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<111> Chapter 6

Autopoiesis and Critical Social Systems Theory

Christian Fuchs and Wolfgang Hofkirchner

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1 Introduction

Maturana and Varela (1980, p. 78f) provided the following definition of autopoiesis: “An autopoietic machine is a machine organized (defined as a unity) as a network of processes of production (transformation and destruction) of components that produces the components which: (i) through their interactions and transformations continuously regenerate and realize the network of processes (relations) that produced them and (ii) constitute it (the machine) as a concrete unity in the space in which they (the components) exist by specifying the topological domain of its realization as such a network.” This definition shows that for Maturana and Varela, autopoietic systems are systems that define, maintain, and reproduce themselves. The notion of machine that they employ in the definition might seem a bit misleading because we tend to think of machines as mechanistic and nonliving, but Maturana and Varela (e.g., 1987) in later publications have preferred to speak of autopoietic organizations.

Social systems are systems that are based on the interactions of living systems. Maturana considers them as higher-order systems. The question therefore arises if these systems are also autopoietic systems. The paper at hand will discuss this question and try to give an answer that is critical of the one given by the main representative of the theory of social autopoiesis — Niklas Luhmann.

According to Niklas Luhmann, the first and still most prominent thinker on social autopoiesis, organizations are a variety of social systems besides interaction systems and societal systems. As there has been much discussion on the question whether social systems in general can be said to be autopoietic and if so to what extent, we resume this discussion.

The rise of the importance of the sciences of complexity can be interpreted as a turn toward the conception of reality as complex, dynamic, and networked. In biology, Maturana and Varela (1987) have been two of the most important <112> scholars who are well known for the application of

complexity thinking to living systems. They argue that the *differentia specifica* of living systems is that they can maintain and reproduce themselves by dynamically producing their own components and with them a systemic unity. Conceiving a system as autopoietic means to stress that it is dynamic and self-creating. The question arises if it is possible to generalize this concept and to apply it to social systems and what advantages or disadvantages such an endeavor brings. In this paper, we discuss two basic possibilities for considering social systems as self-producing systems.

First, we discuss Niklas Luhmann's approach of self-referential systems, which can be considered as the most important approach of autopoietic social theory. Second, based on a critique of Luhmann, we introduce an alternative approach that we term critical social systems theory.

2 Niklas Luhmann's Theory of Social Systems

Maturana has defined a social system as "a collection of interacting living systems that, in the realization of their autopoiesis through the actual operation of their properties as autopoietic unities, constitute a system that as a network of interactions and relations operates with respect to them as a medium in which they realize their autopoiesis while integrating it, is indistinguishable from a natural social system and is, in fact, one such system" (Maturana, 1980, p. 11; Maturana, 1987, p. 292). The focus is on individuals, interactions, and networks. However, Maturana argues that social systems are conservative, non-autopoietic systems.¹ This assessment could reflect the difficulty in arguing what the autopoietic unity that is permanently reproduced is in the case of social systems. Human individuals are not permanently created because their creation is a singular biological process that starts life.

Niklas Luhmann has attempted to interpret social systems as self-producing by taking a nonhuman-centered approach.

Luhmann (1984) conceives society in rather functional terms, wants to apply Maturana's and Varela's autopoiesis concept sociologically, and sees social systems as self-referential systems with communications as its elements. He 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 socially. This means that for Luhmann biological reproduction by sexual intercourse is the reproduction mechanism of humans, but not the reproduction mechanism of social systems. He infers from this argument that humans are not part of social systems and that human actors cannot be the components of social systems. If one wants to consider a social system as autopoietic or self-referential, the permanent <113>

¹ <http://www.inteco.cl/biology/ask9707-1.htm>

(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; 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 communication which are recursively produced and reproduced by a network of communications and which cannot exist outside such a network" (Luhmann, 1988, p. 174). For Luhmann, human beings are sensors in the environment of the system. He says that the "old European humanistic tradition" conceives humans 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. Luhmann stresses communicative processes instead of human beings. The "revolution" in social science that he wanted to bring about is one that conceptually excludes human actors from society.

Luhmann resolves the sociological problem of how social structures and human actors are related dualistically, which results in inconsistencies and theoretical lacks. According to some critics of Luhmann, he fails to 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, p. 149f). An autopoietic conception of society must show consistently how society produces its elements and thereby reproduces itself. Beyerle (1994, 137f) criticizes that Luhmann does not show how communications are produced. Luhmann only mentions that communications *result* in further communications. He can explain that society is self-referential in the sense that one communication is linked to other ones, but he can't explain that it is self-producing or autopoietic.

In Luhmann's theory, not humans but only social systems act; he describes systems in human terms and neglects human agency. There is one characterization and critique that Giddens (1984) gives of functionalism that also holds for Luhmann's social systems theory: functionalism is unable to see human beings as reasoning, knowledgeable agents that with practical consciousness that are at the center of social reproduction and argues that society and institutions have needs and fulfill certain functions. Luhmann considers humans as being outside observers of social systems and he assigns certain functions to subsystems of a functionally differentiated society. Functionalism according to Giddens (1984) sometimes results in views of a subjectless history that is driven by forces outside the actors' existence that they are wholly unaware of. Reading Luhmann, one gets the impression that systems are for him such outside forces. That Luhmann does not see humans as part of social systems is indicative of this. Luhmann's thinking dichotomizes the social and the individual by

paying almost no attention to individual social action that draws on or is shaped by social structure and, in turn, reproduces such a structure.

