Can inter-human communications be modeled as "autopoietic"?

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The organic system functions as an environment for consciousness; the system of consciousness functions as an environment for communications; social systems cannot be observed directly, but can only be inferred (Luhmann 1995b: 164). Accordingly, autopoiesis in these social dynamics can be explored as a hypothesis. From this perspective, Niklas Luhmann’s (1986) theory of social autopoiesis has the status of a proposal or perhaps a heuristics (Leydesdorff 2012). Luhmann was aware of this; he acknowledged upfront that “the following considerations assume that there are systems” (Luhmann 1995b: 12; italics added). During the 1990s, however, Luhmann became increasingly fascinated with George Spencer Brown’s (1969) Laws of Form, and wished to develop a general theory of observation.

This emphasis on observations – instead of expectations – makes Luhmann’s theory vulnerable to Jürgen Habermas’s (1987: 385) argument that his sociology “replaces metaphysical background convictions with metaphorical ones.” Can one raise the same objection against Hugo Urrestarazu’s paper? In this commentary, I argue that Urrestarazu’s perspective on Luhmann’s theory of social autopoiesis (§§107ff.) has remained metabiological because Urrestarazu foregrounds the agency of observers who are engaged in observable “language” instead of focusing on the use of language to improve interpersonal communications about expectations.

Can Inter-human Communications be Modeled as “Autopoietic”? Loe Leydesdorff University of Amsterdam, The Netherlands loet/at/leydesdorff.net

The dynamics of expectations in inter-human communications can be modelled as “autopoiesis.” Consciousness and communications couple not only structurally (Maturana), but also penetrate each other reflexively (Luhmann). Reflexivity opens and enriches the model of autopoiesis for further exploration.

Unlike exchanges of molecules in the biological autopoiesis of life, the communication of expectations in social systems cannot be observed directly, but can only be inferred (Luhmann 1995b: 164). Accordingly, autopoiesis in these social dynamics can be explored as a hypothesis. From this perspective, Niklas Luhmann’s (1986) theory of social autopoiesis has the status of a proposal or perhaps a heuristics (Leydesdorff 2012). Luhmann was aware of this; he acknowledged upfront that “the following considerations assume that there are systems’ (Luhmann 1995b: 12; italics added). During the 1990s, however, Luhmann became increasingly fascinated with George Spencer Brown’s (1969) Laws of Form, and wished to develop a general theory of observation.

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Expectations in social autopoiesis

The “rule of law” or market clearing cannot be considered as “existent” – res extensa in the sense of the Latin “esse” – but can be expected to operate or fail to operate to varying degrees. These are cultural domains that are not “naturally given” and directly observable. Human beings – differently from insects or apes – have access to these constructs reflexively, and one can improve on them by reconstruction in communicative processes at the above-individual level. Language is a prime candidate for such exchanges (Luhmann 2002), but the communication can also be further codified symbolically.

Urrestarazu’s assumes the six rules of Maturana, Varela, and Uribe (1974) as criteria for testing the possibility of social autopoiesis. However, his starting point (§4) is “to build an understanding of how ordinary social systems can be described” (italics added). These “ordinary” social systems comprise insects, monkey rocks, and human societies; but the discussion of human societies is postponed until §§107ff.
Furthermore, the author defines “communication” (§53) as “any kind of physical activity performed by an agent that can be ‘perceived’ by other agents” (italics added) and adds in a footnote that he wishes to avoid the assumption that “that agents are provided with high-level cognitive abilities and that a language is shared by communicating agents.”

Language is thus reduced to “languageing” as an observable production of what the author calls “collective behavioural patterns.” The author and I, for example, both produced manuscripts for this journal as behaviour, but the content of these manuscripts is back-grounded in favour of our observable behaviour (writing and reading). Perhaps one can count the words and the citations as observables; but what the words mean in different theoretical contexts is codified and not directly observable.

**Horizons of meaning in different spaces**

- **9** Not the relations among agents, but the correlations among the patterns of relations determine how the positions are (re)constructed in a vector space (Foerster 1960). For example, two competing firms can have similar positions without relating between them. Two synonyms are not often related in the same text. Positions allow reflexive systems to develop perspectives (Leydesdorff & Ahrweiler, in press).

- **10** Urrestarazu quotes Maturana that in an autopoiesis of social systems, one would be enslaved. Although one may thus be captured within a pre-modern culture or on a monkey-rock, a window of autonomy is provided to the individual by the additional degree of freedom in the differentiation among the horizons of meaning in modern societies. One does not gain access to these new degrees of freedom by remaining with the observables before expectations are specified – as selections from a symbolic order.

- **11** In his Cartesian Meditations, Edmond Husserl (1973) specified the second-order spaces of intersubjective intentional-ity as cogitatum (the uncertain subject of the communication), that is, the part of the res cogitans about which the cogitantes (the communicators) remain uncertain. Since Luhmann (1995a) added the functional differentiation among the symbolically generalized codes, the plural of horizons (cogittata) is sociologically more appropriate: horizons of meaning can be entertained by reflexive agency and meanings can be recomposed into the specifications of new expectations. Since these expectations are supra-individual in status – albeit first generated reflexively by individual minds using first-order network relations – the system can propel its autopoiesis on the basis of next-order selections.

- **12** This autopoiesis is neither physically bounded nor operationally closed; it can only be accessed reflexively. Can thus another model of autopoiesis be specified? Would not the structural coupling between consciousness and communication that Luhmann assumes, operationally close both systems? How can this “system” be open? The reflexivity in the second contingency adds an operational coupling that can open the structural coupling between consciousness and communications. Luhmann (2002) used the word “interpenetration” for this additional coupling:

- **13** This interpenetration between communications and consciousness enables us (as a reflexive agency) to move and recombine codes of communication in a space that is no longer physical, but conceptual. Again, the “rule of law” can provide an example: one can expect this order, but not without room for interpretation and reconstruction. The reflection actualizes the interpenetration. The codes of communication, however, are developed in political and juridical discourses at the supra-individual level. One has access to these discourses and can translate among them at specific moments of time (Luhmann 2013b: 115).

