

Luhmann and the Sociological Turn in Constructivism

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> Context • Niklas Luhmann is considered to be a major proponent of the constructivist movement who based his highly complex sociological theory on constructivist concepts such as Maturana's autopoiesis and Spencer Brown's distinction. **> Problem** • Despite heavily borrowing from constructivism, there are doubts as to whether his epistemological standpoint was properly constructivist. **> Method** • In six papers and 14 Open Peer Commentaries, Luhmann's epistemological understanding, understanding of science, and use and development of constructivist concepts is examined. **> Results** • The authors' papers and commentaries cover a broad range of topics including the concepts of the observer, meaning, environment, and structural coupling. **> Key words** • Luhmann, Maturana, Kant, observer, realism, autopoiesis, structural coupling, meaning, social system, epistemology.

Introduction

1984 marked a turning point in German sociology. In this year, Niklas Luhmann published his book *Soziale System* (Luhmann 1995) in which he started to base his thinking on concepts borrowed from scholars of radical constructivism (RC) and second-order cybernetics, most notably on Humberto Maturana and his theory of autopoiesis (1970) and on George Spencer Brown's (1969) laws of form. Luhmann himself called his constructivist approach "operative constructivism" and brought about what Bernhard Poerksen called the "autopoietic turn in sociology" (Poerksen 2004: 78). Clearly, Luhmann was considered one of the major proponents of the constructivist movement in German-speaking countries in the 1980s.

However, Luhmann's relationship to constructivist approaches is not free from doubts. Most prominently, Maturana himself rejected the idea that the concept of autopoiesis could be transposed to sociology:

“‘Thank you for having made me famous in Germany,’ I said to Niklas Luhmann, ‘but I disagree with the way in which you are using my ideas.’” (Maturana in Poerksen 2004: 78)

Maturana argued that it is incorrect to apply autopoiesis to social systems because in the original definition, autopoiesis refers to a network of self-reproducing molecules, i.e.,

“‘a network of processes of production (transformation and destruction) of components that produces the components that: (i) through their interactions and transformations continuously regenerate 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 realizations as such a network.’” (Maturana & Varela 1980: 79)

However, Luhmann's fundamental entities were not molecules but rather communications such that a social system is essentially an autopoietic network of communications. This violates the original definition of autopoiesis because in contrast to molecules, which reproduce themselves without exogenous help, communications need human beings in order to be brought into existence:

“‘[Biological] autopoiesis takes place in a domain in which the interactions of the elements constituting it bring forth elements of the same kind [...whereas] communications can only produce communications with the help of human beings.’” (Maturana in Poerksen 2004: 78)

Given the complexity of Luhmann's work, it may be wrong to conclude that he was not constructivist in his thinking. In particular, Luhmann's central concept of communication evades easy interpretations such that Maturana's disapproval may seem rash. In an interview, Ernst von Glasersfeld admitted

“‘I have great difficulties with Luhmann... I have difficulties understanding specifically what he means by communication. His communication becomes such a basic term in his philosophy that I'm not sure what he means by it.’”¹

To assess Luhmann's relationship to constructivism in general and to RC in particular, we asked contributors to this special issue to reflect on various topic areas such as:

- 1 | Luhmann's epistemological understanding in accordance with or in contrast to (radical) constructivism.
- 2 | Luhmann's understanding of science (including understanding of truth) in accordance with or in contrast to (radical) constructivism.
- 3 | Luhmann's use and development of typical constructivist concepts such as self-reference, self-organization, autonomy, autopoiesis, second-order cybernetics, observation, and second-order observation, etc. Their conceptual borrowing by Luhmann should be critically examined.
- 4 | What (radical) constructivism can learn from Luhmann.

In the remainder of the editorial, we provide an overview of the contributions that we received and attempt to find answers to these questions.