<114> The consequence of Luhmann's exclusion of humans and their interests from his theory is a blindness for social problems that created an affirmative uncritical theory that describes society as it is, not also as it could be. Luhmann (1984) explicitly argues that his theory is not a social problems approach. So Luhmann (1996a), e.g., claims that the mass media can't manipulate humans because they, just like every system, would construct a legitimate reality. The function of the mass media for him is that they provide topics for communication and hence advance the autopoiesis of society. There is no analysis of simplification, scandalization, and emotionalization as media tactics, one-dimensional reporting, staged media events, the role of the Internet in the mass media, media monopolies, and so on. For Luhmann, there are no problematic aspects of the mass media — and of contemporary society at a whole.

The dramatic implications of Luhmann's theory become most apparent in his discussion of protest movements. He argues that social movements are alternatives without alternatives (Luhmann 1996b, p. 75ff.), that they protest against the functional differentiation of society (p. 76), operate within society against society (p. 103, 204), have no alternatives to offer (p. 104), fetishize opposition and alternative thinking (p. 159), are made up by a notoriously mentally unstable public (p. 204), stage provocation as end in itself (p. 206), possess no analytical depth and don't know why something is as it is (p. 207), stage protest as pseudoevents (p. 212), are a form of refractory communication against communication (p. 214), constitute a disturbing aspect of modern society (Luhmann 1984, p. 545), and act as negators that weaken the affirmation of society (ibid., p. 549ff.).

For Luhmann, protest movements are reactive, aimlessly, and dangerous. Each protest movement has values and certain political goals; hence, it wants to change society. Social movements are not reactive but active and proactive. Luhmann's characterization aims at discrediting protest; if the latter is not seen as a positive function of society, alternatives are considered as undesirable. A society that forestalls critique seems close to a totalitarian society; a theory that considers critique and opposition as undesirable is affirmative and seems accordingly close to a totalitarian theory. The role of sociology in society is critique and reflection of society; a pure description of society as it is as the best form of society is uncritical and affirmative. For Luhmann, the function of protest movements is that they convert the negation of society in society into operations (ibid., p. 214). According to Hegel, a contradiction can be interpreted as not purely negative but a determinate negation, i.e., a contradiction results in the negation of the negation; it is sublated and produces positive results. Protest movements then can be considered as a negation of existing structures and values, but they strive for changing society, i.e., for a negation of the negation and for sublation. They are movements because they move society and want to guarantee dynamic change.

Based on a dualistic concept of system and environment, Luhmann can neither explain how ecological problems are caused nor how they could be solved; he is only interested in how society communicates about ecological problems (ecological communication) and argues that ecological problems are only problems because society communicates them as problems (Luhmann, 2004, p. 63), which suggests a radical constructivist perspective that doubts the existence of real problems. In such an approach, ecological problems are not real but only constructed.

The Habermas/Luhmann debate has shown that there is a difference between critical thinking and the thinking of Luhmann (Habermas & Luhmann, 1971). Habermas's <115> main criticism of Luhmann is that the latter considers society as instrumental and describes it as it is and not as it could be. Luhmann is only interested in describing society, whereas Habermas argues that ignoring social problems and aspects of how to improve society and how to advance human interests and human emancipation means to reduce sociology to the logic of instrumental and functional reason. Habermas says that Luhmann ignores the intersubjective and democratic dimensions of social relationships, i.e., that consensus and participation can be achieved by communicative action in ideal speech situations that satisfy the four validity claims of truth, truthfulness, rightness, and comprehensibility. Luhmann argues that modern society is too complex for allowing discursive decision taking. It is no wonder that based on a system/human dualism, he is blind for social problems and human interests. Luhmann (1984, p. 114) argues in this context that he does not pursue a social problems approach. We agree with Habermas's criticism in this respect. Luhmann constituted a methodological antihumanism, whereas critical theories have always been forms of methodological humanism. Critical theory is about analyzing how to change society, for Luhmann social theory is about describing society. This is a crucial difference. We stick to Horkheimer's view that theory should not have an interest in "the preservation of contemporary society but in its transformation into the right kind of society" (Horkheimer, 1937/2002, p. 218). Such theories try to show conditions and hindrances for the emergence of a "society without injustice" (221) that is shaped by "reasonableness, and striving for peace, freedom, and happiness" (222), "in which man's actions no longer flow from a mechanism but from his own decision" (229), and that is "a state of affairs in which there will be no exploitation or oppression" (241).

An alternative view of how autopoiesis can be applied to social systems is the critical social systems theory approach.

3 Critical Social Systems Theory

A critical social systems theory is a critical theory of social systems. It combines the stance of critical theory as represented by, e.g., Habermas and Herbert Marcuse and the Frankfurt School philosophers like Ernst Bloch — a theory which has its roots in the *weltanschauung* of Karl Marx — and a system theoretical view, in particular, science of complexity insights provided by Evolutionary

Systems Theory (EST) applied to the domain of social systems and going back to General System Theory (GST) as inaugurated by Ludwig von Bertalanffy among others.

