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Andrei Gorianov and Maria Volkova

Double Contingency as a Bridge between Pragmatist Traditions: From Face-to-Face Interaction to Interactive Kinds

This paper explores the concept of double contingency as a foundational mechanism that brings together two intellectual trajectories within pragmatist thought: the sociological tradition of face-to-face interaction, rooted in symbolic interactionism and ethnomethodology, and the pragmatist philosophy of science, exemplified by Ian Hacking's notion of interactive kinds.

It argues that Niklas Luhmann's (1951) systems-theoretic reinterpretation of double contingency offers a shared conceptual framework for understanding how social order emerges both in interpersonal encounters and in recursive engagements between social groups and classificatory systems employed by the state, science or media.

Many developments in micro-sociology, including symbolic interactionism and ethnomethodology, are grounded in a pragmatist understanding of action and meaning. George Herbert Mead's (1934) work serves as a key point of connection between these traditions, offering a view of the self and social action as emergent from processes of mutual orientation.

Building on this view, Talcott Parsons introduced the concept of double contingency to describe how social interaction depends on participants anticipating and responding to one another's expectations.

Anne Rawls (2019) argues that Garfinkel's (1967) concept of reflexivity — developed independently in the same post-war period — captures the same basic interactional logic that Parsons described as double contingency. Both thinkers recognised that in any interaction, each participant acts based on expectations about how the other will behave, while assuming that the other is doing the same. However, Garfinkel grounded this dynamic not in abstract systems but in the organisation of everyday routine practices. He argued that this mutual dependency could only be studied at the level of face-to-face encounters, where participants continuously monitor and adjust to each other's behaviour in real time.

While this tradition focuses on interaction-in-its-course as the site of social order production, a parallel line of pragmatist thinking in the philosophy of science — exemplified by Ian Hacking (1999) — posits interactive kinds as categories that act back on the people they classify. Hacking's examples, ranging from "multiple personality disorder" to "child abuse," describe how people respond to being classified and how classifications adapt in turn. This

introduces a different but related form of mutual adjustment: not between persons per se, but between groups and scientific or state classifications.

We argue that bringing Garfinkel and Hacking into dialogue could be analytically productive, as both offer accounts of how social reality is constituted through recursive processes of mutual orientation and adjustment — albeit at different levels of analysis. Garfinkel focuses on the sequential, embodied production of recognisable action within local, face-to-face encounters. Hacking, by contrast, traces how classificatory frameworks and the individuals or groups they address co-evolve over time, shaping and reshaping each other. Despite these differences, both approaches share a central concern with how social order is continuously produced through coordination under conditions of uncertainty. This paper argues that Niklas Luhmann's systems-theoretic formulation of the double contingency problem offers a conceptual bridge between these perspectives. His theory makes it possible to analyse how interactional processes unfold across levels of scale—from micro-level encounters to engagements with institutional categories—by foregrounding the structurally necessary opacity and mutual observation that characterise all social systems. Whether in interpersonal encounters or in interactions with classification, both involve recursive loops of expectation, anticipation, and adaptation. The paper presents two empirical cases to show how this shared architecture of interaction unfolds in practice.

The first case examines how transnational couples navigate bureaucratic scrutiny under UK visa regimes. Drawing on ethnographic material and interviews with couples and civil registrars, it shows how couples engage in self-presentation based on assumptions about how they are being evaluated. In the UK, couples applying for marriage visas must undergo registration procedures in which civil registrars assess whether the relationship appears genuine or potentially fraudulent. These registrars, although not immigration officers, are tasked with reporting suspicious cases to the Home Office, and are thus drawn into a classificatory infrastructure. At the same time, the Home Office relies on algorithmic tools to flag potentially high-risk applications, without disclosing the criteria used. As a result, no actor involved possesses full knowledge of the classificatory system: couples do not know what registrars are looking for; registrars are unaware of how the algorithm functions; and the algorithm itself operates as a black box. Yet all participants act as if the system follows a coherent rationale, orienting themselves to imagined legal and institutional expectations. The result is an escalating feedback loop of mutual adaptation rooted in double contingency.

The second case analyses field interviews between journalists and public figures at the St. Petersburg Economic Forum. Drawing on conversation analysis and multimodal video data, the study shows how journalists and

interviewees negotiate whether an interview is happening at all. Because these interactions occur outside studio settings—"on the move," amid events—participants must co-produce the institutional form of the interview in real time, often without clear cues. Journalists and newsmakers engaged in "field" interviews at forums operate without a clearly predefined interactional frame. Journalists who "catch" high-profile newsmakers and attempt to draw them into a conversation within the public space of the forum are forced to construct the frame of the interview on the spot — negotiating whether this is an interview at all, whether it will be just a couple of questions or develop into a full-fledged exchange.

This is precisely a situation of double contingency: the journalist doesn't know how the speaker will respond, while the speaker doesn't know whether they are entering into a friendly conversation or walking into a trap — a moment of public provocation where the journalist demands an immediate comment on a matter of significant public concern. Thus, the interview does not emerge as a ready-made institutional form, but as a mutual procedure of meaning stabilization, in the logic of Luhmann.

Together, these cases demonstrate how double contingency underlies both micro-level social coordination and broader interactions with institutional systems.

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Andrzej Stawicki

Synergy without Merger: A Luhmannian Analysis of Coupling Entrepreneurial University and Co-Governance Programmes

This paper explores the interaction of institutional programmes from two distinct functional systems—science and public policy—through the lens of Niklas Luhmann's social systems theory. Drawing on findings from an ongoing action research project in Lublin, Poland, the paper analyzes how a university's entrepreneurial transformation interacts with a municipality's co-governance strategy, and what conditions enable meaningful cooperation without compromising systemic autonomy.

In Luhmann's framework, functional systems operate with distinct binary codes: science communicates in terms of truth/falsehood; politics in terms of power/effectiveness. Programmes, understood as conditional decision premises, enable systems to apply their codes and to structurally couple with their environments. The entrepreneurial university programme attempts to couple science with political and economic expectations—emphasizing innovation, applied research, and responsiveness—while retaining internal scientific criteria. Likewise, the co-governance programme invites input from science and civil society while maintaining political legitimacy and decision-making authority.

Our empirical work focuses on mechanisms of structural coupling between these two systems. These include formal knowledge transfer arrangements, evidence-based policy practices, and co-created problem definitions. Workshops between researchers, city officials, and NGOs allowed for shared framing of local issues—enabling both systems to engage on compatible terms. However, tensions remain. First, conflicting temporalities emerged: research operates on longer timeframes than policy cycles, leading to mismatched expectations. Second, accountability regimes differ: scientists are evaluated by peer review, while policy actors respond to democratic and managerial pressures. Third, legitimacy standards diverge: the scientific community values methodological rigor, while public institutions emphasize responsiveness and visibility. These misalignments illustrate the difficulties of translating communication across systems with different codes.

Despite these challenges, we identify conditions for programme-level synergy. These include: 1) clear boundary management, 2) dual framing that satisfies scientific and public legitimacy, and 3) institutionalized reflexive learning processes. When present, these conditions allow for structural coupling

without merging codes—enabling each system to remain operationally closed yet mutually responsive.

Our research suggests that functionally differentiated systems can cooperate productively through carefully designed programmes. In this case, science supports more adaptive governance, while public policy enhances the relevance and application of research. This reinforces the idea that structural coupling via programmes can contribute to resilient, reflexive policy systems—particularly in complex, uncertain environments.

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Augusto Sales

The Good Life as a Pluriverse Construct: Programmes, Systems, and Meaning

The concept of the "good life" has historically been a cornerstone of philosophical, cultural, and societal discourse, evolving from ancient ideals of virtue and harmony to modern pluralistic interpretations. This paper examines the good life through the lens of Niklas Luhmann's social systems theory, presenting it as a dynamic, emergent construct shaped by systemic communication and meaning-making processes. In functionally differentiated societies, domains such as the economy, education, and media offer distinct, often conflicting programmes for how to live well, establishing conditional logics under which decisions and aspirations are framed (Veenhoven, 2013; King & Napa, 1998). These systemic programmes function as decision premises that guide inclusion, attention, and legitimacy, generating paradoxes and tensions that individuals and organizations must navigate. Drawing on case studies such as productivity demands in China's tech industry (Fan, 2023), mental health challenges in education (West et al., 2010), and the media's visibility imperative (Porcedda, 2024), the paper illustrates how system-specific programmes shape competing visions of the good life. Bridging traditional philosophical inquiries with systems theory and organizational analysis, this study proposes a framework for navigating systemic pluralism, emphasizing the role of structural coupling, second-order observation, and interdisciplinary approaches to address the complexities of well-being in modern society (Rass, 2016; Willroth et al., 2023).

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Blake Cameron

Mendacious Organizing: Emergent Properties of Deception in Organizational Systems

This paper attempts to build a preliminary theoretical account for organizational deception using Niklas Luhmann's systems theory, and specifically the articulations and advancements of this approach made by the Luhmannian communication-as-constitutive (CCO) school (Seidl, 2004; Cooren et al., 2011; Seidl & Mormann, 2014). This involves configuring deception as a function in organizational systems with its own emergent properties.

To develop what such an account would offer, I review how deception has historically been addressed in organization studies. Most approaches are primarily interested in how deception can escalate from interpersonal to organizational realms, and how organizations can maintain legitimacy despite the presence of deception in their internal operations. Out of these streams, I make two contentions. First, most approaches predetermine an ethical stance, which demarcates only two possible renderings of deception as either negative amoral behavior or positive justifiable strategy. Second, deception has been commonly conceptualized as an individual action, with varied and unclear grounds for what makes deception organizational. Neither of these notions are productive to thinking about the constitute nature of deception, since they skew towards normative understandings of behavior and do not account for the many potentialities of deception. These issues find resolve in an account for deception within Luhmannian CCO thought.

To integrate deception into Luhmannian systems theory, I focus on the nature and mechanisms of decision-making discussed in Organization and Decision (2018). Centering around the issue of paradox, Luhmann describes organizations as regimes of decision-making based on three deparadoxifying operations: uncertainty absorption, decision premises, and decision-maker attributions. While the three processes go together, for the purposes of my theoretical intervention, I propose an enlarged emphasis on decision premises and specifically on one type: decision programs. Decision premises can be generally understood as "everything that has to be taken as given when making a decision," but Luhmann recasts the concept to include "only decisions as decision premises" (Luhmann, 2018, p. 181). By doing this, decision premises can be seen to "intensify intrasystemic uncertainties and put them in a form that can be further processed in the system" (Luhmann, 2018, p. 182). Luhmann calls them systemic "oscillators," since they inform intermediate future

decisions and can be used in retrospect to gage compliance or deviation (Luhmann, 2018, p. 182). Decision programs are the most coherent type of premise, since they refer to formal or informal organizational policy, directives, or criteria. They may be rooted in the past (conditional programs) or the future (purpose programs) (Luhmann, 2018, p. 221). Conditional programs are based on past input, and specifically on elements of previous decisions that the system has remembered (e.g., if X happens, do Y). Purpose programs are based on output and find their root in a stated goal (e.g.,we need to do X to achieve Y). In comparison, conditional programs offer higher specification (what to do) and lower applicability, whereas purpose programs are the opposite (high applicability, lower specification) (Aal, 2022, p. 5). Luhmann conceives of the two forms as connected, since conditional programs leave some room for flexibility (parts of the decision undefined), and purpose programs can be implemented if causality can be plausibly established (connection between means and goal) (Aal, 2022, p. 5). However, I propose that under specific conditions they may be observed as increasingly disconnected and this is the central locus of organizational deception. As the nature of deceiving is often underpinned by some form of gain or affordance (Ford & Richardson, 1994; Fleming & Zygildopoulos, 2007) in the name of a produced communicative reality, I suggest purpose decision programs are the type most easily mobilized alongside these acts. From this emerges two key theoretical assumptions. First, deception is only considered in relation to the function of decision-making communications in systems, which shifts attention away from questions of intentionality and morality. Second, deception is made organizational when present in decision-making processes.

With these guiding theoretical conditions, I discuss what the resulting study of deception looks like, especially with consideration of how systems observe their environment. As David Seidl (2004) explains, Luhmannian systems are operationally closed but interactionally open, which means that contact is governed: "the system determines, when, what and through what channels energy or matter is exchanged with the environment" (Seidl, 2004, p. 3). Since deception is generally perceived as non-normative (Ashforth & Anand, 2003), deceptive organizations have complicated relationships with their environments. I suggest that a way of studying this is by focusing on an organization's public relations, which is demonstrative of how the system expresses itself via its dialogue with the public. The dialogic turn in public relations (Kent & Taylor, 2002) supposes that the work of the field is building two-way relationships with publics; this matches the Luhmannian premise that "mutual understanding is displayed in the communications themselves, which is all that matters from a social viewpoint" (Cooren & Seidl, 2020, p. 481). I argue that the paradoxical stresses of deception in the interior networks of

communication that actively constitute organizations create dialogic modes of public engagement that variously reflect the deception. To exemplify, I assess three organizational scandals with attention to how different dialogic forms of organizational expression are invoked. I examine interactive communicative events for how the organization manages channels of dialogue with the public using a mode of engagement (pedagogical, experiential, and aesthetic).
This work contributes to both the Luhmannian branch of CCO scholarship and the timely study of organizational deception. Importantly, it challenges and provides an alternative to the longstanding value-laden paradigms of deception research. This allows for a more comprehensive view of emergent properties and what deception is capable of constituting in organizational systems.

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Chiara Piazzesi and Martin Blais

What Program for Love in the 21st Century?

