Some Implications of Anthony Giddens’ Works for a Theory of Social Self-Organization

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Anthony Giddens’ structuration theory fits into the framework of a dialectical theory of social self-organization. The sciences of complexity and the theory of self-organization suggest a dialectic of chance and necessity in the natural and social world, as well as a dialectical relationship of human beings and society. The theory of self-organization has led to a change of scientific paradigms, from the Newtonian paradigm to the approaches of complexity. There is a shift from predictability to nonpredictability, from order and stability to instability, chaos, and dynamics; from certainty and determination to risk, ambiguity, and uncertainty; from control and steering to self-organization of systems; from linearity to complexity and multidimensional causality; from reductionism to emergentism; from being to becoming; and from fragmentation to interdisciplinarity.

In self-organizing systems one not only finds complex and multidimensional causality, such systems are by definition also circular causal. Circular causality involves a number of processes \( p_1, p_2, \ldots, p_n \) (\( n \geq 1 \)) and \( p_1 \) results in \( p_2, p_2 \) in \( p_3, \ldots, p_{n-1} \) in \( p_n \) and \( p_n \) in \( p_1 \). A simple example of this has been described by Manfred Eigen in what he calls a hypercycle (Eigen & Schuster, 1979). Speaking philosophically, it can be said that all self-organizing systems are circular causal because such a system is reason and cause of itself. It is not in need of other concepts to be explained, it is its own reason (\textit{causa sui}), its essence involves its own existence. Friedrich Wilhelm Schelling pointed out that the whole universe and nature have their reality in themselves and are their own products. The evolution of the universe has its own reason; such arguments do not have to refer to some God-like, external creator, a mover who is not moved himself.

The new sciences of complexity do not simply substitute determinism by complete indeterminism and do not suggest that all evolutionary processes (in the universe, nature, and society) are completely governed by chance (this would also have to result in a dismissal of the human capability of intervention and systems design that can increase the possibility that a system will develop in a desirable way). Rather, they suggest a dialectic of chance and necessity: There are certain aspects of the behavior of a complex system that are determined and can be described by general laws, whereas others are governed by the principle of chance.

A system has inputs that are transformed into outputs as well as parts, structure, behavior, states, a border, and an environment from which it differs and with which it interacts. The parts can be considered as the micro level, the whole—which refers to behavior, state, and structure; that is, the relationships and interactions between the parts—as the macro level.

Self-organization in a systems hierarchy means that in an upward process a system is linked to a supersystem by emergence; that is, new features appear at the upper level (supersystem) that cannot be reduced to the lower one. This kind of emergence is accompanied by a downward process, which is a kind of domination or assertion of superiority.

The levels in question may also be referred to as system and subsystem levels. Emergence as an upward loop of self-organization cycles effects the progression from one system level to a higher system level in encapsulated systems. It propels the structural buildup of systems. This type of emergence, which refers to the relationship of a whole and its parts or the micro and the macro level of a system, can be called \textit{synchronous emergence} (Fuchs et al., 2002; Hofkirchner, 2001).

\textit{Diachronic} emergence refers to a historical sequence of systems or system types. In the course of evolution one system is linked to another—the old to the new—by emergence; that is, the first one gives rise to the second. As a result, a hierarchy of system types with increasing complexity shows up. Looking at evolution shows that thus far social systems form the upper level of this hierarchy. One level below we find autopoietic, that is, living systems and at the bottom dissipative, that is, physicalchemical systems.

Both types of emergence have in common the fact that at a higher level qualities result from temporal and spatial differentiation of a system and are not reducible to the level underneath. Interactions result in new properties that cannot be fully predicted and cannot be found in the qualities of the system on the lower level. Synchronous emergence refers to the permanent self-reproduction of a system. For example, society is a permanently innovating network and can only exist and create itself by innovation. Diachronic emergence is more than self-reproduction because in such processes a new type of system appears. These two types of emergence are connected in such a way that synchronous emergence from time to time results in instabilities and phases of multifurcation. As a result of diachronic emergence that takes place in such a phase of instability, a new system type with its own mode of reproduction and synchronous emergence is established.

Both types of emergence can also be described by what Hegel called “sublation” (\textit{Aufhebung}). In German this term has three meanings: to eliminate, to preserve, and to lift something up. In synchronous emergence the parts are sublated: At the macro
level the parts are no longer present as single entities, that is, the micro level is eliminated; but due to their interconnectedness and their interactions the parts are also in a way preserved in the whole. The whole is more than the sum of its parts, hence it is a higher level than the micro level. In diachronic emergence, an old system (type) or hierarchy of systems is eliminated and followed by a new one, old systems are preserved in new ones, and there are emergent qualities and levels (a new system type) of the hierarchy.

What is called emergence of order, production of information, or symmetry breaking in self-organization theory corresponds to Hegel’s notions of sublation and negation of the negation. Some of the examples mentioned by Hegel in his Encyclopaedia of the Philosophical Sciences (Hegel, 1874) and by Engels in his works Anti-Dühring (Engels, 1878) and Dialectics of Nature (Engels, 1886) for describing the dialectic development process of nature and society could equally be described with the concepts of self-organization theory such as control parameters, critical values, bifurcation, emergence, symmetry breaking, meta-system transition, and so on (Fuchs, 2002f). A close relationship between dialectics and emergence/self-organization has been assumed in several works about philosophical aspects of self-organization (Buhr & Hörz, 1986; Dobronravova, 1997; Fuchs, 2002; Hofkirchner, 2002; Hörz, 1993; Naser, 1994; Schlemm, 1996, 1999; Steigerwald, 2000). Both dialectics and self-organization theory stress the process structures of the world and ways of thinking of the relationship between the old and the new that resemble each other.