We present this approach by discussing three aspects of critical social systems: design, modeling, and methodology one by one.

3.1 Critical Social Systems Design: The Importance of Being Critical

Design is concerned with the relation of theory and technology, theory and practice. It's the context of application, in which scientific knowledge is used for solving problems and is transformed into technologies, whether material or ideational. It addresses the opposition of normative versus descriptive.

<116> This question had been contested with considerable amount of attention in the second half of the last century. Positivism tried to exclude this context by terming it a factor external to science. Nowadays, in social science there seems to be a consensus on rejecting the ideology of value-free science.

Not so with Luhmann. Luhmann's theory is nonnormative, i.e., it avoids to discuss and criticize societal problems. By doing so, however, it becomes affirmative because just describing society as it is means to leave it unquestioned and give dominant groups the opportunity to positively refer to this theory in their endeavor to uphold asymmetric power relations.

Critical thinking is not entirely new to systems theory. If we equate the beginnings of systems science with Ludwig von Bertalanffy's GST, then systems science has been normative from its very beginning. Bertalanffy's GST is a humanistic one. Thus all his descriptions of humans and social systems serve the function to help to formulate guidelines for acting toward humane norms and values (see Hofkirchner, 2005).

Approaches like Critical Systems Thinking (CST) have been grounded in Habermas' version of critical theory. Two of the five commitments of CST are critical awareness and dedication to human emancipation (Jackson, 1991). CST rests "upon Habermas' theory of human interests as mediated through the system of system methodologies" (Jackson, 1991, p. 83). CST is "dedicated to human emancipation and seeks to achieve for all individuals the maximum development of their potential" (ibid., p. 85). It especially tries to advance the emancipatory interest (which is one fundamental human interest besides the technical and the practical interest) of humans by "denouncing situations where the exercise of power, or other causes of distorted communication, are preventing the open and free discussion necessary for the success of interaction" (ibid., p. 85).

CST sees itself in the service of a more general emancipatory project (ibid., p. 86). "Critical systems thinking, and the thrust of Total Systems Intervention (TSI) therefore, is emancipatory in

that it seeks to achieve for all individuals, working through organizations and in society, the maximum of their potential. (...) The exercise of power in the social process can prevent the open and free discussion necessary for the success of interaction. Human beings have, therefore, an ‘emancipatory’ interest in freeing themselves from constraints imposed by power relations and in learning, through a process of genuine participatory democracy, involving discursive will formation, to control their own destiny” (Flood & Jackson, 1991, p. 95f).

Critical social systems thinking can easily be based upon EST — a term by which a theory of complex, dynamic, nonlinear, open, self-organizing systems is denoted. Evolutionary systems design principles encourage to make use of the systems’ dynamic and stress the point that knowing about nonlinearity and sensitivity may help to choose those inputs that trigger developments in the overall self-organization process of the system that are favorable to those who make the inputs. System processes may be facilitated or may be dampened. Also it is important to influence the general setup of the system only and abandon instructions down to every detail so that relative autonomy is granted to the subsystems. Being critical can be ascribed to this theoretical framework when applied to social systems in that it is normative while <117> doing justice to the factual at the same time. For it includes not only an account of the potential that is given with the actual, but also an evaluation of the potential which sorts out the desired.

In a philosophical perspective, this deliberate activism is not a practicium that guides action according to the maxim that all that is feasible shall be realized thereby assuming that it is desired too. Nor is this kind of activism a utopian or romantic wishful thinking that holds that what is desired is feasible too. Both practicium and wishful thinking believe in total controllability and result in expensive brute-force interventions. Nor is this kind of activism an inactivism that believes in total uncontrollability, condemns any kind of intervention and fails to reconcile the feasible and the wishful. On the contrary, it takes responsibility for producing the unity of the feasible and the wishful. And it does so by working out the ascendance from the potential given now to the actual to be established in the future as well as the ascendance from the less good now to the better then which altogether yields the Not-Yet in critical theorist Ernst Bloch’s sense (see, e.g., Bloch, 1967). These processes aimed at the Not-Yet are at the core of the dynamic of social self-organization. By the notion of the Not-Yet Bloch tried to salvage the idea of utopia — it is not any longer a nowhere deprived of the possibility to get there but a future that can be glimpsed and anticipated in what is already possible here and now.

Why is it especially important today to advance a critical approach? We consider it irresponsible if social theory is watching as a bystander as the world is increasingly getting out of human control. Due to the existence of global problems, we argue that a critical social systems theory is needed. There is evidence that late-modern society is characterized by culminating antagonisms between economic feasibility and social usefulness of technological products, between

economic growth and ecological sustainability, and between economic freedom (of markets) and social equity.²

<118> Critical theory doesn't accept existing social structures as they are, it is not interested in society as it is, but in what society could be and can become. It deconstructs ideologies that claim that something can't be changed and shows potential counter tendencies and alternative modes of development. That the negative antagonisms are sublated into positive results is not an automatism, but depends on the realization of practical forces of change that have a potential to rise from the inside of the systems in question in order to produce a transcendental outside that becomes a new whole. All critical approaches in one or the other respect take the standpoint of oppressed or exploited classes and make the judgment that structures of oppression and exploitation benefit certain classes at the expense of others and hence should be radically transformed by social struggles.