In the fifteenth chapter of Love as Passion, Luhmann reckons with recent developments in the evolution of intimate systems in the West. Focusing on the observation of semantic trends that are becoming salient in the last decades of the 20th century, Luhmann suggests that semantic evolution points towards a new program for the coding of love: the "program of understanding". If "the program determines which behavior must be deemed correct and is therefore to be expected" (Baraldi et al., 2021, p. 3), the function of a program for the code of love is to identify the behaviors that ego and alter (lovers in a relationship) can observe as signs that love is still the case (hence to "correctly attribute" the "positive and negative value" of the code [Luhmann 2012, p. 217]). For Luhmann, a program of understanding implies the inclusion of the other's (or alter's) worldview, experience, and self-image into the observation of alter's behavior. Through this inclusion, ego can make sense of alter's behavior through interpretation and attribution (Luhmann 1986, p. 168). Hence, the idiosyncratic character of alter's selections is not just taken into account, rather considered as the main source of information in the decision regarding whether alter's behaviors and utterances indicate love (from ego's point of observation). Defined this way, understanding does not reduce the proverbial improbability of intimate communication, since totally understanding the other is impossible and idiosyncrasy of selections is enhanced. Instead, the program of understanding shifts the form of the code towards an orientation to the acknowledgement of intimacy as laden with problems caused by individual differences (as opposed to, say, the ephemeral nature of passion) and demanding to be treated as such. This is the evolutionary unfolding of a social system, such as the intimate relationship, whose emergence in the West serves the function of providing recognition for the individual experience of the world (Luhmann 1986). The question arises: where are we four decades later? How can we describe the current, dominant program for love, given the socio-cultural transformations of intimate experiences since the 1980s?

Our paper suggests that the program of understanding has indeed unfolded as Luhmann predicted and for the reasons that Love as Passion presented. In addition, we argue that the last decades have brought a deepening of understanding through the increasing singularization of individual biographies and intimate paths, and through the widespread penetration of therapeutic language (hence of psychological distinctions) into love semantics. The vernacular character of popular psychology is linked to its being regarded

as providing satisfactory solutions to the problems of intimacies, especially when it comes to its stabilization (as Luhmann had already noticed in the early 1980s). The circulation of therapeutic culture through different media, recently on social networking platforms (White and Hanley 2023), encourages individuals to self-define through psychological categories that foster a narrative of psychological singularity ("hardwiring", "patterns" etc.). Self-conscious individuality is encouraged (Martuccelli 2010; Reckwitz 2020) not only by therapeutic semantics, but also by consumer economy, educational institutions etc. Correspondingly, the intimate system is now explicitly expected to provide ongoing and unconditional validation for the singularity of one's worldview, experience, and self-definition (what Finkel [2010] calls the "all-or-nothing" marriage). Once made explicit, such expectation becomes subject to observational operations, hence a distinction through which the code of love is applied. Based on empirical work conducted on representations of intimacy and interviews with adult participants in Canada, our paper will suggest that the program of understanding might be gradually evolving into a program of acceptance.

We use "acceptance" to signalize a shift (that Luhmann [1986] had hinted to) in the way understanding is operationalized: if alter's experience and behavior are rooted in their psychological hardwiring (their "singularity"), the same is true for the way they can "love". This is, we argue, the logical consequence of (popular) psychological self-definitions: one cannot be blamed for being so and so – one can only be helped (sometimes by professionals) to observe one's needs and desires and find a way to respond to them. Given the idiosyncrasy of needs and desires, and the need to validate them, attuning of expectations cannot be taken for granted, for instance in terms of sexual and affective exclusivity, relationship duration, living arrangements etc. Hence, acceptance is expected from others because it is encouraged towards oneself to begin with: it is a program to treat the singularization of expectations in light of the weakening of general norms for the intimate system (e.g. monogamy, cohabitation etc.). After presenting our definition of a program of acceptance, we will discuss its paradoxical unfolding through the reciprocity that it promotes: the limit of what ego can accept from alter lies in ego's acceptance of their own limits. Hence, the present problem for intimate relationships appears indeed to be hinged on the question "what should I accept?".

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Dániel Havrancsik

Operational closure: the fine print. Remarks concerning the logic of trans-systemic intrusion on the example of political influence in science

Niklas Luhmann offers a uniquely developed theoretical framework for the description of the long-term structural evolution of modern societies in which social order is maintained by complexity reducing operations of societal subsystems having a relative autonomy. His undertaking, however, is subject to criticism due to some consequences following from his theoretical choice to consider social systems as closed systems, opposingly to the majority of other systems theoretically oriented sociological theories. It is claimed that his theory is burdened by a certain logical rigidity which limits its applicability in empirical analysis. The center of Luhmann's interest is the evolutionary formation and the operation of communication structures congealed as distinct, functionally differentiated subsystems of the society. Interconnections between the subsystems and especially among different system levels have not been investigated by him in comparable depth. The rigidity following from the application of the concept of closed systems and the respective analytical method in which motifs of detachment overshadow those of connection is alleviated by notions of interpenetration, structural coupling and program. These concepts endow the theory with a certain flexibility and may serve as clues for empirical application and its further theoretical elaboration.

Binary coding defines merely the general logic of the observations of the given subsystem. The effective performance is largely realized following programs which code defined preferences asymmetrically allowing for a better ability to orient operations. The application of programs increases the system's speed of response and its reactive ability in terms of thematic connectivity. The complexity reducing mechanisms responsible for maintaining social order rely on both types of coding. My main assertion is that in cases where the complexity reducing performance of a given subsystem drops below a certain level, interventions coming from other subsystems possessing a higher complexity reducing capacity may appear. This is realized by the transfusion of programs into the penetrated subsystem through the respective symbolically generalized communication medium of the penetrating subsystem. This event is to be conceived as an act of intrusion: when the system with a higher capacity enforces a program belonging to its logical domain upon the other, the operative logic of the latter is temporarily disrupted. Intrusion is not to be

confused with system fusion, structural coupling, interpenetration or input-output interchanges, as it is an asymmetrical relation, it is not generalized, and does not endure over time. Social systems are operationally closed but causally open – external intervention manifests itself as irritation incompatible with the system's operational logic.

In the present study I expose some of the related issues on the example of the intrusion of the political code into the scientific system. Actors oriented by the political logic and possessing the required power may temporarily substitute scientific programs with political ones thereby altering the operations governed by communication guided by the truth/untruth code of science. This act is performed on the lower system levels of institutions, movements and interactions. The ubiquitous presence of politics and the experience of "over-politicization" is a result of the complexity reducing efficiency of the political code and the versatility of the medium of power. These enable political logic to fill vacancies not occupied by other agents of complexity reduction. Needless to say, this over-expansion of politics is likely to result in detrimental consequences on the level of singular subsystems and that of the societal system likewise. --- One characteristic form of intrusion is the intervention of powerful authoritarian political actors: possessing sufficient power they are able to enforce a program favoring their domination thus deflecting it in directions supporting their interests. The code of the political system cannot replace the true/untrue code of science, but through the temporary modification of the conditions of scientific communication they de facto alter scientific performance. A permanent substitution of the code governing science – let alone the loss of its relative autonomy through a process of "de-differentiation" – is rather unlikely, as this would require effective asymmetrical interpenetration between the systems in a stabilized form. Still, even if its operative schematism remains intact, scientific communication is open to external causal influences that may trigger considerable modifications in its performance. The politicization of certain segments in the social sciences and humanities exemplifies another form of political intrusion. In this case intrusion happens "from within", due to the activity of members of the scientific community. In some disciplines, paradigms and methods, the customary programs guiding effective scientific work, are partly replaced by programs of political preference. The subsystem of science cannot maintain its autopoiesis relying solely on the true/untrue code. It needs the support of the secondary coding of scientific reputation. Among certain conditions scientific reputation can be substituted with political prestige, a less costly, thus more efficient criterion of selection. Conceiving this phenomenon merely as a case of the corruption of science would deprive us from the opportunity to examine the conditions that make the scientific system penetrable. We rather should

consider the growing frequency of such intrusions as a manifestation of a latent structural tension caused by the elevated pressure that unchanneled complexity exerts on various system levels. Due to the inherent and unavoidable structural strains of modern society, exposed by Luhmann, new patterns of complexity resolution take form. When the higher system levels of the society lack the complexity reducing capacity, irritations "trickle down" toward lower levels. Compared to functionally specialized subsystems, lower level systems have a reduced complexity resolving ability but also have a relative advantage in terms of connective flexibility – as the extraordinary plasticity of political preference codes aptly demonstrates.

Diane Laflamme

Be Warned: Ethical Programmes are open to changes, and Artificial Moral Agents could get involved

System theorist Niklas Luhmann brings forward provocative ideas in his writings on the sociology of the moral and ethics (1996), the risk of morality (1987), and the code of the moral (1993). Surprisingly, one of the tasks Luhmann gives to ethics is « to warn against morality » (1991: 90). Such a warning is needed because the binary code good/bad of the moral generates paradoxes. Conflicts and controversies thus become inevitable when communications are moralized.

Ethics is not always up to the task. To show its failure in the face of the requirements of the day, Luhmann (1987: 96) gives as an example how the most recent contribution of academic ethics to the discussion about ecological risks, ecological problems, and the self-monitoring of sciences failed in its attempt to formulate the rational principles of correct action, or to develop procedure for the application of such principles. The challenges related to the use of generative Artificial Intelligence could easily be added to this list of requirements these days.

Following on Luhmann's observations, this article issues another warning, this time about ethical programmes and their reliability. Although the binary code of the moral stays the same, ethical programmes that provide criteria for allocating the two values of the code do change historically (Luhmann, 1996: 27). Ethical programmes are to be constantly reinvented (Laflamme, 2006) in order to keep pace with the evolution of human societies. Is that a curse? Or could it be a blessing? Looking for an answer, our investigation will focus on guiding distinctions and their contribution to the production of meaningful thoughts, communications and behavioral expectations.

In Luhmann's theorizing, distinguishing distinctions is the operational mode that makes possible both moral coding and ethical programming. With the rise of digital technology spurring a rapid transformation of social theorizing and research (Roth, 2023), the interdisciplinary study of ethics is given an opportunity to expand its theoretical framework and gain new insight into the workings of influential distinctions such as the one between codes and programmes (Luhmann, 1993: 999). Another useful warning would be to not shy away from this challenge.

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Dong-hyu Kim

Platformisation of University

This study examines the evolving role of universities within innovation systems and entrepreneurial ecosystems, highlighting the transformative shift from the traditional model of the university-as-provider to the emergent paradigm of the university-as-platform. It first delineates the functional roles of universities within the context of innovation systems, positioning them not merely as knowledge producers but as central, interactive agents embedded in regional and national innovation landscapes. It then critically investigates the emerging phenomenon of university platformisation, wherein universities transition into orchestrators of digitally mediated, multi-stakeholder ecosystems. This shift engenders new strategic tensions: the erosion of epistemic autonomy through algorithmic integration, the displacement of the public good by platform capitalism, and the standardisation of pedagogical content at the expense of local diversity. While platformisation introduces new opportunities for value creation and engagement, it simultaneously poses risks of mission drift, commodification of knowledge, and the decline of critical disciplines. Drawing on Niklas Luhmann's works, this study also explores the different types of semantic re-description through which universities tend to conceal these emergent tensions—strategically reframing market-aligned shifts as innovation, inclusion, or excellence. The findings call for a critical reflection on how universities can navigate this platform transition without forfeiting their epistemic roles.

Erik Aal

Programmification. The perspective of system rationality

Projectification is a widespread phenomenon in the private and public sectors. Projects are ubiquitous in most workplaces. Organisations have increasingly reverted to projects as a means to increase their innovativeness, agility and capabilities for transformation. It is also argued that increasing differentiation in societies is associated with a higher decision density, and thus, projectification can be regarded as a response to attaining higher levels of decision-making capability.
Projectification has been accompanied by a trend of programmification. Programmification refers to the increasing use of programmes or portfolios of programmes, in order to create meaningful structures to order projects factually and temporally. Thus, programmification has become an important instrument of strategic management and institutional governance. Niklas Luhmann's Zweckbegriff und Systemrationalität (ZSR), first published in 1968, contains timeless insights into the fundamentals of organisations as social systems. However, this work is nowadays seldom referred to as most scholars draw from the 'autopoietic' theorising of Luhmann. The purpose program is a central concept in ZSR. Luhmann demonstrates how purposes, structured into configured programs of decision premises, solve the 'Bestandsproblem', that is, the quest for persistence of the system. Drawing on several basic concepts of ZSR, this paper provides an alternative perspective on programmification. This perspective reveals aspects of programmification that were so far not addressed in the literature. The paper argues that, while programmification is essentially intended to maintain strategic and governance content on lower levels, it bears the risk that the opposite may be the outcome. Programmification is inevitably associated with increasing operationalisation and algorithmisation, which may lead the organisation away from solving its Bestandsproblem, which is the principal domain of strategy and governance. The paper also extends to the issue of responsibility and accountability, and shows how these may become more diffuse as a result of programmification. Further, it is pointed out that programmification may be conflicting with the autonomy of the organisation as a social system.

Erik Brezovec and Josip Ježovita

Sociology as Science: Bridging Analytical and Systemic Approaches through the Concept of Program

Luhmann's social systems theory remains one of the most conceptually rich frameworks in sociology. Yet despite its analytical sophistication, it has often been critiqued for its limited capacity to produce concrete evidence or empirical generalizations. Its core reliance on autopoietic communication and its rejection of methodological individualism render it difficult to operationalize using the tools of mainstream sociology. Thus, this theory has often been described as self-explanatory, capable of internally justifying its categories but unable to offer externally verifiable causal claims. However, this perceived limitation arises more from the way the theory has been applied than from its core structure. Luhmann differentiates three levels of social systems: interaction, organization, and society (Luhmann, 1995). While much attention has been given to organizations and function systems, the level of interaction is arguably where the potential for empirical application lies. Within interaction, Luhmann introduces the semantic structures of person, role, program, and value. These operate as frameworks that reduce complexity and stabilize expectations. The way communication unfolds in time, what becomes sayable, expectable, or rejectable, is not arbitrary but structured by programmatic selections, often supported or legitimized by value orientations. Programs condition how roles are enacted and how persons are engaged, while values provide normative coherence that helps maintain the plausibility of those selections.