### FUNCTIONALISM AND DUALISM IN SOCIAL SYSTEMS THEORY

Functionalism tries to study social systems synchronically in a sort of timeless snapshot, but in reality a social system does only exist in and through its reproduction in time. Functionalism is also unable to see human beings as reasoning, knowledgeable agents with practical consciousness and argues that society and institutions have needs and fulfill certain functions. This sometimes results in views of a subjectless history driven by forces outside the actors’ existence and of which they are wholly unaware. The reproduction of society is seen as something happening with mechanical inevitability through processes of which social actors are ignorant. Functionalism and structuralism both tend to express a naturalistic and objectivistic standpoint and emphasize the preeminence of the social whole over its individual, human parts. Hermeneutics and interpretive sociology see the material world and constraints as something outside the subjective experience, there is not much talk about structural concepts and constraints, and quite frequently sociality is reduced to individuality.

Bridging strict oppositions and avoiding dualistic conceptions is one of the main aims of Giddens’ theory of structuration. Giddens has not commented a great deal on Niklas Luhmann’s theory of self-reference, but much of what he says about functionalism is also true for Luhmann’s conception of society. This is especially the case for Luhmann’s conception of society without human, knowledgeable agents. In his main work The Constitution of Society, Giddens refers to Luhmann as one of the representatives of neo-Parsonianism whose work is sophisticated and important, but nonetheless an example of the failures of functionalism. One of Giddens’ declared aims is to refute functionalism.

Society is a complex, self-organizing system. This suggests that the foundational problem of sociology of how structures and actions as well as society and the human being are related should not be resolved in a determinist manner. As shown by Giddens, pure structuralistic conceptions arguing that social systems can be explained as the influence of social structures on actions and thinking, as well as pure action-based conceptions that explain social systems as the differentiation of structures resulting from human actions, do not take into account this complex nature of society. The problem of how structures and actions are related is resolved in favor of either one of these categories, whereas the thinking in terms of complex and multidimensional causality that is put forward by the new science of self-organization suggests a dialectic of structures and actions, (social) system and human being.

Niklas Luhmann is the main sociological representative of the new sciences of complexity. He failed to incorporate adequately the conceptual apparatus supplied by the philosophical implications of self-organization theory that could help overcome dual oppositions and dualistic conceptions in the social sciences. Luhmann (1984) conceives of society in functional terms, applies Maturana’s and Varela’s autopoiesis concept sociologically, and sees society as a self-referential system with communications as its elements. Luhmann says that a system can only differentiate itself if it refers to itself and its elements. It generates a description of itself and a difference between system and environment. Self-observation means that a system/environment difference is introduced into the system. All social systems can observe themselves.

Luhmann argues that individuals are (re)produced biologically, not permanently by social systems. If one wants to consider a social system as autopoietic or self-referential, the permanent (re)production of the elements by the system is a necessary condition. Hence Luhmann says that not individuals but communications are the elements of a social system. A communication results in a further communication and by the permanent (re)production of communications a social system can maintain and reproduce itself.
Social systems use communications as their particular mode of autopoietic reproduction. Their elements are communications which are recursively produced and reproduced by a network of communications and which cannot exist outside such a network. (Luhmann, 1988: 174)

For Luhmann, human beings are sensors in the environment of the system. He says that the “old European humanistic tradition” conceives of humans as within and not on the outside of social systems. Systems theory would have no use for the subject and the human being could not be the measure/standard of society. He stresses (communicative) processes instead of individuals.

Luhmann resolves the sociological problem of how social systems and human beings are related dualistically, which results in inconsistencies and theoretical lacks. He cannot explain how one communication can exactly produce other communications without individuals being part of the system:

There is no significant attempt to show how societal communication ... emerges from the interactions of the human beings who ultimately underpin it. Without human activity there would be no communication ... It is one thing to say analytically that communications generate communications, but operationally they require people to undertake specific actions and make specific choices ... One communication may stimulate another, but surely it does not produce or generate it. (Mingers, 1995: 149f)

Beermann (1991: 251) says that one could think of social systems as basal self-referential if there is not a self-reference of communications, but the reference of actions to persons. An autopoietic conception of society must consistently show that, as well as how society produces its elements itself. Beyerle (1994:137f) criticizes the fact that Luhmann does not show how communications are produced; he only mentions that communications result in further communications. He can explain that society is selfreferential in the sense that one communication is linked to other ones, but he cannot explain that it is self-producing or autopoietic.

Luhmann does not conceive of society as a dialectic of social structures and human beings, as suggested by Giddens’ theory of structuration as well as the philosophical implications of the new sciences of complexity. He states that he is opposed to traditional western science, but as is frequent in the dominating line of the western worldview (see Jantsch, 1975) he solves the tension between opposites one-sidedly, not in terms of a unity or synthesis of the opposites.

STRUCTURATION THEORY AND SOCIAL SELF-ORGANIZATION

Structuration theory holds that the rules and resources drawn on in the production and reproduction of social action are at the same time the means of system reproduction (Giddens, 1984: 19). In this respect, human social activities are recursive because they are continually recreated by the actors whereby the latter express themselves as actors. Social structures do not exist outside of actions, they are “rules and resources, or sets of transformation relations, organised as properties of social systems” (ibid.: 25). In and through their activities agents reproduce the conditions that make these activities possible (ibid.: 2). “According to the notion of the duality of structure, the structural properties of social systems are both medium and outcome of the practices they recursively organise” (ibid.: 25) and they both enable and constrain actions (ibid.: 26).