1 | Glasersfeld E. von (2001) Constructing communication. Available at <http://www.univie.ac.at/constructivism/papers/glasersfeld/glasersfeld01-interview.html>

Contributions

In the course of our correspondence with potential contributors who were asked to shed light on these four questions we could not help noting a particular impression: while Luhmann is still highly respected in general sociology, his link with constructivist approaches seems to have weakened – at least when perceived from sociology. Out of the many scholars we encouraged to contribute to the special issue, we eventually accepted only seven authors who expatiated on the *constructivist* significance of Luhmann's work. Is Luhmann just no longer *discussed* so much in constructivist circles? We decided to trigger a scientific discussion in advance of the publication of these articles and invited scholars to write Open Peer Commentaries (OPCs) on the main articles, focusing on a few aspects they could either criticize or support with additional arguments and evidence. All accepted OPCs were to be published together with the corresponding article and a response from the article's author. To our great delight, so many people took up the challenge and provided commentaries exploring many additional aspects in Luhmann's writings and in related authors that each main article is accompanied by two or three OPCs.

In the following, we summarize all the main articles, OPCs, and responses, ranging from epistemological to sociological to computational aspects.

The first paper in this collection introduces and elaborates the doubts regarding Luhmann's status as a constructivist. In "Constructivism and Theory of Social Systems. Luhmann's Ambivalent Epistemological Standpoint," **Armin Scholl** analyzes the epistemological foundations of Luhmann's theory, comparing it with the basic assumptions of radical constructivism. In particular, Scholl pursues the question of whether Luhmann's theory is closer to realist or to constructivist approaches. He concludes that although there are differences, these differences should not be considered fundamental. This is because Luhmann is clearly closer to constructivism than to realism since he shares most of constructivism's key concepts, such as self-referential logic, a strict relation between observer and observed, and the relativism of reality construction.

In her open peer commentary "Who Observes? An Appropriate Theory of Observation is in Demand," **Heike Egner** focuses on one of these key concepts, i.e., the observer. According to Egner, Luhmann transcends the concept of observation by transferring it from the micro level of individuals to the macro level of society and by stating that *all* autopoietic and self-referential systems are capable of observing. Egner draws attention to the fact that in Luhmann's work, the concept of observation is too abstract to be of value for the epistemology of constructivism.

In his OPC "What Exists between Realism and Constructivism?," **Armin Nassehi** critically reviews the opposition of realism and constructivism. He argues that Luhmann's epistemological standpoint cannot be classified within the categories of realism and (radical) constructivism and argues in favor of the concept of operation to escape the dispute between realism and constructivism.

Scholl responds to Egner that the very abstract concepts of observation and of communication must be redefined within the context of psychic or social system in order to work as useful concepts to characterize them. An over-abstract conception of both observation and communication would fail to solve this problem. In his response to Nassehi, Scholl emphasizes the importance of taking the core ideas of radical constructivism seriously and not trivializing them by reducing RC to any kind of idealism or anti-realism. He insists that Luhmann's operative constructivism mainly follows a constructivist rather than a realist epistemology.

The second paper in this special issue delves into the historical influences in Luhmann's thinking. **Eva Buchinger**'s "Luhmann and the Constructivist Heritage: A Critical Reflection" critically evaluates the innovativeness of Luhmann's attempt to replace the Kantian transcendental/empirical distinction with his system/environment distinction. Furthermore, it discusses the relationship of the respective philosophies of various scholars (Husserl, Piaget and von Glasersfeld, von Foerster, and Maturana & Varela) with Luhmann's theory and terminology. Buchinger arrives at the conclusion that Luhmann's contribution to constructivism – while original and inspiring – is innovative only in the context of his stringent theory architecture of autopoietic meaning-based systems.

In his commentary "A Circular Comment on Luhmann as a Question Generator," **Karl H. Müller** shows that Luhmann can be viewed as a valuable question-generator whose heritage for radical constructivism lies in the original and inspiring effects these new and additional questions may produce. He argues that these effects are particularly relevant for those who look for innovative hypotheses in scientific disciplines such as linguistics, evolutionary theory, and sociology.