This paper proposes that these programs of interaction can be identified and empirically reconstructed. Once detected, they serve as social mechanisms in the explanatory sense. By identifying the program that links role and person and is normatively underpinned by shared or contested values, we uncover the mechanism that structures communicative flows and outcomes. This reframing allows us to translate Luhmann's theory into a predictive sociology; one that remains true to the theory's complexity but opens it to empirical research.

To conceptualize such mechanisms, we turn to Peter Hedström's analytical sociology, particularly his theory of social mechanisms. Hedström's approach (2005) has sometimes been mistakenly read as methodologically individualistic, but he clearly identifies as a proponent of structural individualism. His DBO framework: desires, beliefs, and opportunities, is not a psychological reduction but a structured way of modeling interaction. The

key insight is that what sociologists can observe—action in social context—is already shaped by systemic and structural forces. Thus, desires, beliefs, and opportunities are not expressions of autonomous agency, but observable manifestations of structural embeddedness.

In this light, we can reinterpret DBO components as empirical expressions of systemic programs on the level of interaction. Desires may reflect internalized values; beliefs can express prior communicative selections; opportunities are shaped by position and role structures. In the interaction and mutual dependency, these concepts become valuable in detecting patterns of interaction and manifestation of certain aspects of social systems in general. While Luhmann rejects classical notions of causality grounded in actor-based explanations or statistical generalizations, he does not reject the idea that communication follows structured paths or that certain outcomes emerge from recurring configurations. Hedström's concept of mechanisms is helpful here, not because it introduces causal laws, but because it offers a way to model how certain social outcomes become more likely given specific configurations of meaning and expectation. In this sense, mechanisms function as structured conditions of emergence rather than deterministic causes. Therefore, what DBO models reveal are not purely individual decision-making processes but the way programs function through persons. This makes Hedström's framework compatible with Luhmann's. In fact, DBO theory may offer a practical methodology for detecting programs in interaction - latent patterns that stabilize communication and shape social expectations. The theoretical synthesis proposed here operates at two levels. First, it bridges Luhmann and Hedström by translating the abstract notion of program into an empirically detectable mechanism via the DBO framework.

Second, it addresses one of the central critiques of systems theory: its lack of explanatory and predictive power.

By treating interactional programs as social mechanisms, we offer an account of how communication unfolds in time, why certain outcomes are more likely than others, and how stable patterns emerge from contingent selections. This approach also allows for a reframing of the micro–macro link, a long-standing issue in sociology. Rather than attempting to reduce the macro to the micro or vice versa, we treat the program of interaction as the structuring element that allows communication to recur and stabilize. This recursive stabilization is what creates social continuity and differentiation. It is not actors who reproduce society, but programmed patterns of communicative selection. Detecting these patterns thus becomes the sociologist's central task.

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Erik Brezovec and Steven Watson

Autopoietic programmes

In a world marked by rising political fragmentation, algorithmic governance, and institutional volatility, it has become vital to understand how structured orders of expectation—what Niklas Luhmann termed programs—shape coordination, decision-making, and legitimacy. This paper develops a theoretical framework that reconceptualizes programs as autopoietic systems: self-reproducing, adaptive systems that stabilize meaning and regulate action across complex social, technological, and institutional environments.
We build on and extend Luhmann's theory of social systems, moving beyond its focus on communication and cognition to propose the concept of autopoietic ecology: a dynamic constellation of structurally coupled systems that includes not only communication and cognition, but also behaviour, materiality, and infrastructure. This shift allows us to rethink how expectations are stabilized and reproduced across diverse domains.
We begin by tracing the evolution of the concept of programs across disciplines—from logic, cybernetics, and computer science to organizational theory, semiotics, and social systems theory. Programs, in this broader sense, include algorithms, legal codes, scientific protocols, institutional rules, and cultural scripts. Rather than viewing these as static rules or mere tools, we frame them as recursive systems that generate, regulate, and observe themselves. By distinguishing between programmatic behaviour (the routinized enactment of expectations) and programmatic action (deliberate decision-making within structured frames), we show how programs are both stabilizing and generative—producing continuity while enabling systemic adaptation.
Luhmann's theory provides the conceptual foundation for this reframing. He understood programs as generalised structures that condition what counts as acceptable behaviour across roles and situations. Programs enable complex systems to coordinate without centralized control by encoding goals and conditions in binary codes such as legal/illegal, true/false, or executable/non-executable. These codes reduce uncertainty and structure the possibilities of communication. However, Luhmann restricted the operation of programs to communication systems, treating human action and materiality largely as environmental disturbances rather than integral to system reproduction.
In response, we expand Luhmann's theory by introducing material, embodied, and infrastructural dimensions into the understanding of autopoietic systems. We argue that while autopoietic systems are operationally closed, the

functioning and persistence of programs require their recursive realization through matter, bodies, actions, artifacts, and routines. Programs are not abstract entities; they are instantiated in software code, user interfaces, bureaucratic forms, educational curricula, and technological platforms. These material embodiments co-produce systemic stability and transformation. From this standpoint, autopoietic ecology refers to the interplay among multiple autopoietic systems—social, psychic, behavioural, biological, and technological—each maintaining its autonomy but structurally coupled to others. In this ecology, programs function as connective forms that take different shapes in different systems: as mental schemas in cognition, codified procedures in institutions, routines in embodied behaviour, and protocols in technical systems. Despite these differences, programs preserve a recursive, self-referential form that evolves through feedback, adaptation, and mutual perturbation. They are ecological forms, maintaining dynamic stability across contingent and changing conditions.

Crucially, programs do not only regulate systems—they observe. Observation in systems theory means drawing distinctions that reduce complexity and generate meaning.

Eva Šerá

Reprogramming Employability: Self-Efficacy and Work Ability as Recursive Codes in Aging Workforce Systems

This paper explores how employability among older workers is shaped by recursive meaning-making programmes that reconfigure traditional distinctions between ability, motivation, and age. Building on Niklas Luhmann's theory of self-referential systems, we reconceptualize Work Ability (WA) and Self-Efficacy (SE) not as static, measurable traits, but as autopoietic subsystems within a broader work capability system. These subsystems reproduce themselves through recursive loops of self-confidence, self-engagement, and self-development—constituting a Cyclical Meaning Pattern that operates as a programme of sustainable employability.

We critique the Work Ability House as a classic example of organisational programming that relies on functionally stratified, codified floors (e.g. health, competence, motivation), and instead propose a recursive, code-transcending architecture of employability. Through fuzzy similarity modelling of cross-national survey data (Czech Republic, Hungary, Poland, Slovakia, N = 1,306), we demonstrate how older workers construct operational and supportive ability forms that dynamically couple subjective meaning and systemic feedback. These fuzzy-coded configurations challenge binary classifications of employable/unemployable and instead reflect a third value logic, in Luhmann's sense, where soft distinctions, ambiguity, and emergent meanings become functional.

Our model also engages the broader concern with digitalisation: fuzzy logic not only operationalises emergent meaning structures but also mirrors how digitally-mediated work increasingly transforms analogue ability descriptions into algorithmically actionable signals. We thus interpret SE and WA as programmes of the self, recursively coded through workplace feedback, digital monitoring, and internalised expectations. This reflexive programmability of older workers positions them not at the periphery, but as active agents in reprogramming employability through systemic self-reference. In doing so, the paper contributes a novel perspective on how organisations might transcend ideologised programmes of decline and instead foster recursive, meaning-based architectures of sustainable performance and inclusion.

George Alexiou and Jonathan Harth

The Programmed Organization: Decentralized Autonomous Organizations and the Transformation of Organizational Decision Architectures

In an era of increasing digitalization, Decentralized Autonomous Organizations (DAOs) represent a radical break with traditional organizational forms. DAOs are digital organizations functioning without central leadership, making decisions through smart contracts on blockchain systems (Jungsuk et al. 2025; Augustin et al. 2022). Unlike traditional organizations where programs are communicated and legitimized, in DAOs they are coded and executed mechanically. Following Luhmannian systems theory, we examine whether DAOs represent a new form of "programmed organization." Luhmann's organizational theory identifies three central decision premises: decision programs, communication channels, and personnel (Luhmann 2018). In DAOs, these undergo fundamental transformation:
Coded Decision Programs: Traditional organizations develop programs communicatively; DAOs implement them as smart contracts, shifting decision logic from social communication to technical execution—a depersonalization of decision processes.
Reconfigured Communication Channels: DAOs transform rather than eliminate communication. Token-based voting systems replace hierarchical command chains, enabling direct stakeholder participation. Communication becomes collective will formation rather than authority enforcement.
Hybrid Personnel Structures: The member/non-member distinction becomes fluid. Dynamic participation emerges through token ownership and active involvement (Moormann/Perscheid 2023).
Do DAOs reduce organizational intransparency or merely shift it to technical systems? While DAOs transfer blockchain transparency to organizational structures through publicly viewable ledgers, new paradoxes emerge:

1. Algorithmic Intransparency: Smart contract execution is transparent, but underlying algorithms remain impenetrable—a new "black box" (Burrell 2016).
2. Complexity Displacement: DAOs reduce organizational intransparency but generate technical complexity requiring expert knowledge (Luhmann 2018).
3. Pseudonymity and Responsibility: Radical transaction transparency contrasts with actor anonymity, challenging responsibility attribution (Luhmann 1999).

DAOs promise "trustless" operations but reveal fundamental trust transformation:

1. From Interpersonal to Systemic Trust: Actors trust code and collective intelligence rather than individual authorities (Luhmann 2005).
2. New Trust Risks: Trust in blockchain reliability and smart contract accuracy becomes central—as the 2016 DAO collapse demonstrated.
3. Trust in Swarm Intelligence: Decentralized decision-making assumes individual decisions aggregate into collective rationality.

DAOs represent new structural coupling between social and technical systems. Smart contracts function as system-environment interfaces, defining which influences trigger decisions. Automatic rule execution enables organizational self-reproduction partially without human intervention (Esposito 2017). DAOs develop "hybrid autopoiesis" where social and technical operations collaborate in self-reproduction (Lustenberger et al. 2025). This reconfigures Luhmann's organizational understanding: decisions emerge through human-mechanical interplay, system-environment distinctions become complex, and boundaries are defined by network participation rather than membership. They enable new variety management (Ashby 1957) while generating new complexities (von Foerster 2003).
DAOs represent evolution rather than revolution. They don't eliminate organizational challenges—complexity reduction, trust building, coordination—but develop new management mechanisms. The transformation from communicated to coded programs marks a qualitative leap in organizational rationality.
DAOs can be understood as "programs of programs"—meta-organizations programming new organizational possibilities, expanding social systems' evolutionary spectrum. They complement rather than replace classical forms, pointing toward a future where social-technical boundaries increasingly blur.

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Giedrė Sabaliauskaitė and Sergio Jofre

Anticipation in the context of complex systems: Is it possible or are we just guessing?

Alluding to the multifaceted roles of programmes in both the analogue and the digital contexts, we would like to bring attention towards one attribute of organisms and systems that although critical to resilience - and at times survival - it is still not fully understood: this is the process of anticipation linking systems with a temporal dimension, and the concept of a future state of affairs.

Although one might be easily temped to assume that anticipation is a trait exclusive to human cognition, there is mounting evidence suggesting that anticipation is a rather pervasive phenomenon present in and characterizing all types of realities across living and non-living systems. Thus, anticipatory theories have been proposed in fields as diverse as biology, physics, psychology, physiology, neurobiology, sociology, economics, political science, philosophy, and computer science. In the later, anticipation finds broad applications in information theory, algorithm development, and machine learning. In economics and other social sciences, it has been used as the foundation for forecast and foresight methods supporting strategic planning and intelligence in organizations. However, anticipation theory remains fragmented as no significant cross-disciplinary comparisons leading to a general framework has yet emerged. From the perspective of systems, anticipation concerns the capacity to align their behaviour according to a "reference" or "model" of the future evolution of the environment in which they exist –or in other words, as the capacity of a system to anticipate of predict its environment and adapt to changes. This theory argues that an anticipatory system – the one able to anticipate its environment – contain a predictive model of itself and/or its environment, which allows the system to change its present state in agreement with the model's predictions of future conditions.

In social systems such as business organizations, anticipation does not refer to an intrinsic property of the system, but to a strategic rational or cognitive action to forecast changes in either internal or external environments. For example, business organizations create anticipatory models of themselves as an alter-ego simulated behaviour, to help them search, formulate, find, and evaluate new strategic paths, before they make a strategic decision. Thus, anticipation capability in this case emerges from the firm´s ability to create a comprehensive predictive model of itself shaped by an environment that has its own predictive system (e.g., the market). Thus, from the perspective of social

systems, both system and environment do exhibit anticipatory behaviour. Politics for example, is an autonomous social system and an (anticipatory) environment for other social systems such as economy. When politics anticipate economic reactions though of political decisions, economy reacts anticipatorely. Yet, it is argued that the occurrence of unexpected financial crises suggests that the mere notion of anticipatory systems is not enough to explain unpredictable situations at the scale of complex social systems. Modelling complex systems is therefore not enough to anticipate emergent behaviour or unexpected events. To that end, it also required to model – and thus, fully understand– the dynamics of the environment around the system. Observing and modelling such vast number of elements, processes, and interactions on its totality is not yet (humanly) possible. In computer sciences, when the computational complexity - measured as the number of computational resources (time and space) required to run an algorithm– increased beyond available resources, the task is rendered unsolvable. However, computational efficiency might be eventually increased in the light of the quantum computing advent, where computational space increases exponentially with the size of the system, enabling an exponential parallelism that helps to solve complex task in less time.

Yet, the potential use of computational programs and codes as an alternative conceptual framework to mimic anticipatory systems in complex social systems is still speculation.