Rules of social life can be regarded as techniques or generalizable procedures applied in the enactment and reproduction of social practices. Those rules that have to do with the reproduction of institutionalized practices are the ones most important for sociology. Giddens defines the characteristics of these rules as intensive vs. shallow, tacit vs. discursive, informal vs. formalized, weakly vs. strongly sanctioned. Signification, domination, and legitimation are the three structural dimensions of social systems in the theory of structuration. Domination would depend on the mobilization of the two types of resources:

Allocative resources refer to capabilities—or, more accurately, to forms of transformative capacity—generating command over objects, goods or material phenomena. Authoritative resources refer to types of transformative capacity generating command over persons or actors. (Giddens, 1984: 33)

Allocative resources involve material features of the environment, means of material production and reproduction, and produced goods, whereas authoritative resources involve the organization of social time-space—temporal-spatial constitution of paths and regions—the production/reproduction of the body—organization and relation of human beings in mutual association—and the organization of life chances—constitution of chances of self-development and self-expression (Giddens, 1984: 258; Giddens, 1981: 51f).

The continuity of social reproduction is based on the duality of structure and with it the reflexive monitoring of social activity by agents. Intentional activities are necessary for social reproduction, but not all consequences of their actions can be foreseen by the actors; that is, there are also unintended and unexpected aspects of human activity. Social systems involve social
relationships reproduced across time and space and structures are moments recursively involved in the (re)production of social systems (Giddens, 1981: 26).

Ordinary life is made possible by ontological security that is based on the routinization of actions and is made to happen by the actors' reflexive monitoring of their actions (Giddens, 1984: 60-64). Actors are situated and positioned in time-space (ibid.: 83-92); that is, they have social identities that carry with them certain prerogatives and obligations. Such identities are, for example, age and sex. The positioning of actors within certain social frameworks and in respect to rules allows the routinization of actions. Institutions are the more enduring features of social life; that is, "practices which 'stretch' over long time-space distances in the reproduction of social systems" (Giddens, 1981: 28). Giddens says that symbolic orders, forms of discourse, and legal institutions are concerned with the constitution of rules, political institutions deal with authoritative resources, and economic institutions are concerned with allocative resources.

The reproduction of society is based on human practices (Giddens, 1984: 26-8, 375f). Actors reflexively monitor their actions; that is, human behavior has an intentional and purposive character. However, there are also unintended consequences of actions that by way of causal feedback loops form unacknowledged conditions of further actions. Society is a social system where structural principles serve to produce a clustering of institutions across time and space; an association between the social system and a specific locale or territory can be found; normative elements exist that help to lay claim to the legitimate occupation of the locale; and there is some sort of common identity among the members of the society that does not necessarily involve a value consensus (Giddens, 1984: 164f).

I suggest that integrating aspects of the theory of structuration into a theory of social self-organization can help to avoid the dualistic shortcomings and the neglect of the human subject that still dominate conceptions of social self-organization. Conceptual affinities between Giddens' theory and the philosophical assumptions of self-organization theory as outlined above are quite obvious: Giddens is describing society in terms of mutual and circular causality and he is critical of reductionism. He has understood that conceptions that place a totality above its moments, reduce the totality to its moments, or conceive of the relationship of a totality and its moments as a dualistic one do not help in describing complex systems adequately. The concept of the duality of structure grasps the dialectical and complex nature of society and overcomes the structure/actor dichotomy that has long dominated the social sciences and that in systems theory has especially been sustained by Niklas Luhmann.

That theories of self-organization and structuration theory are conceptually close has sometimes been acknowledged (Mingers, 1995, 1996, 1999, 2001; Küppers, 1999). Both structuration theory and concepts of self-organization "place the production and reproduction of systems at the center of their theories, in particular the idea that systems can be recursively self-producing" (Mingers, 1995: 136). Mingers (1999) says that Maturana's and Giddens' theories are highly compatible:

Maturana’s natural social systems are Giddens’ institutions within the social system, and Maturana’s social organization is Giddens’ structure. Both envisage similar closed relations between the two—for Giddens, system interaction reproduces social structure which enables interaction; for Maturana, system interaction constitutes social organization which selects interaction. (Mingers, 1996: 477)

Küppers (1999) argues that uncertainty is the driving power of social dynamics that forces individuals to reduce it by producing rules of interaction. By cooperation and communication, local interactions would produce global structures that regulate uncertainty and are emerging patterns of interaction. The global structures would regulate uncertainty and thereby influence local interactions and the reproduction of local interactions. In this process of social self-organization, global structures would emerge from local interactions by circular causality.

Küppers speaks of circular causality and a reduction of uncertainty, but does not mention that structures enable and constrain social interaction. Uncertainty seems to be a category that has an independent existence outside of human actions. Küppers speaks of certain functions that uncertainty fulfills and does not see uncertainty as a phenomenon arising from social actions that only exist through and within social relationships. In line with functionalist conceptions of society, he argues that the structural properties of society (in his conception a set of rules concerning economic exchange, sanctions in hierarchies, and solidarity in groups) exist outside local interactions as external principles on a macro level. Giddens has shown that such dualistic conceptions do not adequately reflect the importance of reasoning, knowledgeable agents in society, or the fact that structures only exist within and through human practices. Nonetheless, Küppers’ conception is important because it shows that circular causality and emergence play an important role in the self-reproduction of social systems.

Saying that social self-organization means the self-reproduction of a social system implies that one must specify what is being reproduced. Applying the idea of self-(re)production to society means that one must explain how society produces its elements permanently. By saying that the elements are communications and not individuals as Luhmann does, one cannot explain self-reproduction consistently because not communications but individuals produce communications. One major problem of applying auto-poiesis to society is that one cannot consider the individuals as components of a social system if the latter is auto-poietic.

