised in order to ensure the preservation of the members of society in a process of allocation of economic goods. The social relationships that emerge here and channel the self-preservation of the actors are property relations – property being the disposition of resources. According to the power of disposition resources are allocated to the actors, that is, goods are distributed to them.

Politics deals with decisions which refer to the way life conditions are set (including how economic resources are being used and how they are distributed). Decisions are made on the basis of available resources in order to assure the functioning of society. Politics is about power, namely, power of decision. The disposal of means of power represents regularities of how actors pursue interests. By resorting to power actors are authorised to determine themselves.



Culture can be seen as the subsystem of society in which ideas, views, social norms, and social values are defined within the framework of habits, ways of life, traditions, and social practice. Culture encompasses a dual process of defining the rules and being legitimised by observing the rules. On the one hand social norms, values, ethics and morals are constituted and differentiated in relation to decisions already reached. On the other hand, social norms legitimise acts of the members of society. It is the field of discourse in which the actors can express themselves as long as they happen to gain influence by sharing the power to define the rules.

The architecture of society, then, is made up of a series of encapsulated systems each of which is a manifestation of the basic cycle of agency and structure described in section 2.

### Summary

In section 1 a classification of social theories is introduced that focuses on the individual-society-relationship. Section 2 shows how dialectical thinking in social sciences and humanities can avoid falling into the traps of reductionism, projectionism or dualism. Section 3 gives an account of a possible way of a concise and stringent general conceptualisation of how different societal areas tie in with each other which at the same time is open to concretisation.

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