Bernard B. C. Scott's "On Reading and Critiquing Luhmann" focuses on how Luhmann's concept of meaning processing and his distinction between psychic systems and persons relate to other authors who emerged from the cybernetics movement, in particular to Gordon Pask's elaborate body of work and to Scott's own contributions in this field. Furthermore, he joins the circle of those who have concerns about Luhmann's use of Maturana and Varela's autopoiesis concept.

Randall Whitaker also voices his opposition to Luhmann. Drawing on a profound knowledge of Maturana and Varela's work, he points out that Luhmann's generalized concept of autopoiesis does not correspond with the original biological concept developed by Maturana and Varela, partly because Luhmann was not careful when distinguishing operational from organizational closure. While Whitaker admits that Luhmann managed to consolidate a "kaleidoscopic array of sources," he has doubts as to whether the details were elaborated properly and thus urges a critical re-examination of the cybernetic roots of Luhmann's work.

In her response, Buchinger concedes that there are some details in Luhmann's theories, such as the notion of binary coding, that could be improved by, e.g., empirical investigation and application. She maintains, though, that Luhmann was successful in conceptually interlinking meaning, language, and information. Addressing the "autopoiesis" criticism, Buchinger downplays the actual importance of Luhmann's borrowing for autopoiesis as for him it was a conceptual vehicle rather than a formal one (thus avoiding the need to examine it against the six criteria put forward by Varela, Maturana, and Uribe). In the end, what counts most for Buchinger is his fruitful theoretical framework rather than his "reckless" treatment of the scientific heritage.

Another central notion in Luhmann's work (and in constructivism in general) is the concept of the environment. **Hugo Fjelsted Alrøe** and **Egon Noe**'s "Observing Environments" goes to great lengths to portray and compare the different nuances. The authors present a consistent treatment of the concept of the environment in Luhmann's theory and in the work of Jakob von Uexküll and Maturana & Varela, and their respective relevance to problems of environmental sustainability. They argue that one needs to distinguish between inside and outside perspectives on the environment, and identify two very different and complementary logics of observation – the logic of distinction and the logic of representation.

Alrøe and Noe's survey attracted three commentaries. In "The Construction of Embodied Agency: The Other Side of the System-Environment Coin," **Tom Ziemke** addresses the notion of agency in constructivist theories. In particular, he is concerned with the requirements for artificial agency in robotic systems that interact with and adapt to their environments, i.e., with situated and embodied cognition. Ziemke remains skeptical as to whether Luhmann's work is particularly helpful because he did not address biological details and thus had little to say about embodiment and ontogenetic adaptation.

In contrast to Ziemke, **Karl-Heinz Simon** considers Luhmann also important when it comes to discussing biological organisms. His commentary "Multiple Environments!?" emphasizes the importance of structural couplings. Simon considers them relevant for dissolving the apparent contradiction between autonomy and dependency of systems.

The third OPC is titled "The Complexity of Environment in Social Systems Theory" and is written by **Bernhard Freyer** and **Rebecca Louise Paxton**. It asks whether, in addition to the extensive nature of von Uexküll's environmental terminology, other environments can be distinguished in Luhmann's theory, and how malleable the system/environment distinction is to redefinition and interpretation from multiple perspectives. The commentators argue that the complexity yielded by an unpacking of the term "environment" sheds light on the difficulties in finding common understandings for solving wicked environmental problems.

In their response, Alrøe & Noe concede that Luhmann's simple and rather conventional typology of systems is challenged by various problem cases studied by the authors and the commentators such as farming systems, scientific disciplines, and embodied cognition in robotics. Still, they stick to their recommendation that Luhmann's theory of communicational social systems is a helpful perspective on the wicked problems. However, the details of how to apply it in conjunction with other perspectives such as embodiment are still in the making. (As editors we could not help but notice that the fact that the concept of self-organization is used differently in the response than by Maturana should be considered evidence that it is integrated differently in different encompassing theories – as exemplified by Luhmann's idiosyncratic application of this concept to social systems.)