If human beings are taken as the components of social systems, then it is clear that they are not produced by such systems but...
Emergence: Complexity and Organization

Applying autopoiesis nonetheless to society will result in subjectless theories. Thus, Luhmann cannot explain how individuals (re)produce social structures and how their sociality is (re)produced by these structures. Neither assuming that society is a self-referential communication system nor describing society in terms of biological reproduction provides us with an adequate idea of how the self-reproduction of society takes place. Society can only be explained consistently as selfreproducing if one argues that man is a social being and has central importance in the reproduction process. Society reproduces man as a social being and man produces society by socially coordinating human actions. Man is creator and created result of society, and society and humans produce each other mutually. Such a conception of social selforganization acknowledges the importance of human actors in social systems and is closely related to Giddens' duality of structure. Saying that man is creator and created result of society corresponds to Giddens' formulation that in and through their activities agents reproduce the conditions that make these activities possible (Giddens, 1984: 2).

The individual is a social, self-conscious, creative, reflective, cultural, symbols- and language-using, active natural, laboring, producing, objective, corporeal, living, real, sensuous, anticipating, visionary, imaginative, designing, cooperative, wishful, hopeful being that makes its own history and can strive toward freedom and autonomy.

Marx (1858/59: 8) wrote: “In the social production of their existence, men inevitably enter into definite relations, which are independent of their will.” For economic relationships this is surely true. However, there are also social relationships, such as cultural ones, where humans often can choose whether they want to enter them or not. For example, I cannot choose if I want to enter a labor relationship because I have to earn a living, but I can choose which political party I want to belong to and which cultural relationships I want to enter. So one can say that concerning the totality of society, individuals enter social relationships that are partly independent and partly dependent on their will. By social actions, social structures are constituted and differentiated. The structure of society or a social system is made up by the total of normative behavior.

By social interaction, new qualities and structures can emerge that cannot be reduced to the individual level. This is a process of bottom-up emergence that is called agency. Emergence in this context means the appearance of at least one new systemic quality that cannot be reduced to the elements of the systems. So this quality is irreducible and it is also to a certain extent unpredictable; that is, the time, form, and result of the process of emergence cannot be fully forecasted by taking a look at the elements and their interactions. Social structures also influence individual actions and thinking. They constrain and enable actions. This is a process of top-down emergence where new individual and group properties can emerge. The whole cycle is the basic process of systemic social self-organization that can also be called recreation, because by permanent processes of agency and constraining/enabling a social system can maintain and reproduce itself (see Figure 1). Again and again it creates its own unity and maintains itself. Social structures enable and constrain social actions as well as individuality and are a result of social actions (which are a correlation of mutual individuality that results in sociality).

Recreation denotes that individuals who are parts of a social system permanently change their environment. This enables the social system to change, maintain, adapt, and reproduce itself. What is important is that the term recreation also refers to the ability of all humans consciously to shape and create social systems and structures, an ability that is based on self-consciousness and, in Giddens' terminology, the reflexive monitoring of action. As Jantsch says, social systems are reproductive ones because they can create new reality (Jantsch, 1979/92: 305); the sociocultural human being has the ability to create the conditions for his further evolution all by himself (ibid.: 343). Creativity means the ability to create something new that seems desirable and helps achieve defined goals. Man can create images of the future and actively strive to make these images become social reality. Individuals can anticipate possible future states of the world, society as it could be or as one would like it to become; and they can act according to these anticipations. Man has ideals, visions, dreams, hopes, and expectations based on the ability of imagination that helps him to go beyond existing society and create alternatives for future actions. Based on creativity, man designs society (see Banathy, 1996). Design is a future-creating human activity that goes beyond facticity, creates visions of a desirable future, and looks for a solution to existing problems. Design creates new knowledge and findings. Man designs machines, tools, theories, social systems, physical entities, nature, organizations, and so on within social processes.

Such an understanding of design as a fundamental human capability takes into account man's ability to have visions and utopias and actively to shape society according to these anticipated (possible) states of the world. It is opposed to an understanding of design as a hierarchical process and as the expert-led generation of knowledge about the world and solutions.
I have argued that Giddens' duality of structure as well as the notion of the recreation of society suggest a diachronic emergence of a new level is essential for social theory. This does not mean that social systems or structures are autonomous actors or subjects of social change. Structures do not act, they only exist within and through human social activities; hence when I am speaking of the social self-organization refers to the dialectical relationship of structures and actions that results in the overall reproduction of the system. The creativity and knowledgeability of actors are at the core of this process and secure the recreation of social systems within and through self-conscious, creative activities of human actors. A social system and its structures do not exist outside of human activities; structures are the medium and outcome of actions and this recursive relationship is essential for the overall recreation/self-reproduction of society. The term self-organization refers to the role of self-conscious, creative, reflective, and knowledgeable human beings in the reproduction of social systems.

By making a difference between homeostatic loops and reflexive selfregulation as two types of social reproduction, Giddens shows that circular causality and feedback loops are important for describing society. These are concepts that again show the close connection of the theory of structuration with philosophical and conceptual notions put forward by the theory of self-organization. Furthermore, these conceptions show that there are both intended and unintended consequences of human actions that are both fundamental for the reproduction of a social system. Actors have a certain knowledge of society that helps them in achieving goals and guaranteeing their survival in the social world. This knowledgeability is a fundamental precondition for the creativity of actors that makes possible the overall recreation of society. However, this overall reproduction depends also on unintended consequences of human actions. Human actions are neither unconscious bearers and executioners of structures, nor fully rational actors that can plan all aspects of social life. Social systems and their reproduction involve conscious, creative, intentional, and planned activities as well as unconscious, unintentional, and unplanned consequences of activities. Both together are aspects, conditions as well as outcomes, of the overall recreation/self-reproduction of social systems.