However, amid increasing urgency to address and effectively deal with emergent behaviour and unexpected problems and consequences characterizing the rise of complex systems - notably those delivering the vital functions supporting the functioning of social systems - the question of how to anticipate future events and conditions is becoming imperative. In this context, it is argued that vital societal functions - and the critical infrastructure supporting them - must be understood as complex sociotechnical systems that must achieve higher levels of awareness and resilience so to be ready to react and adapt to rapidly changing environmental conditions - broadly unfavourable - and decide amidst increasing uncertainty. Although sensical, we argue that current conceptual frameworks - programs, architectures and codes - are not enough to solve the complex problem at hand. Current anticipatory systems such as forecasting and foresight –arguably enough to support organizational strategic management of complicated problems, not complex ones– cannot support resilience of complex system. To this end, systems not only must acquire self-awareness of its own structure, purpose, and functioning but also situational awareness of the state of its environment. Failing to do so, means continuity of a rather imaginary sense of control we do not really have. This becomes evident in the light of examples about food and

energy systems, where programs and codes looking at increasing the efficiency of production to often fail to address and anticipate emergent behaviour. We still produce more food than we consume, while malnutrition is widespread, and hunger persists, adding waste and emissions, depleting resources. Similarly, it can be argued that although the share of renewable energy is steadily increasing, so does the total consumption of energy, deepening the energy crisis, becoming less resilient to environmental problems and geopolitical and security threats. Only a couple of decades ago, the anticipated future effect of enhancing wind energy– widely accepted as environmentally and socially beneficial– is now scrutinized because of "unforeseen" environmental issues arising at the end-of-life of wind turbines. What part of the program did fail to anticipate such issues? Are we using the rights codes? Can the digital or the quantum be of any help? Is anticipation in complex sociotechnical systems even possible? Using a human-environment-technology approach to complex systems delivering vital societal functions and services, we will address and discuss these and other relevant questions, hoping to contribute to the advancement of social system theory in the context of anticipation.

Gorm Harste

Peace. Observed as a self-referential communication system

Diplomacy and peace communication is in desperately need of theories of communication and deliberation. The hermeneutics of symbols and significance, the memory of losses as well as the hopes of future and potentialities are decisive in peace-building. However, often peace only follows war because wars cannot continue their broken pathways after having turned into protracted conflicts without end and therefore dissolve in hopeless despair and lack of continued sinews of resources. The paper proceeds with a systemic reconstruction of communication codes of diplomatic trust and respect in contexts of distrust.

In order not to get too easily and too naively to the point, I propose here first to take a departure and observe the realities of war and peace communication with Niklas Luhmann's systems theory of communication. In modern society, meaningful communication is constituted in differentiated forms and systems. Therefore, communication risk to code itself not merely in mutually opposed systems but in differentiated functional systems. Law does not easily speak to economy, war not to politics, ethics not to aesthetics, religion not to science.

Then, what conditions diplomatic communication? What are the programmes of trust amidst distrust?

Gustavo Markier

Toward the consolidation of AI as travel agents. From travel itinerary suggestions to an emerging tourism ecosystem

We understand communication media as devices for expressing the differences between social systems.

At the Luhmann Conference 2024, we presented an articulation between Niklas Luhmann's Social Theory and the Theory of Enunciation and Social Discourses, a theoretical and practical dimension of semiotics developed by Eliseo Verón.

In continuity with the above, the proposal is to reflect on algorithmic programs that suggest itineraries for end consumers as interfaces between social systems. AI entities, in their query interface, generate communication devices to interact with users, understood as socio-individual systems.

How do we currently know where we want to travel?

How do we obtain information about a destination?

How do we build our knowledge when designing an individual trip?

Is it possible to identify systemic recurrence patterns that are "part" of our identity as socio-individual systems or subjects integrated into a collective social system (origin/cultural group/nationality)?

How do AI itinerary suggestions impact the definition of these systemic identities? Is a new type of market emerging for destination tourism strategists to intervene in the understanding and design of AI assistant programs in order to increase their eligibility?

What will tourist destinations' adaptation and over-adaptation strategies be to be prioritized by AI? Is a communication differentiation competition emerging to influence influencers?

As consumers, will we rely on expanded auxiliary memory, as we have done and continue to do when searching on search engines?

As has happened in other areas of digital assistance, it is highly likely that a significant portion of the traveling population will gradually organize their trips through virtual assistants.

The modes of personalization in the way we prompt probably give us some room for manoeuvre. But the ways we organize responses can be systematic and guided by economic impact objectives. In terms of sustainable tourism development, it is important to preserve diversity in the ways we think about travel consumption and how we organize our personal time.

Systems and differentiation in the ways we organize travel consumption: the agenda of types of experiences is an economic fact and a way in which the

interaction between individual systems and tourist destinations, understood as systems of meaning, is expressed.
We view itineraries as interface programs for accessing tourism consumption. Currently, AI travel assistants draw on databases from the record of significant volumes of itineraries taken and shared, and synthesize proposals based on travel styles (beach relaxation, beach diving, contemplative nature, adventure nature (subgenres: trekking, recreational sailing, mountaineering, skiing); urban (cultural, language studies, entertainment (parks, nightclubs, museums), gastronomic); cruises; scientific (conferences, residencies).
An analysis of AI agents assisting in itinerary generation will be shared, seeking to determine categories in the construction of algorithms, the impact of destinations, and their relationship with databases, among other factors. One of the hypotheses to be validated is examples of itineraries as commodities, based on the number of sites visited by tourists, which are considered the most recommended. Given this scenario, what spaces remain for systemic regulation operations to strengthen diversity? The proposal is to validate whether the system generates its own "logarithmic antibodies" by promoting unconventional itineraries, specialized by styles and genres: food, wine, film and TV sets, religion, museums (with art subgenres), historical battle sites and walls, architecture, and design.
The proposal is to establish a relationship with the systemic regulation process of the adaptation designs of system actors (destination bureaus, hotels, airlines, tour providers, attractions, etc.) for a hypothetically optimal requirement of the AI Travel Agent.
Whether it will generate commoditization/standardization in the styles of these tours. And, in the eventual case, whether this bias could impact the overexposure or gentrification of the most sought-after attractions, or whether an intervention in the design of algorithms will be encouraged to highlight less frequented destinations and itineraries, in order to promote sustainable development. The emerging mode of systemic regulation will be reflected upon.

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Haruma Kikuchi, Ngan Gia Truong, and Shotaro Yagi

Hacking as Communication: Operational Closure Beyond Symbolic Mediation

While software now ubiquitously programmes everyday life, literature in social theory has paid relatively little attention to hacking—a set of communicative operations in which software programming is developed and reproduced via a binary distinction: working / not working.

This paper examines the emergence of hacking as a form of communication that gave rise to a materially enacted mode of recursive reproduction. Drawing on Niklas Luhmann's theory of autopoietic social systems, it argues that this mode of communication emerged within early software development practices—particularly through operations such as sharing, modifying, and executing source code. These operations were not coordinated by symbolic generalizations such as legality, profitability, or truth, but by the materially testable distinction of working / not working.

To understand the emergence of this communication, we examine the activities around software from the university laboratories in the early 1960s to the globalized landscape of contemporary personal technology. Hacking was the term adopted by computer hobbyists—those captivated by early computers and UNIX systems—to describe their collaborative, iterative engagements. These communities centered their communication (and fascination) on whether the software functioned—work or not work—regardless of legality, profitability, or ownership. When irritations were observed, legal language and moral ethos were introduced and gradually solidified to ensure the continued reproduction of the binary code working / not working. Responses included the Free Software Movement, the adoption of "copyleft" licensing (in contrast to copyright), and the strategic rebranding of "free software" as "open-source". We also observe the recursive, reproductive, and system-level scalability of decision-making procedures—such as distributed version control, flexible software licensing, and frequent release cycles—that enabled the system to reproduce its operations based on internally generated criteria. These practices culminated in projects such as the Linux kernel, demonstrating the capacity of this communication system to rival proprietary software in both functionality and coherence.

This argument does not locate system genesis in specific individuals or causal events. Rather, it shows how contingent configurations of practice and irritation produced conditions under which communications became increasingly self-referential—selected and continued based on prior

operations. Communication is mediated by source code that is executable, enabling a distinction that is not merely symbolic but materially enforced: it either works or it does not. Reproducibility here is not just a condition for testing but a basis for shared reference: contributors encounter, modify, and evaluate the same material instantiations, allowing collaboration to proceed through enacted proposals rather than semantic consensus. It proposes that software development communicates in a way that no longer depends on the legal code (legal/illegal), economic code (payment/non-payment), or scientific code (true/false) for its communicative reproduction, even as it remains structurally coupled to all three.

The paper contributes to systems theory by extending the discussion of code and programme beyond established systems. First, it demonstrates how a code—though implicit—can become socially effective through the contingent evolution of programmes that actualize and reinforce its operations. Second, it shows how recursive closure can emerge outside institutional settings, through materially anchored practices that gradually gain autonomy and closure. Third, it foregrounds how materially reproducible artefacts—such as source code—can function as communicative media, enabling selectivity and recursion not through symbolic generalization but through executable instantiation. Rather than tracing a single origin, the analysis focuses on how software development reproduces its own boundaries, organizes its own communications, and selectively integrates irritations from other systems.

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Jan-Inge Jönhill

How complex issues can be addressed in society without highlighting values. On programmes in Luhmann's systems theory

In everyday language programme denotes a performative ("a plan of activities to be done or things to be achieved", Cambridge Dictionary). In sociology, programme was introduced as one of a few foundational concepts defining organisations (Weber 1918/19) or more precisely, one of the premises for decision-making and person's role behaviour and actions within organisations (March & Simon 1958). Drawing on this notion of programme, and inspired also by Parsons (1951), Ross Ashby (1957) and others, Luhmann in his early works extends and generalises the concept. He distinguishes decision-making programmes/conditional programmes. The latter, which also can be defined as strategies and orders of expectations, are not merely outcomes of decision-making within organisations but serve to "condense" communication by conditioning persons role behaviour and actions in social systems more broadly. Luhmann, for example, often described his own theoretical work in terms of a theoretical programme or research programme.

In Luhmann's theory, symbolically generalised media are binary codified. These codes function as preference codes – positive values are preferred – but the codes only function when paired with their negative counterparts. For instance, in science, statements, theses, and theories are evaluated through the distinction true/false. To determine when positive or negative values apply, codification alone is insufficient. Additional conditions are required, and these can, in principle, be summarised under the term programme. Thus, a distinction code/programme, or codification/programming must be drawn. One of Luhmann's most significant contributions to the concept of programme, is his distinction value/programme. He replaces Parsons' notion of value orientation as the primary incentive for role behaviour and action in the theory of communication media with the concept of programme. Also values typically function as premises for decisions, but in a different way than programmes. One feels bound by values as if they come from outside, not as something that one has acquired or chosen. Moreover, values are not performatives. And someone who invokes the value of, for instance, health, peace, or rights does not expect contradiction; such values are typically taken for granted.

Concerning the global climate and environmental issues, arguments in favour of sustainable development have been made for about forty years. Yet, what precisely constitutes sustainability largely remains an indefinable value. However, as I argued in a previous work (Jönhill 1997), sustainable

development may function as a programme formula, i.e., as an overarching programme that can be specified across various domains. So e.g. in the form of programmes for maintaining limit values (for CO_2 emissions, food toxins, etc.), fishing quotas, recycling mandates, and so forth. Nonetheless, programmes frequently reflect paradoxes. For instance, programmes aimed at enhancing security are conditioned by increased risk-taking in modern society, rather than indicating greater control over the environment than in the past.

The aim of this paper is, firstly, to trace how Luhmann developed the notion of programme in his systems theory, from his early to later works. In particular, I focus on the importance of his distinction value/programme. In the final section, I argue that if complex issues such as the climate and environmental issues are to be managed "sustainably", or at all, by society, this must plausibly be done through globally adopted programmes within several of society's functional systems – and without highlighting values.

Jesper Tække

Programs as Technology. Towards Algorithmic Differentiation

We are currently witnessing a revolutionary transformation of society, where digital media in general, and AI in particular, are being integrated across nearly all sectors and domains.
This paper asks how organisation and technology are connected, with a specific focus on understanding the current situation marked by the growing integration of AI into society. To address this question, the article applies Niklas Luhmann's theory of social systems, with particular emphasis on his sociology of technology and organisational theory - especially the
type of decision premises Luhmann (2018) refers to as *programs*, namely, conditional and goal-oriented programs.
Although AI is often perceived as a radical game-changer, it must nevertheless be observed as a form of technology. Luhmann's theory is relevant here because it enables an observation in which AI gains sociological meaning. His theory of technology has roots in the philosophical contributions of Kant, Husserl, and Heidegger, yet it differs by not locating epistemic primacy in the human subject. In Luhmann's sociological and systems-theoretical
framework, epistemic primacy lies with the system (Bertilsson 1998). It is systems that produce knowledge, and technology plays a key role in this process, since cognition, according to Luhmann (2002), occurs through causal schemata (in line with Kant 2002). Technology, therefore, is not necessarily material in nature (Luhmann 1982: 317), as also argued by Husserl, but rather constitutes a specific form of perception - what Heidegger (1999) referred to as *das Gestell* (the frame or scaffolding). Technology is a specific mode of
cognition and governance through which social systems organise themselves internally and thereby structurally couple to their environment (*Umwelt*, "self-centered world" (Uexküll1909)).
For Luhmann (2012), technology functions as a specific coupling mechanism - a particular form of structural coupling - whereby humans, through causal structures, both material and cognitive, develop patterns that make sense internally and are momentarily viable externally.
Both psychic and social systems are, in Luhmann's terms (1988), cognitive, in that they internally relate to their environment in a meaningful way via their own linguistically mediated operations. From this perspective, technology - borrowing a McLuhanian formulation - can be seen as an externalisation of meaning structures (e.g., through administrative regulations or machines), which relieve, but at the same time bind, both the social and the psychic within

a specific horizon of meaning and possibility. Any meaning that can be observed via cause–effect relations is referred to by Luhmann (2018: 304) as *technique*, regardless of its material basis.