Yet another key concept of Luhmann's theory, i.e., meaning, is at the focus of **Raivo Palmaru**'s contribution "Making Sense and Meaning: On the Role of Communication and Culture in the Reproduction of Social Systems." He criticizes Luhmann's concept of meaning as too weak to explain the autopoiesis of communication. Instead, he separates social sense and individual meaning and argues for the concept of culture as a link between both of them.

Tino Meitz's OPC addresses the implications arising from socializing observer-dependent heuristics. He calls into question Palmaru's terminology and argues that its conceptual deficiencies with regard to the relation between an observing system and its environments cause naturalistic fallacy.

"Why Culture?" asks **Martin Zierold** in his commentary and he argues that Luhmann might have had good reason to be hesitant to utilize the term. He worries that definitions of culture such as those Palmaru provides may either be too vague or in danger of becoming essentialist.

In his response, Palmaru insists on the concept of culture as a helpful and necessary missing link in Luhmann's very abstract conception of communication. Palmaru justifies his conception of culture with the findings of his empirical research. Furthermore, he contrasts RC to Luhmann's concept of communication because RC includes the individual's sense making in the process of communication (as does, e.g., S. J. Schmidt).

In another sociologically oriented paper on "Radical Constructivism and Radical Constructedness," **Loet Leydesdorff** examines "Luhmann's Sociology of Semantics, Organizations, and Self-Organization." He emphasizes the reflexivity of human agents and their interrelationships without ignoring or denying that communication is still an entity *sui generis*. However, communication itself is individually constructed and therefore mind-based, too. It is the evolutionary development of human languages that enables human beings to connect individual meaning and higher-ordered symbolic generalizations.

In her commentary, **Kate Distin** wonders whether "Symbolically Generalized Communication Media" is a category mistake. She argues that it is correct to emphasize the uncertainty of communications that require different media for communication within and across social boundaries, but it would be a mistake to conflate the concepts of media and the symbolic communication codes that give them structure.

A very different perspective is embraced by **Roger Harnden**, who focuses on the "uneasy relation of person/culture," which, according to the commentator, must not be omitted from any serious discussion of Luhmann's work. He pleads for a fuller consideration of Maturana's work.

In his response to Harnden, Leydesdorff points out that society consists of a continuous reconstruction of expectations, which can be considered counterfactual. With respect to Distin's concern, he admits that Luhmann's very abstract concept of symbolically generalized codes may be a reason for misnomers. Leydesdorff refines his elaborations to solve this problem of understanding.

The final paper, written by **Manfred Füllsack**, deals with the modeling of communication and interaction of self-referentially closed systems. The author shows how communication can emerge between agents as a byproduct of their own internal processes of selection together with interactions with the environment and with other agents as a stigmergy. He argues that computer models of this sort may give support to considering Luhmann's constructivist conception of communication scientifically more reasonable than competing theories that draw on an irreducible quality of consensual communication.

The OPC of **Loet Leydesdorff** casts doubts on Füllsack's claim. He wonders "Is Communication Emerging or *Sui Generis*?" and presents a plea for the latter. Also, the commentary of **Thomas Kron** and **Pascal Berger** is rather critical of the premises of Füllsack's simulation model. They claim that his interpretation of the Luhmannian concept of double contingency contradicts the systems theoretical approach in fundamental ways. For them, Füllsack does not simulate a systems theoretical approach to double contingency but rather the reduction of the social to the individual psyches.

In his response to his critics, Füllsack aligns the "emergent or *sui generis*" question to the philosophical debate about emergence and downward causation. He remains convinced that with the help of digital computers it has become possible to show how unexpected macro-level properties can emerge from the interaction of lower-level components that do not show these properties. In the sense of Luhmann, such explanations oppose subject-philosophical explanations of communication.