Saying that society is a recreative or self-organizing system the way we do corresponds to the notion of the duality of structure because the structural properties of social systems are both medium and outcome of the practices that they recursively organize and both enable and constrain actions.

Giddens has frequently stated that functionalist thought argues that certain institutions, structures, or systems work or function in certain ways. These entities are often described in analogy to organisms and the descriptions often convey the impression that structural entities work as autonomous agents or even subjects. It is true that the reproduction of society only takes place within and through human social activities; hence when I am speaking of the self-organization of a social system, I do not mean that social systems or structures are autonomous actors or subjects of social change. Structures do not act, they only exist within and through social actions, and the term social self-organization refers to the dialectical relationship of structures and actions that results in the overall reproduction of the system. The creativity and knowledgeability of actors are at the core of this process and secure the recreation of social systems within and through self-conscious, creative activities of human actors. A social system and its structures do not exist outside of human activities; structures are the medium and outcome of actions and this recursive relationship is essential for the overall recreation/self-reproduction of society. The term self-organization refers to the role of self-conscious, creative, reflective, and knowledgeable human beings in the reproduction of social systems.

Durkheim’s social facts have sometimes been interpreted as emergent properties of society because he says that social structures are different from individual consciousness and do not belong to the parts of society. Giddens is very critical of the notion of emergence because Durkheim’s implicit usage of the term conveys the impression that structures exist outside of and external to actions (Giddens, 1984: 169–74). Giddens furthermore says that Durkheim seems to argue that human actors are separated and come together ex nihilo to form a new entity. I have mentioned that emergence is an important notion in self-organization theory and that social structures and individual ideas and actions are properties of social systems that result from bottom-up and top-down emergence. Emergence in society refers to the fact that social reproduction takes place by the constitution of new social and individual properties that cannot be reduced to prior existing properties. This does not mean that emergent properties exist outside of or external to social activities; in fact emergent social properties in a structural sense are medium and outcome of social activities that can only exist due to the complex interactions of human beings and cannot be reduced to single actions or actors. In topdown processes there is the emergence of new aspects of actions and consciousness that is made possible by the enabling and constraining synergetic effects of social structures. These newly emerging properties cannot be reduced to single structural entities.

Recreation (in my terminology) and the duality of structure (in Giddens’ terminology) refer to the self-reproduction of society. As mentioned above, self-reproduction is based on synchronous emergence and new qualities on the macro level. There is no emergence of a new level, which would be a process of diachronic emergence, but emergence at a super level (the level of social structures) that sublates the micro level of a social system (the level of the individual actors). I will show below that the diachronic emergence of a new level is essential for social theory.

I have argued that Giddens’ duality of structure as well as the notion of the recreation of society suggest a dialectical relationship of structures and actors. One should clarify why exactly this is a dialectical relationship. Hegel has outlined that the
Marx said that one must avoid postulating society again as an abstraction vis-à-vis the individual as, for example, today's individual/society dualism does.
Saying that man is creator and created result of society, as well as Giddens’ formulation that in and through their activities agents reproduce the conditions that make these activities possible, corresponds to Marx’s formulation that “the social character is the general character of the whole movement: just as society itself produces man as man, so is society produced by him” (ibid.: 537).

**HUMAN HISTORY AND SELF-ORGANIZATION**

I want to argue that the principle of order through fluctuation can also be found in society, but that this does not deprive human beings of agency and intervention into social systems (see also Fuchs, 2002a, 2002c). Social systems are self-reproducing by processes of synchronous emergence; from time to time they enter phases of crisis that have a nondetermined outcome and where diachronic emergence takes place. Due to the antagonistic structure of modern society that Giddens also tries to grasp in structuration theory (see Giddens, 1981: 230-9) and the complex interplay of human actions, it is not determined when such phases of crisis emerge, what the exact causes and triggers will be, and what will result from them, it is only determined that crises will show up again and again. Phases of instability are not separate from human actions, but result from their complex interplay. Social evolution is not determined by fortune and chance; human beings can consciously design evolution.

This means that the objective conditions of social existence condition a field of possibilities (see for this concept Hörz, 1974) that consists of several possible alternative ways of development that a system can take in a phase of crisis. Human beings cannot fully steer which alternative will be chosen, but by agency and human intervention they can try to increase the possibility that a desirable alternative will be taken and decrease the possibility of less desirable ones. Human history is guided by dialectical relationships of chance and necessity as well as of subjectivity and objectivity. Reducing these complex, dialectical relationships to one side will result in reductionistic conceptions that see social change as fully determined either by chance or by conscious steering.

The overall self-reproduction of society is not a smooth, permanently stable process, it is in constant flux and from time to time enters phases of crisis. These are periods of instability where the further development of the overall system is not determined.

In modern, capitalist society, periods of crisis are caused by structural economic, political, and cultural antagonisms. Social complexity results from the numerous social relationships that individuals enter and that change historically. Due to the complexity of society, capitalist crises have economic, political, and cultural aspects and are not caused by one universal antagonism. Due to the material base of society, economic antagonisms play an important and dominating role, but they do not fully determine the occurrence and outcome of crises.