In Luhmann's theory of organisations, decision premises play a crucial role in how social systems - especially organisations - manage complexity and stabilise decision-making processes. Luhmann (2018: 182–183) identifies three types of decision premises: communication premises (e.g., decision-making procedures, hierarchy, and role distributions), person premises (e.g., competence profiles and recruitment logics), and programmes. It is the latter - programmes - that constitute a particularly interesting link to
technology. Luhmann distinguishes between conditional programmes and goal-oriented programmes. A conditional programme operates according to an "if–then" logic, specifyingwhich actions should be taken under given conditions. It is a form of operational standardisation in which the decision is reduced to technical execution: "if condition A is met, then follow procedure B." In contrast, a goal-oriented programme specifies the desired end but leaves the choice of means to subsequent decisions. This allows for greater flexibility but also requires more complex communication and reflection within the organisation.

From the perspective of Luhmann's concept of technology, programmes are forms of technology in a sociological sense. Technology is defined here as "the tight coupling of causal elements, no matter what the material basis for this coupling. The concept includes human conduct insofar as it takes place automatically and is not interrupted by decisions." (Luhmann 2018: 304). Decision premises prevent the process from being interrupted by renewed decision-making because the "what" and "how" of execution have already been decided. Programmes are thus such causal schemata as Luhmann observes as *technique*. They function as cognitive structures that can be executed without renegotiating meaning in every new situation, thereby enabling organisations and systems to act without having to make decisions anew each time.

From a societal perspective, this means that programmes are increasingly being taken over or supplemented by digital systems and algorithmic structures - particularly conditional programmes, which are especially well-suited for automation. AI and digital platforms are increasingly functioning as infrastructures for decision premises - and thus as technology in the Luhmannian sense - which reshapes the conditions for interaction (e.g., user interfaces and recommendation systems), for organisation (e.g., automated workflows and compliance structures), and for the function systems of society (e.g., standards for evaluation in legal or educational systems).

This coupling between programs and technology opens up an analysis of how society, through digitalization, is undergoing a functional shift in which

decision-making rationality is increasingly decoupled from reflexive communication and integrated into technologically governed infrastructures. Building on this, the article points to the emergence of *algorithmic differentiation* as a new organizing principle, whereby social systems increasingly differentiate and regulate their communication through data-driven, programmable decision structures rather than through reflexive communication.

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Jiaqi Wang

Constructing GenAI Literacy as a Programme: Design-Based Research in Early Childhood Education

With the rapid development of Generative Artificial Intelligence (GenAI) in the global context, understanding and regulating how it is coupled to the structure of other social systems has become a critical issue. Previous studies have primarily focused on the framework of GenAI literacy, often conceptualising it as a set of skills. While this perspective offers valuable theoretical support for GenAI literacy education, it falls short in accounting for its interrelations with various social systems. This paper proposes that GenAI literacy can evolve into an autopoietic programme—a self-organising mechanism of expectations and decision-making (Watson et al., 2025). Autopoietic systems are operationally closed but informationally open to their external environment. Specifically, while they maintain their structure and reproduce their components autonomously, they also engage in continuous interaction with external influences that trigger internal adaptations. Drawing on Luhmann's theory, and specifically his concept of programme as a medium for structuring decision-making, this research investigates how GenAI integrate into early childhood education (ECE) transcends the status of an externally introduced tool and becomes a meaning-mediating system within educational environments, with a particular focus on the Chinese context. A key element of this conceptualisation is the role of GenAI as a mediator of meaning rather than a static content-generation tool. Watson (2024) argues that GenAI, like other communication technologies, actively shapes meaning through iterative interaction with users, enabling dynamic knowledge construction rather than passive information retrieval. This aligns with the notion of meaning mediation, where knowledge is negotiated rather than transmitted.

Methodologically, this research employs a Design-Based Research (DBR) approach to explore how GenAI literacy can be enhanced among ECE educators in a community based in Beijing. During the fieldwork, a series of participatory teacher training sessions were conducted. In DBR, the iterative nature of this interaction suggests that GenAI literacy is not a fixed skill set but a continuously evolving practice within educational communities of practice (Anderson & Shattuck, 2012). Lave and Wenger (1991) describe communities of practice as dynamic social structures where knowledge is developed and refined through participation. In this study, teachers and other stakeholders engage with GenAI iteratively, refining their understanding and application of

AI tools based on real-time feedback and collaborative learning experiences. Regarding data collection, focus group interviews, teachers' written reflections and one-to-one interviews were employed. In this evolving programme developed through DBR cycles, teachers do not simply apply the binary code of "can use AI / cannot use AI." Instead, they engage in context-specific processing where the code of educational effectiveness interacts with legal, ethical, and technical distinctions from other systems.

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Joe Ruffell

The Albanian communist party-state as an organisational society: Jacobin programming and 'episodic' purges

In "Organisational Society" (Pollock, 1990), in distinction to a "society of organisations", functional differentiation is curtailed by the coding of operations and events through the power-centred logic of politics. Organisational self-descriptions become the dominant semantics of public life and must be referenced for communication to be assessed positively by the state. Inclusion/exclusion runs through membership of a Leninist-style party, which has merged with the state to produce a symbolic order in which political ideology is said to guide decision-making toward a communist future (Lefort, 1988). Consequently, forms of communication associated with other function systems (law, economy, art, etc.) are dominated by a heavily moralised political coding. Accordingly, under 'high Stalinism', the negative side of any political coding was loaded with semantics of criminality, inviting repression from the coercive organs controlled by the party. The reliance on descriptions of the party-state's environment which eschew differentiation between itself and society engendered a series of 'self-reference' problems (Luhmann, 2018, pp. 319-320) which ultimately led it to choose starting points for its operations with little validity (Luhmann, 1990, pp. 99-100).

Unlike most post-WWII communist states, Albania (ruled by the Party of Labour of Albania, PPSh) was distinguished by both its seizure of political power without assistance from the Soviet army and its refusal of any move toward the limited differentiation offered by de-Stalinisation after 1956. Albania's diplomatic break from the USSR and later the People's Republic of China, and its continued use of high Stalinist methods of organisation and repression into the 1980s, can be understood as an emergent system's attempt to keep its self-constructed world intact in a changing environment. It therefore provides an ideal-type for the investigation of a party-state system. PPSh attempted to guide all social processes through the (Jacobin/Leninist) ideological programming embedded in its self-descriptions to rule through "one firm and one office" with "the requisite accounting and control forcing its politics, its economy, its societal behaviour under one umbrella" (Baecker, 2002, p. 99). Therefore, a 'Jacobin conception of modernity' (Eisenstadt, 1999) in which ideas of conspiracy, the division of the social world into pure and corrupt parts, and the figure of a foreign manipulator informed its conditional programmes, steering decision-making toward 'mass mobilisation and purge' (Padgett, 2012) as favoured management strategies. Indeed, as Baecker (2002a,

2002b) contends, Leninist party management has an evolutionary algorithm that acts to detach members from non-members by making their identity fuse with the emerging system, allowing both conspiracy and betrayal to become normalised.

Insufficiently differentiated from either the Albanian state or wider society, by the 1950s the primary environment of the PPSh became other state systems (communist or otherwise) individually and in aggregate. Therefore, the logic of segmentary differentiation strongly structured both its operations and cultural semantics (as a utopian form of nationalist Stalinism). PPSh (standing for Albania) therefore re-entered its own decision premises as the positive side of a binary form. In time, the negative side of this form became almost the entirety of the rest of the international (this binary could also be recoded based on organisational personality, e.g. Hoxha/Khrushchev, or as anti-revisionist/revisionist, depending on the circumstances). This Manichean system/environment relation became the major logic of its conditional programme, with negative domestic events coded as being derived from the actions of actors in the environment. Changes in this environment, particularly changes in the politics of erstwhile allies, presented crises requiring the self-transformation of organisational routine, external relations, and cultural semantics. The purge trials which followed can be understood as a form of organisational 'episode' (Hendry and Seidl, 2003), a crisis management response where usual routines are suspended for a period, and hierarchies and communication channels are revised to correct a discrepancy between an organisation's self-description and how it perceives its environment understands it (Seidl, 2016).

PPSh's limited semantic range profoundly constrained its potential for evolution in the face of its Chinese ally's reproachment with the USA and the winding down of the cultural revolution (1972-1976). PPSh, not for the first time, turned its Jacobin coding inwards to find traitors who could be associated with classic or new antagonists: Western Europe (the 'liberal' cultural establishment), Yugoslavia (the economic managers), and China (the military). Formerly senior members of the organisation were branded as traitors, in league with the devalued parts of the environment, and excluded via execution or imprisonment. Therefore, a strong reliance on Jacobin programming allowed the organisation to find a form of autopoiesis which, while ultimately self-defeating, allowed it, for a while, to continue along in its preferred organisational and semantic routine, becoming a last bastion of hardline Stalinism before collapsing shortly after the fall of the wider communist bloc.

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Jörg Räwel

The Societally Corrupting Potential of Moral Programs

The current primary form of social differentiation, which is functional, is coming under increasing pressure. Recent examples, such as China and Russia – where there has been hardly any functional separation between politics, the legal system, and the mass media for decades – as well as developments in the USA under the presidency of Donald Trump, clearly demonstrate this trend. This study examines, from a systems theory perspective, how digital forms of communication – especially in social media – lead to the erosion of established structures of functional differentiation and bring about a renaissance of moralizing communication.

Theoretical Foundations and Research Questions

The study is based on Niklas Luhmann's systems theory and assumes that changes in the primary form of social communication (from oral to written, from written to digital) are accompanied by radical social upheavals. The central research question is: How do digital forms of communication in social media lead to an erosion or corruption of established, functionally differentiated social structures?
In contrast to the usual explanatory models, which focus on individual responsibility for social developments, this approach centers on the communication structures themselves. The study develops an abstract understanding of corruption that goes beyond the classic attribution to actors and conceptualizes corruption as an operational coupling of functionally different social spheres.

Methodological Approach

The analysis is based on a system theoretical reconstruction of the specific communication characteristics of social media and their social effects. In particular, the changed conditions of interaction systems under digital conditions are examined. The observation of dominant contemporary semantics and their relationship to social structural changes serves as the empirical basis.

The study combines theoretical analysis with the interpretation of current social phenomena, including responses to the coronavirus pandemic, identity politics movements, and media transformations in political discourse.

Key Findings

The study shows that social media creates a new form of interaction system that differs fundamentally from classic interaction systems: While the latter are characterized by fleeting communication based on synchronous perception, social media enables a permanent social presence through spatio-temporally stable user profiles. This reification of personality decouples social identity from synchronous perception and leads to an extreme moral vulnerability of digital interaction systems.
The elements of traditional interaction that moderate morality –synchronous perception and thematic focus – are largely eliminated, while the personal attribution of communication is hyper-stabilized. As a result, social media structurally privileges moral communication based on personal attribution of respect or disrespect and promotes socially unprecedented forms of moral outrage, such as "shitstorms."
The social dominance of this form of communication (with over five billion user profiles worldwide) is leading to a renaissance of moral communication, which is increasingly replacing fact-based orientations with personal, moral evaluations. This can be seen in current social phenomena such as "woke" and "anti-woke" movements, which, despite opposing positions, jointly establish a moral communication logic based on personal respect and disrespect. The coronavirus pandemic served as a magnifying glass for this development: while Sweden aimed for a functionally differentiated approach, most Western European countries relied on digital instruments for personalized behavior management, tracing social problems back to individual actions and establishing moral categories to legitimize measures.

Conclusions and Outlook

The study points to a fundamental social transformation, comparable to the transition from stratified to functional differentiation – but at a much faster pace. The culture of literacy, which once enabled a de privileging of moral communication in favor of more factual references (in functional systems), is being put under pressure by digital forms of communication that reify personality and privilege moral communication.

The result is an increasing erosion of functional differentiation in favor of a society-wide orientation towards moral programs. It remains questionable whether the "next society" will be able to maintain the level of complexity of a functionally differentiated society in view of the pronounced self-referentiality of moral communication. This research thus not only contributes to the understanding of current social transitions but also opens new perspectives for the analysis of the emerging "digital" social order.

Jules Wang

The Impact of GenAI on Employment, Algorithmic Control, & Future of Work in the Legal Profession

This study examines how GenAI reshapes employment structures, algorithmic control, and the future of work in the legal profession, addressing three pivotal questions: 1) How does GenAI automate tasks while augmenting labor? 2) Does GenAI introduce novel forms of algorithmic control over lawyers? 3) How does GenAI reconfigure power dynamics between junior and senior legal professionals? While AI's broader labor market impacts—such as displacement, productivity, and reinstatement effects—are well-documented, GenAI remains understudied as an emergent phenomenon, particularly within the legal sector. This research fills this gap by interrogating how corporate cost-reduction incentives and human agency shape GenAI's deployment, with critical implications for policies that balance automation with socially optimal outcomes.

Generative AI represents a fundamentally distinct disruption to the legal profession compared to prior legal technologies. Unlike conventional tools, GenAI leverages Large Language Models (LLMs) trained on massive datasets to process, interpret, summarize, and generate text, directly intervening in the argumentative core of legal practice. GenAI legal tools fall into two categories: open-source platforms (e.g., ChatGPT adapted for legal contexts) and industry-specific systems like CoCounsel, Harvey, and Thomson Reuters, which are trained on legal reasoning, legislation, and case law to draft contracts, conduct due diligence, and analyze disputes. These tools automate tasks historically central to junior lawyers' apprenticeship, such as document drafting and legal research, raising critical questions about skill development and professional hierarchies.

Building on Acemoglu and Restrepo's (2024) framework, this analysis argues that GenAI displaces labor in codifiable tasks (e.g., contract drafting) but reinstates demand for human skills in complex problem-solving and tacit knowledge domains. However, unchecked automation risks exacerbating wage inequality by shifting rents from workers to employers—a tension magnified in law firms, where junior lawyers traditionally ascend through repetitive, automatable tasks. Empirical evidence reveals a paradox: while GenAI boosts efficiency and marginally improves output quality, it disproportionately benefits lower-skilled lawyers, flattening performance hierarchies and destabilizing seniority-based wage structures. Simultaneously, algorithmic controls embedded in GenAI systems enable excessive monitoring, eroding

professional autonomy and redistributing power to firms.
For human rights lawyers, whose work straddles middle- and high-skill categories, GenAI presents a dual-edged sword. Automation could democratize access to justice by reducing costs but risks diluting specialized expertise, complicating efforts to balance efficiency with equitable representation. Drawing on Acemoglu and Autor (2011), the study questions whether GenAI will categorize human rights work as middle-skilled (lowering its comparative advantage) or elevate it through augmentation, potentially reducing wage inequality. These dynamics intersect with broader sociological concerns: Will GenAI redefine consent, domination, and mystification in workplace relations? Could collective resistance strategies, such as algoactivism, emerge to counter algorithmic control?