We understand the notion of critical theory in the sense of approaches that are oriented on maximizing human potentials and realizing societal conditions that give advantages to all humans. Such theories are human-centered; they have human needs and the goal of a good life for all as their central concern. This endeavor also includes criticizing societal conditions that limit human potentials as unjust.

If critical theory means human-centeredness as normative quality, then such a theory needs to put humans also in the center of theory itself. That global problems like global war, the ecological crisis, rising inequality, precarious labor and living conditions, etc., have emerged is an indication for the assumption that under the given societal conditions, human-centeredness is only the essence, but not the reality of society — to paraphrase Hegel. Not all humans benefit, only certain classes benefit at the expense of the large majority. Human-centeredness implies that society shall be designed in a way that allows all humans to realize a maximum of their potentials and to live a good life. As this is not the case today, human-centeredness implies the critique of contemporary society and the

² Income inequality measured as the relation of the mean income of the upper and the lower quintile has decreased in the years 1995–2000 in the EU15 countries, but it has increased from 4.5 in 2000 to 4.8 in 2005 (Eurostat Online). The higher this measure, the higher the income disparity between the poorest and the richest. In the EU25 countries, it has increased from 4.5 in 2000 to 4.9 in 2005. In 2000, the richest 5% Europeans owned 35.7% of the worldwide wealth (Davies et al., 2006, table 10a). The at-risk-of-poverty rate after social transfers measured by 60% of median equivalized income after social transfers has risen from 15% in 1998 to 16% in 2005 in the EU15 as well as the EU25 countries (Eurostat Online). Income inequality as measured by the Gini coefficient has increased from 29 in 1998 to 31 in 2005 in the EU25 countries and from 29 in 1998 to 30 in 2005 in the EU15 countries (Eurostat Online). The in-work at risk of poverty rates for part time workers was 11% in the EU25 and 10% in the EU15 countries in 2005 (Eurostat Online). The increase in income inequality, job insecurity, and poverty risk has been accompanied by a polarization between capital and labour: Whereas the average profit rate has increased by 39.4% in the years 1987–2007 in the EU15 countries (net returns on net capital stock, European Commission Annual Macro-Economic Database), the wage share has in the same time span decreased by 7.5% (Compensation per employee as percentage of GDP at current market prices, European Commission Annual Macro-Economic Database). It is hence reasonable to assume that during the last years and decades, economic growth has been accompanied by a rise of relative wage decreases, income inequalities, and poverty risks. Hence, we assume that such a form of economic growth, i.e., the unhindered expansion of capital accumulation, is not compatible with social sustainability.

normative claim for societal transformation. Contemporary capitalist society is not human-centered, but capital- and power-centered — money capital and political power have colonized human interests and caused an alienation of society from its human essence.

Our approach therefore aims at human-centeredness, but at analyzing social systems nonetheless as dynamic and self-producing. What is the basic advantage of the application of a transposed notion of autopoiesis to social systems for a critical theory? If social systems are conceived as dynamic, fundamental social change can be conceived as a potential development. This is particularly important today because neoliberal scholars and politicians tend to argue that there are no alternatives to neoliberalism (the ideology of “there is no alternative,” TINA) in particular and capitalism in general. Dynamics means that change is an inherent feature of society. If change is taking place permanently, then it is likely that fundamental change can also occur and is an option that humans can pursue. This holds not only for societal systems, but for organizations as well.

3.2 Critical Social Systems Modeling: Social Change as Autopoiesis, Autopoiesis as Self-Organization

The basic onto-epistemological question is: are models constructs that are subjective, kind of arbitrary, and can't be corroborated because of the lack of an authority that <119> would decide upon truth or untruth because this decision, in turn, would need a legitimation — and so forth *ad infinitum* — or are models made for mapping reality by which objectivity would enter the scene? The answers distinguish between a constructivist and a realist stance. Modeling is about the relation of theory to reality and by that about the relations of theories to each other. It is the context of justification in which scientific knowledge is critically exposed to possible refutations and corroborated in as far as it is not refuted and theories are comparatively assessed.

Unlike today's radical constructivism, Bertalanffy's GST supported the idea that we are dealing with real-world systems and not with mere constructs. However, there is also a constructivist part in his GST perspective, for he appreciated the fact that it is models we construct in dealing with reality and that it is models that determine how we perceive reality. He called his view “perspectivism” which is neither absolutism nor nihilism. He stated that, e.g., a fly, a dog, or a human being has only limited knowledge of the world, but that this knowledge has some validity because otherwise the fly, the dog, the human would not have been able to survive for long (see Hofkirchner, 2005).

Evolutionary systems modeling principles take as starting point that self-organization takes place in phases that yield different levels of real-world systems. Evolutionary systems undergo stages. The stage model of systems evolution is based upon the principle of emergentism and the principle of asymmetrism. Emergence takes place in transitions in which by the interaction of proto-

elements systems are produced. Asymmetry describes the suprasystem hierarchies in which subsystems are encapsulated.

The ontological perspective of EST — a term coined by Ervin Laszlo (1987), Vilmos [8]Csanyi (1989), and Susantha Goonatilake (1991) — as a theory about evolving systems is the result of the merger of systems theory and evolutionary theory which nowadays not only applies to living and human/social systems but also to physical systems, i.e., to the cosmos itself.