Capitalism is itself a sequence of different phases; that is, the structure of capitalism changes on a certain level and new qualities emerge. It is determined that the evolution of capitalism will sooner or later result in a large societal crisis, but it is not fully determined which antagonisms will cause the crisis and what the result of the crisis will look like. Concerning a point of bifurcation in society, the historical development is relatively open; it depends on subjective factors, that is on agency and human intervention that can increase the possibility that certain paths will be taken and others will be avoided. However, there can be no certainty; the sciences and hence also the social sciences are confronted with the end of certainties (Wallerstein, 1997).

The dialectic of chance and necessity that shapes society is a very general evolutionary law because it describes social change as taking place in discontinuous ruptures called points of bifurcation where human agency plays an important role and the outcome is relatively open. The modern world is shaped by antagonistic structures; human agency takes place within and through these contradictions. So what I call necessity, the fact that capitalism enters crisis again and again, is also a result of human action and the duality of the antagonistic structures of the modern world. Self-organization theory shows that humans make their own history, but that history and human possibilities are conditioned. Such a concept of evolution acknowledges the importance of agency in social change and refutes notions such as adaptation and homeostasis that describe the development of systems in terms of stability and equilibrium.

The term evolution should not be refuted; it can be used in nondeterministic ways that include the concept of the duality of structure. Giddens stresses that modern history develops discontinuously, this assumption is very much in line with the notion of social change by order through fluctuation in points of bifurcation marking discontinuous breaks in the development of society. However, I would like to add that the evolutionary principle that includes the dialectic of chance and necessity and order through fluctuation is in fact a continuous principle in history, and that therefore there are in fact a few universal laws in society. Assuming this does not automatically imply that human agency is unimportant for social change; in fact this general principle only operates within and through the principle of the duality of structure.

In structuration theory, episodes are processes of social change that have a definite direction and form and in which structural transformations occur, and of time-space edges as forms of contact between different types of society that are edges of potential or actual social transformation (Giddens, 1981: 23, 82f; Giddens, 1984: 244-56). The structural transformations...
Emergence: Complexity and Organization

the structuration of events in time and space through the continual interplay of agency and structure: the interconnection of the mundane nature of day-to-day life with institutional forms stretching over immense spans of time and space. (Giddens, 1984: 362f)

Conjunctures understood as interaction of influences that, in a particular time and place, have relevance to a given episode play an important role in social change (Giddens, 1984: 251). Similar results can have quite different causes. As a result, there are no universal laws in society independent from time-space; all such laws are historical ones and history is open to human self-transformation (Giddens, 1981: 167).

What Giddens calls conjuncture refers to the fact that similar results of social development can have quite different causes. With this concept he tries to avoid determinism in the social sciences. It very much resembles the assumption of self-organization theory that causes and effects cannot be mapped linearly: Similar causes can have different effects and different causes similar effects; small changes of causes can have large effects whereas large changes can also only result in small effects (nonetheless, it can also be the case that small causes have small effects and large causes large effects). Self-organization theory, just like structuration theory, questions mechanistic causality.

Giddens argues that evolutionary theories frequently see change as being caused fully endogenously without external influences. In the social sciences, using the terms endogenous and exogenous ultimately brings up the question of the borders of the system to which one is referring. Arguing for example that economic changes are fully endogenous excludes the fact that, as the French school of regulation has shown, political regulation and ideological influences have important effects on economic development. Arguing that a nation-state develops autonomously from external influences ignores the fact that the modern world is a global, networked one where nation-states are heavily influenced by global processes. Only at the level of the world social system can causality be described as to a large extent endogenous.

When I speak of the self-organization of modern society in terms of the principle of order through fluctuation, I am referring to the global level of society that has been introduced by Wallerstein’s World System Theory. The concept of recreation not only refers to world society, but to social systems of all types and scopes. The process of self-reproduction of such a social system does not stick fully to endogenous processes; the dynamic development takes place in time and space due to influences from within as well as from without the system. Which influences act more strongly depends on the level of closure. This level itself is determined by the social relationships between the system’s members and between these people and others (outside of the system). So in fact agency is the decisive factor in deciding to which extent the selfreproduction of a social system is shaped by internal and external factors. Giddens also acknowledges this fact by suggesting that endogenous and exogenous influences shape social change (Giddens, 1981: 166f).

The process of history is one that results from an interlocking of synchronous and diachronic emergence. Synchronous emergence that is part of the recreation of society is not a smooth, stable process: There are phases of stability that are interrupted by phases of strong instability where history is relatively open and greatly depends on human action and intervention. In such a point of bifurcation—which has also been described as a “nodal line” by Hegel and Engels (see Fuchs, 2002f)—the development is not determined; a new level, that is a new type of social system, can emerge, but it is not predetermined what it will look like. This is the process of diachronic emergence that results in a temporarily stable mode of recreation where synchronous emergence takes place permanently.

INFORMATION AND SELF-ORGANIZATION

Because of the existence of different levels of complexity in different types of systems, there can be no simple general definition of information that is applicable to all forms of systems. A dialectical concept of information would have aspects that apply to all types of systems and in all scientific disciplines. However, at the same time information would have a meaning peculiar to any of these types of systems and any of the sciences.

This would be a unified concept of information reflecting the dialectic relationship of difference and similarity, and could be the essence of a unified theory of information (UTI; see Hofkirchner, 1999; Fuchs & Hofkirchner, 2002). By merging semiotics and a theory of evolutionary systems (the latter being a synthesis of second-order cybernetics and concepts of evolution as well as touching the relationship of information and emergence), a UTI seems feasible. A UTI could make use of the interdisciplinary character of the theory of self-organization.
A sign can be seen as the product of an information process. An information process occurs whenever a system organizes itself; that is, whenever a novel system or qualitative novelty emerges in the structure, state, or behavior of a given system. In such a case information is produced. It is embodied in the system and may then be called a sign. Information is a fundamental aspect of all self-organizing systems.