Survey data underscores ambivalence among legal professionals: 35% express hesitation toward GenAI adoption, 15% fear job displacement, and 17% view it as a major threat to employment—reflecting anxieties over deskilling and eroded billing models. Such tensions mirror debates about AI's societal implications, including its potential to reshape capitalism, democracy, and recognition between social groups. Crucially, the study argues that GenAI's labor impact is not technologically predetermined but contingent on human choices in deployment, challenging deterministic narratives and underscoring the urgency of policy interventions.

By synthesizing qualitative evidence from corporate law firms and legal tech startups, this research reveals that task automation and labor augmentation coexist unevenly. While firms prioritize short-term cost reduction, long-term stability requires policies incentivizing new task creation and protecting tacit knowledge. For instance, recalibrating legal education to emphasize AI collaboration, strengthening ethical guidelines for algorithmic transparency, and safeguarding collective bargaining power could mitigate displacement risks.

Ultimately, the study positions the legal profession as a critical site for examining shifting capital-labor dynamics. It calls for multidisciplinary collaboration to ensure GenAI adoption fosters equitable workplaces, preserves professional creativity, and expands access to justice without exacerbating precarity. By centering human agency—not technological determinism—the analysis offers a roadmap for aligning GenAI with democratic values and inclusive growth, urging stakeholders to prioritize augmentation over automation.

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Kenneth Kang

Beyond Crisis and Idealism: A Systems-Theoretical Analysis of Environmental Impact Assessment through Observation Orders

Environmental Impact Assessment (EIA) critiques currently operate within limiting normative frameworks. The ‘crisis lens focuses on efficiency limitations. The ‘ambition lens’ promotes holistic ideals but faces accusations of utopianism. Neither approach adequately explains EIA's problem-solution dynamics. Luhmannian systems theory provides a more powerful analytical framework (Luhmann, 1995).

This paper analyses EIA through three observation orders. First-order observation focuses on apparent facts. Second-order observes how observations are constructed. Third-order examines management of systemic paradoxes. Three hypotheses guide our conceptual analysis.

Map Follower Hypothesis (Fuchs, 2001, Kang, 2025) : First-order observation creates efficient environmental mapping but poor systemic connectivity. Shifting to second-order observation and scientific media builds credibility while revealing truth's contingent nature.

Explorer Hypothesis: Managing complex projections creates double contingency, risking information overload and paralysis. Legal conditional programs provide second-order mechanisms that stabilise assessment boundaries and filter overwhelming data inputs.

Seasoned Navigator Hypothesis: Operating at second-order boundaries reveals paradoxes between efficiency and comprehensiveness. Third-order observation (Luhmann, 2012) enables functional paradox management through purposive programs and strategic displacement to different societal systems.

This paper employs the EIA context of large-scale renewable infrastructure to stimulate reflection on these three hypotheses. The aim is not to test these hypotheses against reality; instead, it seeks to use this illustrative domain to explore the particular recurring problems and immediate solutions inherent to each conceptualised EIA form. This functional perspective illuminates EIA's societal purposes. It shows how specific mechanisms respond to observational complexities. When solutions misalign with problem types, credibility suffers among stakeholders.

In sum, the proposed framework transcends both 'Crisis' and 'Ambition' viewpoints. It reveals EIA processes as primarily functional responses to observational complexities rather than expressions of moral imperatives.

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Kristoffer Klement

Structures of Ideological System Programming. The Case of Sustainability in Prices

According to Luhmann's theory of social systems, programs represent a key structure through which so-called third values come into play in social functional systems such as politics, science or the economy. At the program level, values like health, peace or sustainability can affect the operative implementation of the leading codes of these systems by influencing the criteria for what is considered the right application of the codes. However, beyond those general theses it remains relatively unclear how exactly values come into action in programs and how value-saturated programs work in social systems. In my paper, I want to provide answers to these questions by presenting deeper insights into the structural complexity of system programming through the lens of the concept of ideology. Using the example of sustainability in economic price setting, I will show how ideologies like environmental protection are structurally implemented in function systems at the program level and how they contribute to the complex orientation structures of those systems at this level.
My paper is based on Luhmann's theory of ecological communication, his theory of prices, his concept of ideology, and recent studies on the justification of eco-friendly price setting. Starting from there I will show how the value of sustainability is translated into economic price programs and how it is differentiated into various layers of expectations and information, which manifest an interplay of programmes and meta-programmes that Luhmann hinted at in general but which he did not examine in detail. Within this interplay ideologies fulfil the function of establishing and justifying hierarchies between programmes and therefore play a crucial role in determining what is considered as right prices and payment operations. In the case of sustainability, this stratification can be observed with Boltanksi and Esquerre as a differentiation between prices and meta-prices in which ideologies and their correlated social interest groups fight for interpretative hegemony.

Kunwoo Kim

Programs and the Normality of Normativity: The Welfare State and the Problem of Risk

Life is constructed by the 'enforcement of administration'. Administration has shifted its mode of operation from 'infringement' to 'performance'. While the infringing administration is only negatively engaged to ensure individual freedom and property rights, the performance administration positively intervenes to promote social public good. This requires more policy program, aiming to an orientation to be socially correct. Programs, unlike codes, contain standards of right and wrong, and the more active the administration, the more programs it needs. "The differentiation of coding and programming makes the reappearance of the third value possible" (Luhmann). There is a corresponding shift from condition programs based on the black box model of input-output to purpose programs that consider more about deviations and outcomes. We calculate 'risk' in the sense that our decisions have untransparent and uncontrollable consequences. In order to cover the 'Inkompetenzkompensationskompetenz' (the competence to compensate for incompetence), code and programs become more and more differentiated, and more programs are 'supplemented'.
This is a transition from abstract and general code to programs that apply to concrete and particular cases. A program can be called a 'complex of conditions of correctness'. And administration can be called a 'the totality of institutions that create binding decisions'. As such, administration is the system that produces and enforces programs. With the transition from a liberal constitutional to a social-welfare state, more programs, more administration are generated. More programs mean more risk. The empty space between the liberal constitutional state and the social and welfare state becomes a new democratic political space, where more decisions, more programs are made. In this situation, the question of 'steering'/cybernetics arises. The question of 'positive feedback', i.e. the mechanism of deviation amplification becomes important. 'Amplification of deviations' could be translated not into imposing formal principles on reality, but into interests, feelings of justice, values that can be applied directly to concrete cases. While codes are the functional equivalent of morality and are based on the de-moralization of society, programs create a social space for the reintroduction of moral judgments by engaging value judgments in concrete cases. This leads to an inflation of moral communication. This results to the ecological problem whether the risks of programming could (not) be morally dealt with.

The question then becomes how the differentiation of code and program can be reconciled with the functional differentiation of modern societies: to what extent can a system be open to the environment without threatening the closure of the self-referential system? Does society have the ability to transform information into programs, i.e., organizational constraints, and how does that apparatus operate today? The question of how the normality of the self-producing operation of systems is ecologically compatible with the normative operation of codes and programs becomes a central issue. The question of the normality of normativity becomes the question of the program.
A program is a complex of criteria that produces meaning in that it continuously actualizes what is potential in a problem. A program makes the invisible visible, the improbable probable. It has the ability to make the potential real. However, this raises the problem of the 'combination of choice and motivation' that in the welfare state's 'performance administration' and 'service of common interest, the conditionality of choice is constrained by moral motivation, leading to an internal conflict of program complexes - a combination of cognitive and normative expectations. This creates the problem of self-producing uncertain futures and self-producing new risks. This presentation aims to explore how norms and normality of normativity are possible in such social conditions and what forms they can take.

Lars Clausen

Expedition leadership. A transfunctional approach

Provided upon request (Email: lacl@ucl.dk).

Margit Neisig

Programmable Inclusion: Observing SME Participation Through Social Systems Theory

Small and medium-sized enterprises (SMEs) play a pivotal role in driving innovation and fostering regional cohesion within modern economies. However, many SMEs face substantial barriers to engagement in large-scale societal transformations, particularly in the context of the digital and green transitions, collectively referred to as the Twin Transition. These transitions, while essential for economic and environmental sustainability, are characterized by complex, resource-intensive processes that are often inaccessible to SMEs. Factors such as gaps in digital infrastructure, technical expertise, and organizational capacity exacerbate the challenges SMEs face in this process. The exclusion of SMEs from these transformations undermines the potential for equitable societal development and limits SMEs' ability to both contribute to and benefit from the evolving economic landscape.
This paper addresses the issue of SME exclusion by offering a reconceptualization of "inclusion" through the lens of Niklas Luhmann's social systems theory. Rather than framing exclusion as a simple deficiency of resources, it is understood as a problem of programmability: the ability of SMEs to generate communications that are operational and intelligible within the functionally differentiated systems of modern society, such as the economy, education, politics, and law. Through Luhmann's distinction between codes and programmes, this paper argues that inclusion is not merely a matter of resource access but is a question of how SMEs through decision-making processes adopt structured programmes that mediate communication across various domains.
The core argument presented is that digital tools and platforms developed to support SMEs are not merely technical instruments, but in Luhmannian terms, provides semantics, that can be adopted and adapted to function as programmes in organizations decision-making. These tools embody structured semantics that SMEs can translate into their own decision premises, enabling them to align their operations with the operative codes of various social systems. Focusing on a South Baltic Interreg project—an initiative that develops an open-access digital platform to support SME engagement in the Twin Transition—this paper offers an empirical case study of how digital tools may mediate the structural coupling of SMEs with different societal systems. Through an iterative co-creation process, the South Baltic project develops tools that guide SMEs through the complexities of digital readiness,

sustainability reporting, cybersecurity, and green business model development. These tools are structured to allow SMEs to make decisions that correspond to the codes of relevant systems (e.g., the economic system's profitability, the political system's compliance, the educational system's competence, and the natural environmental system's sustainability). Applying a systems-theoretical methodology based on Luhmann's second-order observation, this paper emphasizes the importance of understanding not just the digital tools themselves, but how they function as semantics for organizational programmes that shape the conditions for inclusion. These tools do not simply provide SMEs with access to knowledge or technical support; they actively construct programmable inclusion by embedding decision-making premises that resonate with the operational logics of various function systems.

The analysis explores how the tools developed by the South Baltic project function as interfaces that enable SMEs to structurally couple with different social systems. For instance, the platform's tools facilitate engagement with the economic system through semantics for decision-making processes that align with the system's code of profitability. At the same time, the tools provide semantics for reporting compliance requirements of the political system and the educational standards for competence. By translating the complexities of these semantics adaptable for SMEs' own decision premises, the tools enable SMEs to navigate the Twin Transition.

In advancing Luhmannian theory, this paper introduces the concept of "programmable inclusion." It demonstrates that inclusion is not a static condition but a dynamic, processual achievement dependent on the design of semantics for organizations programmes that mediate participation in differentiated social systems. SMEs must not simply be granted access to resources; they must be able to interpret, navigate, and embed the decision premises as their own programmes to participate effectively in the societal function systems. This means that digital tools need not only to be accessible but also structured to enable SMEs to act within the constraints and opportunities of modern society's differentiated systems.

Furthermore, this paper highlights the recursive nature of the inclusion process. The South Baltic project is not a one-time intervention delivering tools to SMEs, but rather an iterative, co-evolving process of programming and reprogramming. Through feedback loops, participatory design, and "train-the-trainer" initiatives, the project continuously adjusts its premises in response to new insights and changing circumstances. This recursive dynamic, which the paper terms "recursive programmability," is a central feature of the South Baltic project's design. It enables the program to evolve over time, refining the

conditions for inclusion and ensuring that the tools remain adaptable to the changing needs of SMEs.

The paper also addresses the political and epistemological implications of programmability. The design of these tools is not neutral; it constitutes a form of governance that shapes the categories, distinctions, and trajectories available to SMEs. By enabling SMEs to engage with the operative codes of the policy, economy, education, and with technology and nature's sustainability as a suitable environment for social systems, these tools establish a framework for decision-making that defines what is considered relevant, actionable, and legitimate within society's systems. This process of semantic governance is central to the politics of inclusion, as it determines what counts as a valid contribution, an appropriate strategy, or a legitimate form of participation.

In conclusion, this paper argues that the future of SME inclusion in the digital and green transitions hinges not only on access to resources but on the design and adoption of program that structure the conditions for communication across different societal systems. The South Baltic Interreg project provides an illustrative example of how digital tools can function as semantics for programmes, facilitating SME participation in the Twin Transition by aligning their operations with the logics of modern society's differentiated systems. This paper contributes to both theoretical discussions in social systems theory and practical debates on the governance of inclusion, offering new insights into how inclusion can be structured through the design of semantics for programmes that mediate communication across social systems.

Massimo Terenzi

Cognitive Programmes in Algorithmic Environments: A Systemic-Constructivist Approach

In digital societies, algorithms are no longer passive tools of mediation but active architectures of cognition and communication. This paper proposes a theoretical synthesis between Niklas Luhmann's social systems theory and the autopoietic model of cognition developed by Maturana and Varela, in order to conceptualise algorithmic infrastructures as cognitive programmes. These programmes do not merely organise information—they perturb psychic and social systems, reconfiguring the conditions under which relevance, attention, and meaning are constructed.