Conclusion

Collecting and reviewing the articles and commentaries, we noticed a remarkable variety of suggestions to (a) embed Luhmann's theory of social systems into constructivist epistemology (Scholl and Buchinger), (b) refine and complement it (Alrøe & Noe, Leydesdorff, and Palmaru), (c) use it for empirical research (Füllsack), or (d) criticize it for transferring key concepts borrowed from constructivism (some of the open peer commentaries to the articles). However, debating these suggestions (cf. open commentaries and responses) more often resulted in controversy rather than in consent. So was this variety of mutually opposing opinions able to shed light on the four starting questions?

In our opinion, **Question 1** – the epistemological relationship between Luhmann and RC – remains a point of dispute. In particular, in those contributions in which RC is considered in a rather narrow sense, the differences between Luhmann and RC are emphasized. However, considering the broader context of philosophical heritage helps to clarify and evaluate the epistemo-

logical commonalities and differences. In addition to these theoretical aspects, the far-reaching practical consequences of the epistemological foundation for empirical research have only been addressed implicitly in the contributions but are certainly worth being pursued more intensively.

For **Question 2** – Luhmann's constructivist understanding of science – the contributions offer little evidence that could help to answer it. The exception was Müller's OPC, in which he emphasized the role of Luhmann as "question generator" who can provide new impulses for a variety of disciplines that are also at the center of interest for constructivists.

Question 3 – Luhmann's borrowing of constructivist concepts – was addressed in various contributions that explored the history of and differences between Luhmann and various proponents of (radical) constructivism or related theoretical approaches. Key concepts were used to show how far Luhmann worked constructivistically or, at least, agreed with constructivism. The suggestions for answering this question provoked major controversy reflecting the perspective of the authors and commentators. For scholars closely following Luhmann, the question is not whether the key concepts in Luhmann's theory have been correctly transferred but whether the theoretical architecture is consistent. Constructivist scholars are concerned about Luhmann's usage of constructivist key concepts because they are afraid that the strength of constructivist theory may be weakened. The question of whether Luhmann only vaguely and metaphorically refers to constructivists' theoretical efforts and whether this concern is relevant at all remains undecidable and probably must remain so because it depends on the very understanding of scientific theory-building in principle. Maybe this meta-interpretation of the authors' and commentators' ambitions at least hints at the way question 2 could be answered, although the contributors to this issue did not address it explicitly.

Finally, **Question 4** has been answered in both directions: what (radical) constructivism can learn from Luhmann and how Luhmann's theory can be extended or refined by constructivism. In their respective articles, Alrøe & Noe examine the concept of "environment," Palmaru discusses the concept of

"meaning," Leydesdorff operationalizes the concepts of autopoiesis and structural coupling, and Füllsack implements computer simulations of Luhmannian concepts. Again, these suggestions have been the object of debates as to whether mutual applications (of Luhmann's concepts for constructivist theory building and vice versa) are justified in terms of internal consistency or not. Such controversies show that it is worth relating Luhmann's theory of social systems to constructivist approaches, although the right way to accomplish mutual applications has not yet been found. Perhaps building a consensus between both theories is not even possible because the concerns about abandoning internal consistency and argumentative strength prevail over the necessity for inter-theoretical development.

Our special issue on Luhmann's relation to and relevance for constructivist approaches voices the contributors' will to risk the venture of theoretical bridge building. Although Luhmann's theory of social systems appears to be a very complete endeavor, it is ambitious enough not only to conserve the achievements of the theory but also to develop it further to keep it flexible for solutions to new problems. In his obituary for Niklas Luhmann, Bernd Hornung (1999) wrote of the theoretical sociologist, who died the year before, that "beyond being a great theorist, he was a great person." In the light of the contributions to this special issue, we believe the *final* answer to the question of whether he was a *great* constructivist too is still pending. However, this is not something to be concerned about as it is an incentive to further research and scholarly discussion, for which the present issue has laid the foundations.

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