Elsewhere, I have argued that the recreation of society involves the bottom-up emergence of social information and the top-down emergence of individual information (Fuchs, 2002e; Fuchs et al., 2002). In social systems individual values, norms, conclusions, rules, opinions, ideas, and beliefs can be seen as individual information. Individual information does not have a static character, it changes dynamically. Recreative, that is social, systems reproduce themselves by creating social information. I consider the scientific-technological infrastructure (part of the technosphere), the system of life-support elements (part of the eco-sphere) in the natural environment, and all that in addition makes sense in a society—that is, economic resources, political decisions, and the body of cultural norms and values, laws, and rules (part of the sociosphere)—as social information.

Social information stores information about past social actions and simplifies future social situations, because by referring to social information the fundamentals of acting socially do not have to be formed in each such situation by human agents. Social information can be seen as a durable foundation of social actions that nonetheless changes dynamically. In the recreation process of society, the duality of structure based on human agency results in the bottom-up emergence of social information and the top-down emergence of individual information. Speaking of information as emergent properties in a social system means that social structures are interpreted as information structures. Synchronous and diachronic emergence are processes of information production. Each time a system organizes itself, information is produced. Individual and social information forms a basic aspect of social relationships and only exists within and through social activity. It does not have an existence external to society.

Giddens' theory of structuration also suggests such a usage of the term information in the social sciences (Giddens, 1981: 35, 39, 94f, 144, 157-81; Giddens, 1984: 180-85; Giddens, 1985: 13f, 172-97). He argues that there are storage capacities in society enabling the existence of institutional forms that persist across generations and shape past experiences dating back well beyond the life of any particular individual. Allocative and authoritative resources can be stored across time-space distances. Storage of authoritative resources involves the retention and control of information. In nonliterate societies the only "containers" storing information were human memory, tradition, and myths. Writing and notation have allowed a certain time-space distanciation of social relationships. Other forms of storing information that have followed and have caused further time-space distanciation are cities, lists, timetables, money, money capital, nation-states, communication and transportation technologies in general, and especially the rapid-transit transportation and electronic communication technologies (including electromagnetic telegraph, telephone, and computer-mediated communication).

Locales are power containers because they permit a concentration of allocative and authoritative resources. The development of cities, Giddens argues, was an indispensable locus of the transformation relations involved in the differentiation of class-divided societies from tribal societies. The city permits time-space distanciation beyond that characteristic of tribal societies. The latter were high-presence societies, which means a fusion of social and system integration. Traditions and kinship relationships were the basic storage mechanisms of social information. Traditions and kinship still play a role as integrating mechanisms in class-divided societies, but the city plays a more important role and there is an initial differentiation of social and system integration due to the differentiation of city and countryside. With the rise of modern, capitalist society, Giddens argues, the nation-state and surveillance have become the fundamental mechanisms of integration.

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Surveillance as the mobilising of administrative power—through the storage and control of information—is the primary means of the concentration of authoritative resources involved in the formation of the nation-state. (Giddens, 1985: 181)

With capitalism, a global world system emerges. The modern state would make use of surveillance in the sense of gathering information about the subject population in order to allow overall organization and control. Information gathering would include data on births, marriages, deaths, demographic and fiscal statistics, "moral statistics" (relating to suicide, divorce, delinquency, and so on) and would result in the power of the state and bureaucratic organization. Computer technology would expand surveillance in the sense of information control. Modern technology would also allow technical control and supervision of workers in a much more anonymous form than the face-to-face supervision that was used in the early days of capitalism. The rise of the modern nation-state would also mean the monopolization of the means of violence in the hands of the state, along with the extrusion of control of violent sanctions from the dominating classes. Employers do not possess direct access to the means of violence; "dull economic compulsion" (Marx) and the concentration of labor within the workplace replace the direct coercive control of the workforce.
In capitalist societies, administrative organizations such as business firms, schools, universities, hospitals, and prisons would be centers for the concentration of resources and the nation-state would be the most important power container allowing a massive concentration and control of resources. Aspects that have been involved in the consolidation of the administrative unity of the nation-state would include the mechanization of transportation, the severance of communication from transportation by the invention of electronic media, and the expansion of the documentary activities of the state. With electronic modes of storage, the second and third aspects would have increasingly merged.

Social structures are an incorporation and objectification of human activities and labor. Giddens’ theory of structuration shows that social structures can be stored with the help of certain mechanisms that allow time-space distanciation of social relationships. Based on the duality of structure, the recreation of society generates and differentiates individual and social information, which can be stored and controlled across time and space by making use of certain technologies. During the history of humanity these storage capacities and mechanisms have been improved and have allowed an increase of time-space distanciation. During the last few decades, information storage and usage have become major factors in all aspects of modern life. Information and information technologies are not only major economic factors, they have also gained massive importance in political life, science, culture, administration, art, education, health, and media. Therefore we can also speak of the dominant mode of reproduction and recreation of the modern world as the informational mode of capitalist development.

CONCLUSION

I have tried to show that incorporating basic conceptual aspects of the theory of structuration into a theory of social self-organization can help in avoiding dualistic, deterministic, and reductionistic errors. The selfreproduction of social systems that has been described as a process of recreation is based on a dialectic of actors and structures that Giddens grasps with the notion of the duality of structure. Avoiding functionalistic and deterministic shortcomings must not include refuting the notion of evolution.