Building on Luhmann's idea that programmes define valid decisions within functional systems through binary codes (legal/illegal, true/false, etc.), the article extends this notion to digital environments. Here, programmes are not confined to institutional procedures; they manifest as ambient structures—recommendation systems, interfaces, feedback loops—that recursively shape sense-making processes. These digital architectures modulate the visibility of content and frame decision-making in probabilistic rather than deterministic ways, encoding hierarchies of relevance into everyday user experience. Maturana and Varela's theory of autopoietic cognition complements this perspective by shifting the focus from passive information processing to structural coupling. In their view, cognition is not representation, but the self-organised response of a system to environmental perturbations. When applied to social systems via Luhmann's theory, this yields a model in which digital environments act as recursive perturbation systems. Users are not simply exposed to information; they are cognitively co-constituted through interactions with algorithmic environments that guide and filter their attention.

The platform economy, which thrives on attention capture and engagement optimisation, exemplifies this shift. Content visibility is no longer the result of human editorial judgement but emerges from feedback-driven systems where user interactions recursively define what is shown next. In this context, the algorithmic timeline is not a neutral display but a programme that pre-selects distinctions, sequences, and interaction patterns. These selections, shaped by distributed social signals such as likes and shares, become operative codes that modulate user experience and define communicative relevance.

This framework invites a reconceptualisation of programmes beyond formal rule-sets. Programmes in algorithmic environments function as cognitive infrastructures—dynamic, recursive, and relational. They guide not only what

is communicated but how communication is perceived and engaged with. The subject is not overwritten by the system but structurally nudged within an environment that encodes both the content and the likelihood of its perception.

The article further suggests that digital programmes mediate relations between users: communication is increasingly structured not by direct intention but by algorithmic translations of distributed social feedback. Thus, algorithms act as relational programmes, perturbing psychic systems not just individually but through the modulation of intersubjective visibility. In this sense, attention becomes a collectively programmed phenomenon, shaped through recursive exchanges between users and the ambient logic of platforms.

Ultimately, the paper advocates for a shift in how programmes are understood within systems theory. It proposes the notion of cognitive programmes—hybrid constructs that operate across psychic and social domains, modulating the ecology of sense. In doing so, it provides a theoretical lens to investigate the increasingly invisible yet pervasive role of algorithmic infrastructures in shaping perception, interaction, and communication in digital society.

Maximilian Kaenders

Re-searching program(me)s for an open world. Re-entered medium/form contradictions and the paradox hetero-reference of science as a social system.

This paper aims to answer a question that has received little attention in social systems theory: what is the specific function of scientific programmes for the evolution of the medium of truth and forms of knowledge against the backdrop of social structural change in the wake of the increasing technologisation of communication? In doing so, it will offer a theoretical explanation of how scientific programmes might differ from the programmes of societal organisations, because: "Any representation of communication as a 'decision' would contradict the medium of truth." (Luhmann 1968). When considering the evolution of theories and methods as scientific programmes, my paper starts from the observation that science learns from the paradoxes of observed distinctions and uses these paradoxes for self-programming (Roth 2023b), by understanding itself as a system in/of the environment of these observations and thus re-coding the distinction-related residual problems of systems in their environment as its own. Science differs communicatively in the excess of negations (preference for reflection) in its theories, thus contributing to the differentiation of society's distinctions into formal terms (Roth 2023a) and thereby making possible a surplus of what is still communicable as perceptible (Roth 2023b, Lehmann 2011). The openness of science results from its memory of expectations, which is geared towards disappointment and whose recursions link negative expectations (cognitions) to positive code values (true knowledge). The insight into its autology (Esposito 1996) leads science to distinguish between the unpredictability of society's operations and the positional dependencies of its own pasts in the temporal dimension of meaning (future of the present pasts/historicity), to allow for the oscillation between actual and possible expectations and experiences in the social dimension of meaning (meta-personality/society), and to reformat semantic redundancies in the factual dimension of meaning (ambiguity/meta-language). Its distanced approach to the structural contradictions of empirical knowledge makes science irritable to possible programming of actual meaning and thus poses a problem for the closure of its own operations. Its "specific function of keeping the world open for society" comes with the risk of losing the distance of its own data (and thus its connectivity) to social values (Luhmann 1968). With methodological closure, however, science runs the risk of inhibiting experiencing (Adorno 2021, 2023). This contradiction between

functional compatibility and an intrinsic 'eigenform' that can only be calculated by distinguishing between different value correlations poses a particular challenge against the backdrop of the increasing prevalence of technological validation of knowledge, which could reaffirm the reflection of underlying programmes of communication as a competence of science. While methodological innovation has already been driven by chance (revelation) in the segmentary structural form of society, by the convergence of thought and being (evidence) in the stratificatory structural form of society, and by the functioning simplifications of organization (reputation, scarcity, etc.) during functional differentiation, the science of the next society would have to be guided by the paradoxes of the societal interconnection and differentiation of values and data (Baecker 2025) in order to learn how to make its communicative contribution to complexity as a cultural form of a next society by reflecting on the surplus meaning that has become perceptible and apparent through electronic media (Baecker 2018, Luhmann 2012, Baraldi 2021).

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Mercedes Viviana Torero Cifuentes

Navigating Novelty: A Systems Theory Approach to the Impact of Digital Technologies on Architecture's Program and Style

This proposal draws on Niklas Luhmann's theory of the art system to examine how digital media have changed the system's internal structures. In particular, it focuses on the effects of these changes on the program of the art system, with special attention to architecture. The research employs theoretical description and conceptual analysis, bringing Luhmann's systems theory into dialogue with contemporary architectural discourse to explore how novelty is managed within the system. By interpreting these theoretical frameworks in relation to architectural ideas, the study analyzes the relationship between the architectural program and style in novelty handling and how contemporary technological changes are reshaping this relationship.

Central to this analysis is the concept of novelty, which, according to Luhmann, is understood as something that deviates from the previous, generating surprise (Luhmann and Roberts 1985, 8). Novelty is a characteristic that gained importance around the 17th century, when art began to distance itself from fulfilling the functions of other interests, such as religion, politics, or the demands of high social status. With this separation, art started to be recognized for its intrinsic value and innovation, leading to its differentiation as a system (Luhmann [1995] 2005).

Therefore, novelty played a fundamental role in restructuring the self-organization of the artistic system, as it became an essential requirement, enabling the differentiation between code and program (Luhmann [1995] 2005, 331). Before this, art was based on imitation and accepted copying, so the code alone defined what was acceptable. The demand for novelty made it necessary to introduce the program, which "compensates for the strict binarity of the code" (Baraldi et al. 2021, 181). In this way, the program establishes boundaries and possibilities for artistic creation, embracing change, the new, and adapting to the spirit of the time (Luhmann [1995] 2005, 335). However, "Novelty is not adequate as a program formula because it does not allow for recognition." (Luhmann [1995] 2005, 335). While the art system does allow for a certain degree of arbitrariness, this should not lead to an absolute rejection of preconditions. For a work to be perceived as part of the art system, it must maintain a connection with existing forms. Style plays a function here, establishing links between works, thus preventing arbitrariness.

At the same time, Style drives change by establishing new limits that, in turn, incentivize overcoming them. In this way, style encourages the exploration of

new possibilities. As Luhmann writes, "Through the substitution of a style, one can observe why (and how) art seeks the production of the new, and how after trying the possibilities of one style, it shifts towards another" (Luhmann [1995] 2005, 345–46). Therefore, style promotes novelty by creating internal conditions for innovation within the art system.

Nevertheless, style is not itself a program but rather the pre-establishment of forms with or against which one can work (Luhmann [1995] 2005, 348). The program encourages and guides the deviation from style, responding to the demand for novelty. In this process, style delimits innovation within the limits of recognition, avoiding arbitrariness. It preserves the uniqueness of the artwork while maintaining its connection to the other works of art.

In the last 30 years, architectural programs have been significantly altered by digital technologies. These technologies have enabled architecture to explore challenging and provocative forms that aim to move beyond mere variation, seeking a maximal emphasis on conspicuous differentiation (Schumacher 2013, 243). Thus, the demand for novelty, inherent to the architectural program, is now encouraged and facilitated by digital tools: "(...) objects with very complex geometrical shapes and free-form objects can only be produced at affordable cost using digital technologies" (Carpo 2011, 48). As a result, novelty becomes even more important within the system program, accelerating the pace of change and increasing the frequency of stylistic variation.

These changes in the program give rise to arbitrariness, which strains the function of style to establish lines of connection between the objects within the system. The loss of recognizability in style could lead to a reduction in visual significance (Carpo 2011, 51), and generate a communicative dilemma. In this context, this research aims to analyze how digital media have reshaped the relationship between the architectural program and style, particularly in relation to the handling and orientation of novelty within the system. The discussion centers on a possible change in style function derived from the growing demand for innovation in the architectural program driven by digital media. The thesis is put forward that the function of style in linking different objects is maintained through the principle of connectivity—one that increasingly relies on variation and divergence from the existing rather than on recognizability.

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Michael Charlton

Improving Intervention Knowledge through Social Systems Analysis.

Over the past 50-60 years or so a number of commodified management ideas have come into being. Their origins can be traced to management consultants, management gurus and business schools (Heusinkveld, 2014) and some of these ideas have more been successful than others in capturing the imagination of practising managers. One example - a lesser known one for sure - is what might be called the systems thinking approach. Its claim is that it can provide methods to help managers see the situations they are trying to manage as wholes and it facilitates what might loosely be called “bigger picture” thinking. Despite its lack of take-up by managers it continues to expand its range of methods, is vigorously debated in academic circles, and enjoys endorsement by international bodies and the International Center for Complex Project Management (ICCPM) (see Jackson, 2025).

Perhaps surprisingly, the systems thinking approach rarely, if ever, uses second order sociocybernetic ideas and concepts to "mount" (to use Checkland & Scholes' (1990) phrase) a prospective systems study and instead relies on unproblematical questions about who and as consequence what issues will be pertinent to the study.

This article explores how recent work on Luhmann's social systems theory (Luhmann, 2018; Roth et al, 2025) can be used to potentially strengthen intervention strategies for management consultants or others whose role is to provide advice, counsel or insight to organisational clients. It does so by building a framework for the "finding out" stages of interventions based on the systems thinking approach. One test of the framework is that it is consistent with the theory of operationally closed but structurally open systems and takes as given that organisations are constituted communicatively. It therefore observes Luhmann's (1989) distinction between codes and programs.

An attempt to illustrate the framework is made by reinterpreting the findings from an actual systems thinking intervention carried out by the author in a large municipal authority where various would-be projects are jostling for support from politicians and officers. The anointment of would-be projects is a serious matter for those involved as it may contribute to organisation autopoiesis and lead to the establishment of preferred projects. The distinction between determinate and indeterminate work is discussed together with how the latter can sometimes be turned into potential project work and an instrument of political jockeying.

The limitations of the research are then considered, not least Luhmann's suggestion that the consulting industry "ignore[s] the question...of whether the individual organisation is not best able to find out on its own how best to cope" (Luhmann, 2018, p.vii).

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Michal Kaczmarczyk

Observing the Possible Otherwise: Art System's Programs

This paper explores the function of the social system of art within the framework of Niklas Luhmann's systems theory, with a particular focus on the role of its programs. While modern society is characterized by an ever-increasing complexity and contingency, specific social systems develop mechanisms to observe and process this. The paper argues that the art system plays a crucial role through its unique programs, not by reducing contingency, but by making it observable and manageable. Its primary function, viewed through a Luhmannian lens, is the continuous observation of the world through the specific code of beautiful/ugly (or its modern variations), thereby reactivating possibilities excluded by other social systems. This reactivation, guided by art's programs, allows society to "observe more and differently."

Core Thesis

The central thesis of this paper is that the art system enables modern society to perceive, process, and utilize contingency through its specific programs. These programs guide the system's operations (artworks, critiques, exhibitions) and structure how art communicates about the world, specifically focusing on what could be otherwise. I propose that these programs operate on different levels, corresponding to distinct modes of engaging with contingency.

Art's Programs and Self-Programming

Luhmann's concept of programs within the art system points towards a unique characteristic: the "Selbstprogrammierung" (self-programming) of each artwork. Unlike programs in other systems often tied to external goals (like political agendas or economic efficiency), an artwork, once created, generates its own conditions for interpretation and further reference primarily through its form. It introduces a specific difference that demands observation and structures subsequent communication within the art system. My typology builds upon this exceptional nature of art's programs, analyzing how different formal strategies employed by self-programming artworks guide the system's observation towards distinct levels of contingency.

Proposed Typology of Contingency Programs in Art

I propose to identify three distinct levels at which art programs engage with and make contingency observable: 1. Perspective (Shifting Viewpoints). These programs present familiar realities from unfamiliar perspectives, prompting the question: "How is this reality constructed or perceived differently?" Examples include realistic novels emphasizing subjective experience, portraiture revealing hidden facets of a person, or documentary forms challenging dominant narratives by highlighting marginalized voices. This level makes contingency observable by demonstrating that the same reality can be constructed and perceived differently. 2. Possibility (Alternative Sequences). These programs explore how events, histories, or narratives could have unfolded differently. They operate on the question "What if this had happened instead?" This involves constructing alternative plots, counter-factual histories, exploring diverging paths in interactive art, or presenting variations on a theme. Narrative fiction, historical dramas exploring "what ifs," and certain forms of conceptual art exemplify this level. Contingency here is observed as the non-necessity of actualized events and the real possibility of alternative courses. 3. Alternative Reality (Fictional Worlds.: This represents the most radical engagement with contingency. Programs at this level construct entirely fictional worlds governed by their own internal logic and rules, often standing in stark contrast to the perceived reality outside the artwork. They ask "What if the fundamental rules were different?". Science fiction creating new physical laws, fantasy literature building elaborate magical systems, surrealism juxtaposing incongruous elements to create dream-like states, and dystopian narratives presenting alternative social structures are prime examples.
These programs allow society to question its own fundamental self-descriptions and taken-for-granted assumptions by confronting it with radically different, yet internally coherent, possibilities. Modern art, particularly movements like Surrealism and the proliferation of dystopian genres, heavily utilizes programs operating at this level.