EST aims at distinguishing between different levels of self-organization, i.e., self-organization has aspects that are common to all types of systems as well as aspects that are unique to a concrete type of system. There are systems and processes that manifest patterns. Pattern is form, i.e., a superstructure that refers to a basis that refers to the superstructure, and so on. These are macro- and micro-levels that coexist and influence each other which is more important than the influence from outside. The system is produced by its elements, and the system constrains and enables its elements at the same time. As this works by dissipation of entropy, Ilya Prigogine (1980) called the emerging structures “dissipative.” The fluid particle in the Bénard convection cell — i.e., a hexagonal pattern emerging from conduction in liquids of high viscosity if exposed to a temperature gradient that exceeds a certain critical value — is prompted to contribute to the cell structure that emerges from the activities of all particles. This is said to be true of all self-organizing systems on a physical and chemical level.

Then there are systems and processes that are able to maintain the form they show, i.e., to hold the form stable while matter is changing. This is the case with all living systems. This is why Maturana and Varela (1980) called them “autopoietic.” <120> By stressing the fact that in living systems the elements that constitute the system produce new elements by which the system can be constituted, Maturana and Varela denoted that living systems are systems that produce themselves by constraining and enabling their elements to produce new elements that produce the systems. Put it that way, it becomes clear that EST can consider autopoiesis, i.e., living self-organization, as evolutionary follow-up of dissipative self-organization in physical and chemical systems and as physical and chemical basis for biotic self-organization processes. Autopoiesis can be looked upon as a particular way of universal self-organization, characteristic of living systems.

The same figure of thinking evolutionary systemically is applied by EST when it comes to the human/social level. Human/social system and processes are viewed as systems and processes that change their form in a rather deliberative way, i.e., they are endowed with the capability to transcend themselves, invent themselves. This is what Erich [30]Jantsch (1987) was pointing at when talking of “re-creative” systems at the human/social level.

Re-creation means that social systems do not only have the capacity to modify themselves (as physical and chemical self-organizing systems do) and to essentially maintain themselves (as living self-organizing systems do), but they also have the capacity to reinvent themselves, to shape

themselves, to produce a specific character by which the individuals that are parts of a social system can strive to realize themselves in a more or less self-determined way. That is to say, systems at the evolutionary stage of human society are just another — but new — way of metabolism nonhuman living systems carry out (just as systems at the evolutionary stage of living beings are another way of making use of energy than nonliving material systems do): re-creation is a particular way of autopoiesis which is a particular way of dissipative self-organization.

In this vein, there is no problem to include human beings in social systems, but it is a requisite to do this. Though humans are “produced” by humans in a biological sense, they are also produced as social beings, as members of social systems, by the actions they carry out under the constraints and enablers social systems represents to them. So autopoiesis is clearly there, and it is amended in so far as transformations of social systems can occur.

Applying EST models to social systems means to give an answer to how to relate individuals and society — the central theme each general sociological theory revolves around and which is known today as the duality of agency and structure (see Reckwitz, 1997). Given this basic duality, there are four ways of conceiving of their relationship. The first way is individualism which can be classified as downward reductionism because it gives priority to individual phenomena over societal ones as action theory does. The second way is a kind of reverse reductionisms which better may be called downward projectivism typical of structuralism that reverses the priority relationship, which means that properties of the higher, the macro-, level (society) are projected onto, or extrapolated to, properties of the lower, the micro-, level (individuals and their actions). The third way is a dualistic view that takes for granted the independent existence of structures and agency and cuts <121> individuals free from societal structures which is the way Luhmann chose (see Hofkirchner, 2006).

The approach of critical social systems theory that we have tried to ground during the past years (cf., e.g., Hofkirchner, 1998, 2007; Fuchs & Hofkirchner, 2003, 2005; Fuchs, 2008a) is a fourth way to conceive of this relationship and starts from the human-centered argument that human beings as such are creative social beings that cocreate social reality together with others. Society is conceived as a large-scale system of networked social systems that is based on the dialectic of social structures and human actors. By social actions, social structures are constituted and differentiated. The structure of a social system is made up by the total of regularized social behavior and relations that are continuously reproduced over certain time spans. 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 system. So this quality is irreducible and it is also to a certain extent unpredictable, i.e., time, form, and result of the process of emergence cannot be fully forecast 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 re-creation because by permanent processes of agency and constraining/enabling, a social system can not only maintain and reproduce itself but also transform itself, i.e., create itself anew (see Figure 1, Hofkirchner, 1998, cf. also Fuchs, 2008a). It again and again 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). We term social systems due to their dependence on human creativity and self-producing re-creative systems.

This approach is dialectical because it conceives social systems as an interconnection of human actors and social structures. Actors and structures on the one hand are different, on the other hand actors form and are part of certain social structures and social structures condition and hence become part of human actions. The relationship can be conceived as being based on difference, unity, and interdependence. 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 systemic hierarchy (society plays the dominant role). Dialectics is said to apply whenever two correlates build a mutually dependent relationship between themselves as opposites in an asymmetrical way.