- **14** Husserl (1935) argued that the European sciences had entered a crisis precisely because of the positivistic focus on observables as data (“givens” instead of constructs). In an empirical design, however, carefully constructed observations enable us to test and update expectations, and sometimes to reject a zero-hypothesis. By doing so, one is able to learn at the supra-individual level, namely, in terms of discursive knowledge. The order is thus inverted between the observables and the discursive. For example, biologial systems are discursively constructed.

- **15** For example, Urrestarazu argues in terms of the biology of cognition as a biological theory. The formalization of this theory and the proposal of a “general theory of autopoiesis” can also be used as a heuristic in order to specify how the “social autopoiesis” in the communication of meaning might differ from the autopoiesis of life. The six criteria derived from the latter can perhaps be revised, while the social order of discursive reasoning is neither bounded nor closed. In summary, the failure to comply with the VM&U rules opens research questions about systems that can interpenetrate each other’s space reflexively.

- **16** Such conceptual systems are internally able to de-ontologize their boundaries and existence, but instead use observations for improving the quality of
How Can a Social System Be Autopoietic?

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> Upshot • I argue that it is possible to conceptualise the social system as autopoietic if we derive the social from the most important feature of a living being on which his relationship to the environment is based – from consciousness. This approach also allows us to solve Husserl’s problem of intersubjectivity.

1. “What is a Society?” “How is social order possible?” or, as Alfred Schütz once put it, “How are people able to ‘make music together?’” (Schütz 1951) – These have been fundamental questions of social sciences since their beginning. And an enthusiastic sword fight has also been going on around the topic of the autopoiesis of social systems since the time when Humberto Maturana’s and Francisco Varela’s theory arrived before readers. These questions are important because the unit of survival of the species Homo sapiens is not an isolated individual, but a social system. Of course, this being the case, people would like to know what a social system actually is. And as social is closely related to communication, then these issues are also of great interest for communications scholars, such as myself.

2. I agree with philosopher Josef Mitterer, who, in his book Das Jenseits der Philosophie [The Beyond of Philosophy], wrote that naïve realism has become obsolete since the works by Paul Feierabend, Richard Rotry and others (Mitterer 1992: 119). Therefore, in my opinion, radical constructivism has no reason to emphasise its radicalism solely; its real trump card is a “bottom-up” perspective, which allows us to explain how social interaction and society develop from the individual constructions of people. Basically, this means solving Edmund Husserl’s problem of intersubjectivity.

3. Against this background, the significance of the topic addressed by Hugo Urrestarazu becomes clearer. I am grateful to Urrestarazu for again raising the topic of autopoiesis of social systems, and also for the reference to the six rules defined by Varela, Maturana and Uribe, through the application of which the viability of our constructions of the social can be assessed.

4. In searching for answers as to whether autopoiesis can be conceived as a domain-free concept (§1), Urrestarazu is trying to find such definitions that would be applicable to all kinds of natural or artificial social systems, be they insect colonies, herds or packs of animals, predator-prey systems, human societies and organisations, inter-species cohabitation systems, networks of interacting robots, mixed man-machine systems, virtual intelligent agent systems, etc. (§52) In doing so, he is climbing to the upper rungs of the abstraction ladder, where the speaker and listener no longer have a mental image of what they are talking about. This leads the author to a dead end, because such general definitions of social systems are inevitably incomplete when applied to human social systems or to agents who are provided with high-level cognitive capabilities. Therefore, Urrestarazu unavoidably comes to the conclusion that social organisations seen as composed of physical agents interacting in physical space cannot be construed as autopoietic systems (§76, §90) and only some social systems “could possibly” be described as autopoietic wholes (§77). The latter are such systems, which can be seen as composed of “process-like” entities and where agents can participate as actors within processes.

5. It did not happen by chance that Talcott Parsons, and subsequently Niklas Luhmann, gave up the long-term tradition of philosophy and social sciences, which considered a human being as the elementary particle of the social community. For Parsons, social systems are composed of actions and the fundamental unit of action is the unit act (Parsons 1937: 43–45). Luhmann went even further than Parsons. Referring to the fact that the elements composing the system can have no duration, he radically temporalised the concept of element (Luhmann 1999b: 11) and regarded subsequent temporal elements, operations, as the elementary, undecomposable unit of systems (ibid: 49). Based on these considerations, Luhmann saw not only living, but also psychic and social systems as autopoietic. According to Luhmann, by means of reproduction, these systems recursively create their own elements and with them, itself as a whole. One cannot just assume that consciousness systems and social systems are “living” systems, but these systems presuppose at least the existence of life.

6. It should be recalled that soon after the theory of Maturana and Varela arrived before readers, attempts began to apply it in many areas: philosophy, neuropsychology, psychiatry, psychotherapy and, of course, in the social sciences (for an overview see, e.g., Mingers 1994). These attempts failed because the authors tried to transfer the concept of autopoiesis, which describes certain critical characteristics of living systems, directly to the social field. With his definitions, Urrestarazu returns to the pre-Luhmannian time and reaches the same result reached by numerous authors before Luhmann. Here, we can conclude that the future success of the theory of autopoietic social systems depends not on a return to the times before Luhmann but on being able to move beyond Luhmann.

7. The general starting point for solving the problem of intersubjectivity is...