

## Communication, Autopoiesis and Semiosis

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**Upshot:** We agree on the need to explore a concept of social autopoiesis that goes beyond a strictly human-centered concept of social systems as autopoietic communicative systems. But both Hugo Urrestarazu and Niklas Luhmann neglect the importance of semiosis in understanding communication, and this has important implications for the question of a more general approach to social systems.

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1. In the article "Social autopoiesis?" Hugo Urrestarazu investigates the question of whether a general definition of autopoietic systems can be made that can encompass a variety of social systems, including both human and animal systems. Humberto Maturana and Francisco Varela claimed that social systems cannot be autopoietic, and Urrestarazu cites Maturana's statement that: "If there was an autopoietic social organisation, I would not like to be one of its members, because then I would be a slave within, a robot, absolutely subordinated in all my actions to the realization of its autopoiesis." On the other hand, Niklas Luhmann has developed a highly elaborated and detailed theory of social systems as autopoietic communicative systems.
2. We agree on the need to explore a concept of social autopoiesis that is generally applicable beyond "human social systems," because we are interested in understanding "heterogeneous" self-organizing systems, such as a farm enterprise that consists of a complex network of social, technical and biological relations. For such systems it is necessary to develop an understanding of system closure that goes beyond communicative closure and self-reference in Luhmann's sense (Noe & Alrøe 2006, 2012). But, as we shall show, we think there is a need for a more general conception of communication than those of Urrestarazu and Luhmann.
3. Urrestarazu's definition of social systems builds on the concept of "physical" autopoiesis derived from Varela, Maturana & Uribe (1974), where autopoietic systems are composed of physical components. In social systems, the components are agents that are capable of modifying their behaviour upon perception of a communication event. Communication is any kind of physical behaviour performed by an agent that is perceived by another agent, and agents are coupled by causation flows that propagate as communication events. Such correlated behaviours can be distinguished as social interactions by an observer (§57).
4. In his focus on communication in defining social systems, Urrestarazu is in agreement with both Maturana & Varela and Luhmann. Maturana & Varela (1998: 195) succinctly state that: "As observers we designate as *communicative* those behaviors which occur in social coupling, and as *communication* that behavioral coordination which we observe as a result of it." And Luhmann (1995) defines social systems as autopoietic communicative systems. He states that: "The elementary process

constituting the social domain as a special reality is a process of communication.” (Luhmann 1995: 138-9), “Only communication is necessarily and inherently social.” (Luhmann 2005: 70), and “... *only* communications and *all* communications contribute to the autopoiesis of society.” (Luhmann 2012: 48). But as we shall see, these constructivist authors have widely different conceptions of communication.

5. Urrestarazu’s conception of communication is entirely mechanistic, physical and causal. A communication event is a “cause-effect coupling between the medium and an agent occurring when the agent encounters the physical results of a communication initiated by another agent” (§54). He states that “autopoietic systems should be structure-determined mechanistic entities” (§88), and refers to Varela, Maturana & Uribe (1974) for this view of autopoietic systems as mechanistic.

6. On this basis, Urrestarazu rules out the possibility for human social organisations to comply with the requirements of autopoiesis, because human action is not structure-determined and “a human social organization is not and cannot be a mechanistic system” (§90). “In summary, this makes the social system ... incapable of being construed as an autonomous – and, by extension– an autopoietic entity” (§91).

7. It is easy to sympathise with Urrestarazu’s concerns about the free will of people in human organizations and the unethical development of social structures. However, this conclusion that human social systems cannot be autonomous, and that human organizations therefore cannot be autopoietic, is problematic on two accounts.

8. Firstly, Urrestarazu’s physical and causal conception of communication seems to go against Maturana & Varela’s conception of living systems as autopoietic systems. The notion of “mechanistic” in Varela, Maturana & Uribe (1974) and Maturana & Varela (1980) means that the phenomena can be explained by laws of nature without invoking forces or principles not found in the physical universe. It is mainly used to distinguish their approach from vitalism and because they focus on machines and living systems as organized dynamic unities whose components interact and undergo transformation (Lyon 2004: 28, 32). A deeper and more essential characterisation of Maturana & Varela’s view of autopoietic systems is their key notion that: “Living systems are cognitive systems and living as a process is a process of cognition” (Maturana & Varela 1980: 13). This means that the environment can only perturb an autopoietic living system; the system determines its own reaction. This leads to a very different conception of communication than that of Urrestarazu, for whom communication is a matter of cause and effect (§54). In line with this (though Maturana & Varela did not use this terminology, see Alrøe & Noe 2012: 47), we think Urrestarazu neglects the importance of semiosis and interpretation in understanding communication. This has important implications for the question of a more general approach to social systems.

9. Secondly, the conclusion that human social systems cannot be autopoietic fails from the perspective of Luhmann because it takes human beings as components of social systems. Urrestarazu is aware of this and states clearly that his view is conceptually incompatible with that of Luhmann, where communications appear as the

components, and not the relations, of a social system (§108). For Urrestarazu, social agents are the components that must be reproduced if the social system is to be considered autopoietic, and these agents interact by way of communication events. In contrast, for Luhmann the autopoietic components are the communications in themselves that interact in a more abstract space, where human individuals are not part of the social system.

10. Urrestarazu takes this topological difference – in whether communications appear as a social system’s components or as relations – to be the main difference between his view and Luhmann’s. And hence he suggests that his and Luhmann’s views might be reconciled by way of handling these differences in the choice of space in which the system is being described. However, we think there is a deep difference in their conception of communication. This difference is crucial for the prospects of such reconciliation and, more importantly in the context of our comment, essential for the idea of a general approach to social systems across the human and the non-human.