In Luhmann's approach, the unit of social autopoiesis is communication. In our approach, the unit of social autopoiesis (=re-creation) is human actors permanently reproducing and/or transforming social structures. Society doesn't produce and <122> reproduce humans biologically, but as social beings. What is permanently created in society is the fundamental quality of humans, their sociality. Society reproduces and produces man as a social being, and man reproduces and produces society by socially coordinating human actions. Man is creator of, and created by, society; society and humans produce each other mutually.

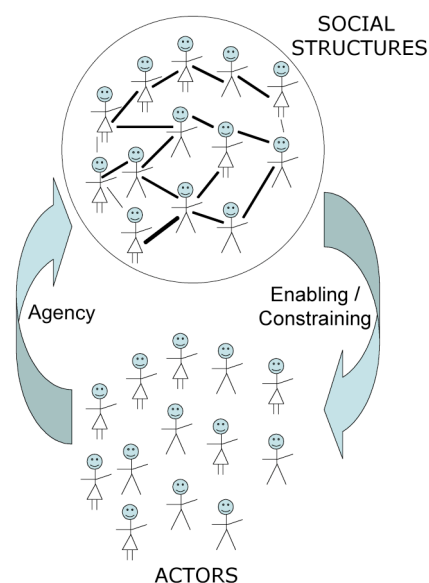


Figure 1: The dialectic of actors and social structures

In this context, Luhmann's theory of social systems seems to point to what constitutes the macro-level in our diagram (see Figure 1) only, to what is termed structure, while our approach gives a bigger picture and can be looked upon as an extension, complementation, relativation, and revision of his ideas what makes our approach a post-Luhmannian and partly anti-Luhmann one Hofkirchner, 2006; Fuchs, 2008a). This is also what John Mingers insinuates <123> when he opts for a synthesis of Luhmann's theory with a more action-oriented approach.³

The notion of the dialectics of structures and actors can be found in some important contemporary dialectical social theories. The connection to the sciences of complexity is directly acknowledged by Roy Bhaskar and Margaret Archer, who use the complexity notion of emergence. In his Transformative Model of Social Activity, Bhaskar introduces the notion of the "dialectics of structure and agency": "social structure is a necessary condition for, and medium of, intentional agency, which is in turn a necessary condition for the reproduction or transformation of social forms" (Bhaskar, 1993, p. 153).

Margaret Archer distinguishes between "people's emergent properties" (PEPs), "structural emergent properties" (SEPs), and "cultural emergent properties" (CEPs). Her approach of Social Realism is based on the "dialectical relationship between personal and social identities" (Archer, 2002, p. 18), "a synthesis such that both personal and social identities are emergent and distinct, although they contributed to one another's emergence and distinctiveness" (Archer, 2002, p. 18). Bhaskar and Archer understand society as the permanent emergence of structures based on human identity and activity.

Autopoiesis, formulated with the help of the complexity notion of emergence, means a permanent emergence of components of systems through the interactions of these components. The permanent emergence of social reality that Bhaskar and Archer describe clearly has a parallel with the notion of autopoiesis, both share the stress of dynamics and self-production. The difference is that autopoiesis has been mainly used in constructivist theories. Hence, one can read Bhaskar's and

³ Mingers' theoretical works form a very important contribution to social theory because he tries to connect aspects of social self-organization with modern sociological theories. Mingers wants to combine Luhmann's with Giddens' theory and says that society is mutually related to the interactional domain where people interact. "Society selects interactions and interactions select society — this is their form of organizational closure. We can choose to observe society, and see networks of communications triggering further communications, and forming self-bounded subsystems that persist and reproduce over time. Or, we can focus on particular episodes of interaction between individuals and groups" (Mingers, 1999, p. 38). If one observes society or a social system, one will not find either communications or interacting individuals, but both at once. Separating communications and individuals into two separate domains results in a rather dualistic and non-consistent conception. Communication and social interactions do not constitute separate domains, they are part of the structure that relates social groups and individuals, they exist in-between individuals as a connecting mechanism. To avoid shortcomings, one could conceive social structures as a unity of social relationships that take place in and through interaction and communication and social forms such as rules and resources. As long as communications are defined as components of a social system, it is a very hard or nearly impossible task to integrate the theories of Luhmann and Giddens. We prefer to define individuals as social beings and components of social systems in such a way that society produces man as a social being just like man produces society as a necessary condition for his/her social being.

Archer's approaches as a plea for a realist turn in the application of autopoiesis to society and social systems.

Pierre Bourdieu and Anthony Giddens are two other scholars who have based their theories on the dialectic of structures and agency. However, they haven't connected <124> their works to the sciences of complexity (for such an endeavor cf. Fuchs, 2003a, 2003b). Bourdieu argues that there is a "dialectical relationship between the objective structures and the cognitive and motivating structures which they produce and which tend to reproduce them, (...) these objective structures are themselves products of historical practices and are constantly reproduced and transformed by historical practices whose productive principle is itself the product of the structures which it consequently tends to reproduce" (Bourdieu, 1977, p. 83). For Bourdieu, the concept that establishes the connection between structures and agency is that of the habitus. Giddens formulates the dialectic as duality of structure: "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 organize" (Giddens, 1984, p. 25).