It is possible to employ this concept in such a way that it refers to social change due to the emergence of order through fluctuation in situations of instability and bifurcation. Such a concept of fundamental social change does not exclude human actors as subjects of history, it is based on the notion of the duality of structure that can also be described as a dialectic of chance and necessity. All self-organizing systems are information-generating systems. Giddens’ concept of storage mechanisms that allow time-space distanciation of social relationships helps to describe the relationship of information and self-organization in social systems.

Social self-organization means information production and involves synchronous and diachronic emergence. The concept of the duality of structure from structuration theory can be described as a selforganization process of recreation. In this permanent self-reproduction of a social system we find a synchronous type of emergence; individual and social information emerge permanently in an interconnected interplay of structures and actors. This is a dynamic process that from time to time results in crises. Crisis is a fundamental mode of social change; society is in permanent flux and change. In such a phase of instability, there is a diachronic type of emergence and a new level of social organization emerges.

Structuration theory importantly points out that history is a discontinuous process. Integrating aspects from structuration theory into a theory of social self-organization can be helpful in determining the role of human, knowledgeable actors in the self-organization process of society, and in showing that society is not a static, clumsy entity, but a process structure where we find permanent flux, emergence, and phase transitions from stability to instability and back to stability.

NOTES

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Pierre Bourdieu has developed a theory of society that is in some respects very similar to Giddens' and can also be related to a theory of social self-organization (Fuchs, 2002b). His declared aim has also been to bridge the chasm between subjectivity/objectivity, society/individual, structures/action, and consciousness/unconsciousness. In doing so, he has introduced the dialectical concept of the habitus that mediates between objective structures and subjective, practical aspects of existence. The habitus secures conditioned and conditional freedom; it is a structured and structuring structure that mediates the dialectical relationship of the individual and society. For Bourdieu, in the social world we find dialectical relationships of objective structures and cognitive/motivational structures, of objectification and embodiment, of incorporation of externalities and externalization of internalities, of diversity and homogeneity, of society and the individual, and of chance and necessity. The habitus is medium and result of the social world; social structures only give orientation and limits to habitus's operations of invention, they enable and constrain the creative dimension of the habitus. Bourdieu's suggestion that the habitus is a property "for which and through which there is a social world" (Bourdieu, 1990: 140) means that habitus is medium and outcome of the social world and that social structures can only exist in and through practices. Such formulations very much remind us of Giddens' main hypothesis that "the structural properties of social systems are both the medium and the outcome of the practices that constitute those systems" (Giddens, 1979: 69). Although Bourdieu’s theory might be considered a more “structuralistic” conception than Giddens', the similarities concerning aims and certain theoretical contents are very striking. Working out the exact similarities and differences between both approaches and how a synthesis could be achieved within the framework of a theory of social self-organization is a challenging task for the future.

2. *Reason and Revolution* was published in 1941, when Marcuse had already fled to the US. His first Hegel study "Hegel’s Ontologie und Die Theorie der Geschichtlichkeit" (Hegel’s ontology and theory of historicity) should have been his thesis, but in 1933 he had to flee from Germany due to his Jewish origins and political background. The use of the term historicity in the title already shows that this first study was heavily influenced by the thinking of Martin Heidegger. The second Hegel study does not contain any reference to Heidegger because Marcuse turned away from that influence in the early 1930s and was deeply disappointed by Heidegger’s active participation in national-socialism. *Reason and Revolution* was the first Hegel study of its kind published in the US and introduced Hegel’s thinking to many American scientists.

3. Giddens defines contradiction as “the existence of two structural principles within a societal system, whereby each depends upon the other but at the same time negates it” (Giddens, 1981: 231) and argues in line with Marx that modern society is a contradictory one. He says that there is a fundamental existential contradiction in all types of society and that capitalistic structures are based on a contradiction between private appropriation and socialized production. As I have tried to show elsewhere (Fuchs, 2002a, 2002c), capitalism is not merely based on one general contradiction, but on several general antagonisms; the antagonistic structure of a mode of capitalist development such as Fordism or post-Fordism is a concrete expression of several of these general economic, political, and cultural antagonisms. When speaking of contradictions, one should also acknowledge that in dialectical thinking there is a difference between a contradiction and an antagonism: Contradictions between dual categories are forms of movements of matter, life, and society that drive the development of systems. Such categories are on the one hand opposed to each other, but on the other hand they also require each other and push forward toward sublation in the threefold Hegelian sense of preserving, eliminating, and lifting up. Contradictions are constitutive of the movement of all systems, whereas an antagonism is a dialectical relationship of colliding forces that cannot be sublated in a simple way. An antagonism “emanates from the individuals' social conditions of existence” (Marx, 1858/59: 9). The sublation of antagonisms is only made possible by a substantial change of the foundational structures of the system that embeds them and that is constituted by them. The principle of contradiction is a continuous one, that of antagonism a transitory one.

4. In structuration theory, due to human knowledgability there are no dominant continuities over human history as a whole, it is based on a discontinuist interpretation of modern history: “According to this perspective, the emergence of modern capitalism does not represent the high point (thus far) of a progressive scheme of social development, but rather the coming of a type of society radically distinct from all prior forms of social order … [In western capitalism] there has occurred a series of changes of extraordinary magnitude when compared with any other phases of human history” (Giddens, 1985: 31ff). Although Giddens does not admit it, the Marxist interpretation of history is also a discontinuist interpretation of history with class struggles as the decisive element.

5. “The conjuncture of circumstances in which one process of development occurs may be quite different from that of another, even if their ‘outcomes’ … are similar” (Giddens 1984: 251).

6. Of course, human society is not a closed system because the Earth is part of the universe and on the astronomic level there are metabolisms of energy and matter that enable life on earth.

7. By surveillance Giddens refers to the accumulation of information defined as symbolic materials that can be stored by