11. Urrestarazu tries to de-correlate the notion of communication from notions such as “meaning conveyed by messages” and “interpretation of meaning” in order to provide a general definition of communication that applies across different kinds of agents, and which thereby can account for the most basic features of the notion of social system (§58). His main premise for doing this is a strictly behavioural approach to communication that deduces the occurrence of communication events based on observations of behaviour:

“The observer’s sole distinction criterion for qualifying an agent A’s activity as a communication activity is that its occurrence constitutes an event that is actually ‘perceived’ by another agent B. This ‘perception’ is deduced by the observer by observing correlated coherent regularities in the behaviour of the ‘perceiving’ agent B produced after interacting (physically) with the results of the activity of agent A.” (§53)

12. Another important basis for Urrestarazu’s notion of communication as de-correlated from meaning is his presumption that the notion of meaning is restricted to humans:

“I do not presuppose that the perceiving agent ‘knows’ anything about the origin of what it perceives or that it is capable of ascribing a ‘meaning’ to it, because agents with those capabilities (humans) are a particular case.” (§55)

We take this presumption to be highly problematic with regard to establishing a general conception of communication that is adequate across the human and the non-human. The reason is that this neglects that there is a level of reality between the causality characteristic of the physical level and the self-consciousness of persons characteristic of the self-reflexive level, namely the semiotic level characterised by perception, representation, adaptation and learning. This level of reality connects humans with other living systems and cognitive machines, and is described by semiotics as a general theory of meaning (cf. Alrøe & Noe 2012).

13. Luhmann’s conception of communication is very different from Urrestarazu’s, and Luhmann forcefully rejects the metaphor of “transmission”, and renounces an action-

theoretical (and hence “individualistic”) foundation for sociology (Luhmann 2012: 57, 45). Instead he begins with the concept of meaning, and describes communication as a synthesis of three selections, information, utterance (“Mitteilung”) and understanding (including misunderstanding), a synthesis that is produced by the network of communication as an elementary unit of a social system (Luhmann 2005: 66f, 1995: 140ff).

14. We agree with Luhmann in the focus on meaning and understanding (interpretation in semiotic terms). But we would like to point out that Luhmann’s theory is problematic with regard to the idea of a general approach to social systems across the human and the non-human for the same reason as Urrestarazu’s – namely that it neglects the semiotic level of reality. The argument is subtle, but we believe it is an important point with regard to how Luhmann’s theory can be appropriately applied.

15. Luhmann’s theory of social systems is an analytically very strong theory and we can easily be tempted to apply the theory outside the human-centered systems where it has originated. The support for such a broad application of the theory of social systems lies in the conception of communication as a general phenomenon in nature and technology. Within the field of semiotics, the relation between semiosis and communication has been much discussed (Nöth 1990: 168ff). Mostly, communication is taken as a particular mode of semiosis defined as a bilateral interaction between two organisms. Some restrict communication to human behaviour and the interaction of minds, but it is common to take communication as an organizing principle of nature involving the sending and receiving of messages by all biological organisms.

16. Though Luhmann’s theory focuses on human social systems, such considerations might lead us to apply it on a broader class of social systems, using a sufficiently general concept of utterance or message. However, Luhmann’s conception of communication rests on a distinction between living, psychic and social autopoietic systems based on the premise that psychic and social systems are not living systems (Luhmann 2005). Both psychic and social systems are meaning-using systems that are distinguished according to whether they use consciousness or communication as modes of meaning-based reproduction.

17. According to Luhmann, psychic systems are the necessary environment of social systems (and social systems are the environment of psychic systems):

“Communication ... is genuinely social in that, although it presupposes a multiplicity of participating consciousness systems, it cannot (for this very reason) be attributed to any individual consciousness.” (Luhmann 2012: 42)

and:

“Without consciousness communication is impossible. Communication is *totally* dependent (in *every* operation) on consciousness– if only because only consciousness and not communication itself can perceive sensorily, and neither oral nor written communication could function without perception.” (Luhmann 2012: 56)

18. This latter quote, taken together with Luhmann's distinction between living and psychic autopoietic systems seems to go against the key notion of Maturana and Varela that living systems are cognitive systems and more recent conceptions such as embodied cognition (e.g., Shapiro 2011; Ziemke 2012). It at least raises the question of where and how perception takes place with regard to Luhmann's types of autopoietic systems.

19. By consciousness, Luhmann means the "self-conscious" kind of consciousness characterized by thoughts, and characteristic of humans (specifically persons) as distinct from the consciousness of (most) animals, for example. Psychic systems are autopoietic systems based on the reproduction of thoughts (Luhmann 1995: 263). The fact that Luhmann's conception of communication is connected to (and presupposes) that of consciousness therefore means that it cannot be generalised to non-self-conscious and non-human communication without confronting his basic distinction between living, psychic and social autopoietic systems.

20. In conclusion, we believe that the approaches of both Urrestarazu and Luhmann are problematic with regard to the desire to establish a generally applicable concept of social autopoiesis because they neglect the importance of semiosis in understanding communication. We suggest that Urrestarazu and others who wish to explore a more general approach to social systems need to focus on the level between the causal and the (self-) conscious, namely the semiotic level, and a semiotically inspired conception of communication that can be applied beyond human-centered social systems.

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Received: 28 January 2014

Accepted: 10 February 2014