One aspect that these approaches have in common is that they consider themselves as dynamic critical realist theories that are not naive, but dynamic and acknowledge the importance of active humans and their social relations in society. However, not all of these approaches are critical. The approach, which most clearly can be considered as a critical theory, is Bhaskar's Dialectical Critical Realism. For Bhaskar, there is a normative feature in dialectical thinking that he terms Moral Realism. Its central feature would be absencing absence. "This encompasses the absencing of constraints, including ills generally, which comprise lack of freedoms. (...) Dialectic is the process of absencing constraints on absencing absences (ills, constraints, untruths, etc.)" (Bhaskar, 1993, p. 102, 297). Dialectic would be the axiology and pulse of freedom (Bhaskar, 1993, p. 378, 385). "Dialectic is the yearning for freedom and the transformative negation of constraints on it" (Bhaskar, 1993, p. 378). Bhaskar stresses a quality of critical thinking that is inherent in Marxian thinking: the critique of all domination because it sets limits on human potentials. "Theory is capable of gripping the masses as soon as it demonstrates *ad hominem*, and it demonstrates *ad hominem* as soon as it becomes radical. To be radical is to grasp the root of the matter. But, for man, the root is man himself. (...) The criticism of religion ends with the teaching that *man is the highest essence for man* — hence, with the *categoric imperative to overthrow all relations* in which man is a debased, enslaved, abandoned, despicable essence, relations which cannot be better described than by the cry of a Frenchman when it was planned to introduce a tax on dogs: Poor dogs! They want to treat you as human beings!" (Marx, 1844, p. 385).

Critical theory is materialistic in the sense that it addresses phenomena and problems not in terms of absolute ideas and predetermined societal development, but in terms of resource distribution and social struggles. Reality is seen in terms that address ownership, private property, resource

distribution, social struggles, power, resource control, exploitation, and domination. In such an endeavor, a reactualized notion of class is of central importance (cf. Fuchs, 2008a, Chapter 7.3). To make a materialistic analysis also means to conceive society as negativity. To identify antagonisms means to take a look at contradictory tendencies that relate to one and the same phenomenon, create societal problems and require a fundamental systemic change in order to be dissolved.

Our critical social systems modeling approach is a non-constructivist one because we find it difficult to conceive society as just a construct of the human mind <125> (as, e.g., argued by Ernst von Glasersfeld, 2008, cf. also the comment on Glasersfeld's notion of society by one of the authors of the paper at hand, Fuchs, 2008b). The regularized patterns of society that we encounter and cocreate in everyday life and that seem to enable continuous social activity are evidence that we can be confident that others exist and are potential partners of communication in an overall shared space that is termed society and that is created by many individuals together and hence is not independent of these individuals, but also not reducible to their cognition, as they require others with whom they mutually create that space. This space is objective in the sense that it is cocreated by humans who in their social relationships create supra-individual regularized patterns of interaction that they can rely on in everyday life and that makes social activity work. Society is not independent of individuals, but also not as radical constructivism seems to claim only subjectively cognitively constructed.

Therefore, our notion of self-producing social systems is realistic, it assumes that social reality exists objectively and is recognized and transformed by humans who are parts of social reality and form this reality in interaction with others. Our approach could be classified as a variety of critical realism (cf. Bhaskar, 1975, 1993, 1998).

3.3 Critical Social Systems Methodology: Unity Through Diversity

Methodology refers to the context of discovery in which scientific knowledge is conjectured and theoretical assumptions are formulated in relation to empirical findings. It concerns the approach that is taken to research the field in question. Fundamentally, it touches the issue of analysis and synthesis.

GST is synthetical, but without denying the role of analyses. In finding rules of organization and founding modern systems thinking, Bertalanffy ties up to the Aristotelian saying "The whole is more than the sum of its parts." He does justice to the old Greeks' concept of cosmos and Aristotle's holism and teleology as well as to Galilei's *metodo resolutivo*. For he argues that analysis is necessary, but nevertheless it does not suffice. "Unity-through-diversity" means in this respect the obligation of not being satisfied with the analytical method that yields detailed results of diverse parts but to long for a bigger picture by means of synthesizing these results. Actually, this is the core of systems thinking. It is this approach that makes systems thinking the outstanding method appropriate to coping with complexity.

EST takes for granted that in order to be in the position to grasp the bigger picture, it is necessary to admit that there are shortcomings in pure analysis that need to be overcome. Recognizing leaps in quality as, e.g., in system transitions and in-between system levels means acknowledging principles of formalization gaps: they hold it is impossible to find an operation in the mind that accomplishes the leap from one quality to another in an unambiguous and compelling way. Those leaps can only be bridged by synthetic thinking. After centuries of predominance of the analytical mode of thinking, the paradigm change has to go in the direction of a synthetic overall view. However, this integrative view of what can be perceived by human intelligence does not need to, indeed must not, be a return to the premodern vision of <126> the speculative natural philosophy of antiquity. Rather, it can and must assimilate the knowledge gained from research in every discipline in a historical process which rises from the abstract to the concrete.

This way of thinking was applied when Flood and Jackson (1991) dealing with the variety of approaches in the systems movement itself came up with their so-called System of Systems Methodologies, which they called “complementarism” and, after slight modification in the tradition of their CST, was, e.g., termed “discordant pluralism” (Gregory, 1996). Complementarism or discordant pluralism does not mean that anything goes. “There is a need for debate about what are “good” arguments and what are not, and for discussion about how we can choose between different positions that are conflicting” (Gregory, 1996, p. 54). Though “different perspectives and systems methodologies should be used in a complementary way to highlight and address different aspects of organizations, their issues and problems” (Jackson, 2003, p. 285), they are brought together in a constellation that does not give way to a reduction to a common denominator, but serves as the basis for a discourse that, as Gregory points out, is “not a relativistic chaos of unrelated factors, but a dialectical model” (Jay, 1984, p. 15, cited in Gregory, 1996, p. 54). The question of different perspectives is framed “in a way that recognizes the legitimacies of each position” involved. It “is a *third* perspective through which the legitimacies of each value system can be brought together in a critically systemic discourse.” This may include that “such a constellation may *legitimately* eliminate elements of otherness that have been identified as illegitimate” (Gregory, 1996, p. 55).

While the System of Systems Methodologies is confined to the tool box of systems approaches, Mingers made substantial contributions to multi-method research and a pluralist methodology in the realm of sociology and social science and information systems outside systems thinking when, in drawing upon Bhaskar, elaborating a philosophical position called “critical pluralism” (see Mingers, 2001a). He argues for detaching research methods from the paradigm they are espoused with by convention and assign them a role in concrete research tasks independent of the traditional paradigms. But, other than Mingers contends, we believe that putting them into a new context means and shall mean their integration on a meta-level system of methods.

Combining both the ideas of a System of Systems Methodologies and Critical Pluralism, i.e., extending the systematization attempt beyond systemic methods to other sociological, social

scientific, and other methods is what is needed, when it comes to critical social systems thinking in our opinion. On a meta-level, a methodology can be built that is a system of methods that, in turn, originate from different theoretical angles, but undergo a process of critical reconsideration in order to suit a common methodological umbrella. The underlying way of thinking is a dialectical account of unity and diversity or identity and difference. Ways of thinking can be seen as ways of considering how to relate identity and difference. The dialectical one — which is opposed to reductionism, projectivism, and disjunctivism — establishes identity in line with the difference; it integrates both sides of the difference (yielding unity) and it differentiates identity (yielding diversity); it is a way of thinking that is based upon integration and differentiation; it is opposed to both unification and dissociation and yields unity and diversity in one — <127> unity in diversity and diversity in unity. As French social thinker and systems philosopher Edgar Morin puts it: “It means understanding disjunctive, reductive thought by exercising thought that distinguishes and connects. It does not mean giving up knowledge of the parts for knowledge of the whole, or giving up analysis for synthesis, it means conjugating them. This is the challenge of complexity which ineluctably confronts us as our planetary era advances and evolves” (1999, p. 19).

Thus, a critical social systems methodology shall be capable of doing justice to methods other than system methods and including them as well. It is critical in that it combines different methods to consider properly the multidimensionality of the world. The concept of re-creation or social autopoiesis takes into account that phenomena don't have linear causes and effects, but are complex, dynamic, and open to the future. Systems carry certain development potentials in them that at the same time pose positive and negative potentials that are realized or suppressed by human social practice. Dialectical reasoning means acknowledging the existence of contradictions and the search for these contradictions. Dialectical analysis in this context means complex dynamic thinking, realism an analysis of real possibilities and a dialectic of pessimism and optimism. In a dialectical analysis, phenomena are analyzed in terms of the dialectics of agency and structures, discontinuity and continuity, the one and the many, potentiality and actuality, global and local, virtual and real, optimism and pessimism, essence and existence, immanence and transcendence, etc.

4. Conclusion

In this paper, we have argued for a turn in systems theory and social autopoiesis theory away from constructivism and functionalism toward critical thinking, dialectics, and human-centeredness. The predominant application of autopoiesis to social systems is Niklas Luhmann's social systems theory. We identified the exclusion of humans from social systems as the main problem of Luhmann's theory. This separation of systems and humans results in an affirmative approach that neglects social problems. Critical social systems theory sees humans at the center of social systems, it argues that humans coproduce and reproduce social structures, which condition further human

actions, by which again structures emerge and are reproduced, etc. This dynamic, dialectical process was termed re-creation. Re-creation is an autopoietic process because the unity of human actors and social structures that constitutes sociality is permanently reproduced and reemerging. The acuteness of global societal problems requires that today social theory is not just descriptive and analytical, but also normative and in the interest of oppressed groups and individuals. Therefore, we argued that human-centeredness should also be seen as an important critical feature of contemporary social theory.

Are social systems autopoietic? Yes, but we suggest an understanding that is human-centered and therefore departing from Luhmann's interpretation. We argue that humans permanently create the unity of human actors and social structures, i.e., human sociality, in society. What is permanently created in society is the <128> fundamental quality of humans, their sociality. Society reproduces and produces man as a social being, and man reproduces and produces society by socially coordinating human actions. Man is creator of, and created by, society; society and humans produce each other mutually. We try to frame social autopoiesis as a process, in which we find a dialectic of social structures and human actors. Luhmann's focus on communications and structures as unit of autopoietic reproduction is in our approach replaced by the unity of structure and actors. We have argued that this focus allows to build a critical autopoietic theory of organizations and society. The gain of a reinterpretation of autopoiesis that is connected to thinkers like Giddens, Bourdieu, or Bhaskar is a critical focus that we miss in Luhmann's theory.

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