Conclusion

By employing these diverse programs, initiated through the self-programming capacity of artworks, the art system continuously tests the boundaries of the possible and the imaginable. It doesn't offer concrete solutions like politics or the economy, nor verifiable truths like science. Instead, it trains society's capacity to deal with the unexpected, the different, and the potential. It keeps the sense of contingency alive, preventing societal self-descriptions from becoming overly rigid. Furthermore, these levels of contingency management

resonate with different social scales. The first form, perspective shifting, primarily supports intersubjectivity within interaction systems. The second form, exploring alternative possibilities, aids society in coping with functional differentiation.
Finally, the third form, constructing alternative realities, allows society as a whole to confront its environment.
Crucially, this typology operationalizes Luhmann's concept of art as second-order observation. The first level observes how reality is constructed differently. The second level observes how sequences could be constructed differently; and the third level observes how the very rules of observation could be different. The "self-programming" nature of artworks, guiding their reception, further facilitates third-order observations within the system's communication (observing how art observes). Through its programs—from shifting perspectives that bolster interaction, to exploring possibilities that aid navigation in a complex society, to building alternative worlds that allow society to reflect on its fundamental structures and environment—art fulfills its unique function. It allows society to observe itself and its environment with an enhanced awareness of contingency at multiple levels, thereby fostering reflexivity and adaptability in the face of an inherently uncertain future. This paper argues that recognizing this programmatic differentiation, operating primarily through second-order observation, and its multi-level social resonance, offers a key for understanding the specific contribution of the art system to social reflexivity within Luhmann's theoretical framework.

Mogens Grosen Nielsen

Making Programs Work: Applying Luhmann's Social Systems Theory to Quality Management and AI in Statistical Organizations

This paper explores how statistical organizations can use programs such as quality frameworks, planning documents, and operational guidelines-as practical tools for managing complexity and improving quality, especially when these programs are supported by AI. Drawing on Niklas Luhmann's social systems theory, the paper focuses on how programs do more than set rules: they help organizations observe themselves, coordinate decisions, and adapt to changing environments.

The dominant theories often view organizations through actions or actors, focusing on individual decision-makers and goal-directed behaviour. In contrast, Luhmann's theory sees organizations as autopoietic systems, consisting of decisions as communications. These systems absorb uncertainty by transforming it into subsequent decisions. Decision premises—programmes, personnel, and communication channels—guide and constrain decisions, allowing organizations to reproduce themselves. Programmes act as second-order observations, absorbing uncertainty, reflecting the system-environment relationship, and structuring the organization's self-observation. This stabilizes expectations and guides future decisions, maintaining organizational autopoiesis.

Traditional approaches often see programs as checklists or static procedures, and AI is typically used to automate routine tasks. However, this perspective misses the potential for programs to guide communication and for AI to enhance how organizations use these programs in practice. In Luhmann's terms, programs act as second-order observers. They help organizations reflect on their own processes, identify where things are working or failing, and adjust accordingly.

A main aspect is on managing conflicts and coordination within organizations operating in a functionally differentiated society. Both organizations and their subunits rely on distinct codes such as power (management), money (finance), law (compliance), media (communication), and science (methods) to reduce complexity and assert their priorities. These codes often compete, and can be turned into "discourse weapons" during organizational decision-making. They influence and are being influenced by decision on technical implementation of information system including AI. This involves choice of knowledge and algorithms in AI system, who has access, who finance and who operates the AI

systems. Rather than relying on direct hierarchical steering, Luhmann's theory suggests that organizations should use programs such as quality framework etc planning documents etc as structured arenas where different codes are negotiated and compromises are facilitated.
This paper addresses three research questions:

1. *How can programs help statistical organizations reflect on and improve their own work?*
2. *How can organizations manage conflicts and coordinate between different departments when each follows its own set of rules or priorities?*
3. *How can AI be designed to support these programs, not just by automating tasks, but by helping organizations use programs actively as knowledge in AI applications?*

The analysis shows that statistical organizations can move beyond rigid hierarchies toward communication-based management. This approach positions programs as central mediators in organizational self-observation and coordination, enabling effective handling of complexity in environments. The paper will include two examples showing the use programs for managing complexity. One about how to transform a Generic Activity Model for Statistical Organisations into a generic model focusing on programs for managing complexity. One about how AI can be used to integrated as part of this this process.

Mohamed Ben Achour

Towards a Computational Turn in Luhmann's Systems Theory

This communication proposes a computational reformulation of Niklas Luhmann's systems theory, grounded in the hypothesis that autopoietic social systems can be rendered intelligible through algorithmic iteration. We ask: what becomes of social theory when the foundational operations of a system—differentiation, autopoiesis, structural coupling, temporal recursion of social communication—are no longer only described, but executed recursively through a formalized process?

Rather than adopting systems theory as a conceptual vocabulary applied to empirical sociology or legal theory, words printed on paper, this intervention treats Luhmann's theory as a formal language—translatable to Python, capable of expressing itself computationally. From this perspective, functional differentiation is no longer only observed; it is instantiated. Social systems (e.g., law, politics) are modeled as distinct agents, each operating according to their own binary codes (valid/invalid, legal/illegal, constitutional/unconstitutional). These agents interact through structurally coupled procedures that preserve operational closure while enabling systemic evolution.

At the center of the theoretical model lies a minimal recursive logic: a political system generates norms; a legal system validates them and produces decisions; recursive feedback shapes subsequent iterations. A political system generates laws; a legal system validates them and produces decisions; recursive feedback shapes subsequent iterations. The simulation explores the generativity of Luhmannian concepts under conditions of computational formalization. It is a test of form: can the dynamics described in Soziale Systeme or Das Recht der Gesellschaft be recursively unfolded in code without losing their theoretical integrity?

As a case study, we simulate a society differentiated between law and politics. Political operations introduce norms into the system; legal operations filter, accept, or reject them based on internal criteria. Over time, patterns of validation and rejection, delays between creation and adjudication, and pressures from environmental conditions (simulated stochastically) produce emergent indicators such as "normative saturation," "institutional lag," or "constitutional drift." These are not empirical measures but second-order observations—traces of systemic self-description under formal recursion. This approach does not aim to replace traditional sociological observation. Rather, it offers a parallel epistemology: one that operates not through representation but simulation. We simulate not society itself, but the form of

society as a recursive procedure. In doing so, we ask whether systems theory, in its computational turn, might not only describe the operations of society but become one of them.

Morten Knudsen

Problem finding in functionalism

This paper contributes to the discussion on how to develop research problems that enable researchers to surprise themselves. It does so by presenting a functionalistic way of using problems and solutions analytically. I focus on a specific aspect of functionalism: Luhmann's functional methodology. This methodology addresses the challenge of generating promising research problems - that is, research problems that surprise researchers - but does not restrict this process to an empirical or theoretical quest. Rather, it compels researchers to develop research problems through an interplay of theory and the phenomenon under study. The paper examines how this works and discusses whether functional method can be combined with different theoretical traditions. The paper concludes by suggesting five functional methodological rules of thumb.

Nico Buitendag

Sea-Level Rise and Territoriality: Between Luhmann and Schmitt

What happens to a recognised state when it loses its landmass to the extent that it no longer fulfils the territorial requirement of sovereignty? The threat of complete submergence of some Small Island Developing States (SIDS) because of sea-level rise has been taken up by the United Nations's International Law Commission. This study subjects their reports to a critical intertextual analysis with the theoretical work of Carl Schmitt, Niklas Luhmann and Zygmunt Bauman, focusing on the axes of space, politics and law. Developing on Schmitt's idea of land-appropriation and coining the concept of "thermodynamic appropriation", it is claimed that sea-level rise comprises a spatial re-ordering that necessitates a legal re-ordering, and two broad possibilities are outlined. It is argued that whether a terracentric Schmittian or a liquid, oceanic Bauman-Luhmannian approach to sovereignty is followed, the doctrine can impossibly remain as it stands.

Nicolas Hayoz

Organising and controlling society against modernity. The case of Russia

Autocratic regimes and, nowadays, illiberal populist parties and governments question certain achievements of modern society and attempt to control them, such as the autonomy of science (universities), politics (parties), the economy (companies) or the law (judiciary). When we ask how such regimes seek to achieve this control, we can draw on two distinctions made by Niklas Luhmann, namely the distinction between society and organisation on the one hand, and the distinction between code and programmes on the other. It is obvious that in modern global society there are many regional variants that do not accept the type of modern society we have in mind, with its freedoms and achievements. States, particularly autocratic ones, use organizational power to control other organizations such as political parties, companies, universities, NGOs etc. or to control the flow of persons and products into their own territory.

The extent of such a control of organizations by organizations is of course a matter for empirical observation. But it is probably safe to conclude that specific political organizations can be catalysts of the "local" performance of functional systems as well as obstacles to them. Such a mobilisation of organizational systems could suggest that society, even a "regional society" can be organized. But as we know organizations are not society. As Luhmann has underlined it many times: Organizations need society and they serve specific social functions, but they do not coincide with them.

What can be seen here is that organizations not only realise society. Particularly autocratic state organizations try to "undermine" functional differentiation for example through corruption, patrimonialism, personal power networks, the politicisation of law, economy or science and nowadays also by militarization, as the case of Russia shows. Does that mean that functional differentiation could be threatened on a regional level, by the very products of functional differentiation? Or could we say that autocratic regimes such as China or Russia could be even considered as alternative to functional differentiation. But standing against the "West" is not an argument for placing such countries in the 'tradition' of a different modernity. On the contrary, it is clear that such power structures parasitise functional differentiation. As parasites of modern society, they seek to profit from the global economy while keeping those areas of society under control that could threaten their power,

e.g. political movements, universities, an independent judiciary or civil society.
The second distinction code and programme must be brought into play here: it is the distinction between the structural level of the operation of functional codes in politics, the economy, the education system, law or science on the one hand, and the level of the programs of these functions systems on the other. It is on this programmatic level, which can also be presented as the level of performance of social systems, where the idea of "undermining" functional differentiation would make sense. It is here where state organizations can try to control "their" regional society, develop new "competitive advantages" by politically forcing investments in specific economic sectors. It is also here where they run into debt or even bankruptcy or where they can try to control, restrict or even oppress specific activities of their citizens or other organizations in the political system or in other functional systems, for example in courts, research organizations, schools, companies, churches, associations etc. So states, particularly autocratic ones, may instrumentalise functional differentiation for political ends. They may present themselves as "organized societies" and in extreme cases as societies to be "revolutionized" under the guidance of a single party-organization. The functional differences of world society are not "touched" or questioned by regional political experiments which may also include the power to push whole countries towards economic ruin or as we can see right now in the case of Russia to destroy the infrastructure of a neighbouring country, Ukraine, through war. On the other hand, in an oppressive organised society such as Russia, modern society presents itself in a distorted version. Everything is there: judges, politicians, entrepreneurs, scientists, teachers, artists, etc., but obviously political programmes, laws and informal structures are so restrictive that the areas these professions represent function poorly or are becoming increasingly marginalised and isolated. The perverse effects of such structures are well known. Think, for example, of emigration abroad or 'inward'. Consider the militarisation of society, which the regime is promoting with its absurd ideological programmes and propaganda instruments. One could also say that this is about anti-modern developments within modern world society. This paper examines these developments primarily in Russia and aims to demonstrate the added value of Luhmann's distinctions for the analysis of politically organised autocracies. The paper examines how different areas of society in Russia (one could also take other dictatorships as examples) such as education, science, the economy, law and also politics itself are instrumentalised, neutralised and in part also colonised by a regime that is characterised by the preservation of power and imperialist expansion of power. We see a politically 'organised society' at work here, which, with its repressive

organisations and programmes, practices exclusion for the people and inclusion for the loyal and obedient supporters of the regime and thus also blocks political and social change.

Philipp Belcredi and Tilia Stingl de Vasconcelos Guedes

Adapting Teams to New Realities: Purposive Programs, Generative AI, and Distinction-Based Task Performance

This conceptual paper aims to establish a systems-theoretical framework for rethinking strategic approaches in light of the profound transformation the workplace is undergoing through the rise of Generative AI (GenAI). It draws on insights from a broader research project focused on developing evidence-based strategies for integrating GenAI into the educational institutions of the Vienna Chamber of Commerce and Industry (WKW). The motivation for this conceptual work stems in particular from an experimental component of the project, in which student teams were tasked with solving complex problems under varying conditions: some groups worked exclusively with GenAI tools, others without. The aim was to examine how GenAI impacts the development of competencies and how team dynamics influence task outcomes. Findings show that team quality plays a decisive role in performance, with high-functioning teams using GenAI producing more creative and professional results. These results form the basis for the paper's central argument: that purposive programming, grounded in systems theory, can offer valuable strategic orientation for enhancing team dynamics and fostering effective human–AI collaboration in both educational and professional settings.

Rafael Quintero Godinez

The Autopoietic Logic of Global Investment Law

This presentation pertains to the first chapter of my book on *The Autopoietic Logic of Global Investment Law*. The book examines the investment arbitration (ISDS) system as a self-referential, autopoietic programme within the legal subsystem, aligning directly with the conference's focus on programmes as guiding structures. Using systems theory (Luhmann and Teubner), it analyses how this programme maintains its core logic of capital protection (its 'software') despite external challenges, shaping societal dynamics by constraining democracy. The first chapter, undertakes an archaeological excavation of this programme's autopoietic evolution, tracing its 'genetic code' from the hybrid violence of 18th-century claims commissions to its achievement of operational closure as a modern legal caste system.

Richard Pretorius

The loudest voice in a room: Lindbeck, legitimacy and interpretive asymmetry in Luhmannian systems theory

Niklas Luhmann's modern society is characterized by its communication belonging to an array of functionally differentiated subsystems. As argued for by Kneer (2001), Knudsen (2007), Sales et al. (2022), and others, organizations participate with society's functionally differentiated subsystems when making decisions. Furthermore, as argued for by Pretorius et al. (2024), these functionally differentiated subsystems are structurally coupled with one another through their participation with other societal systems like innovation systems (Roth et al., 2020), planning systems (Van Assche, 2007; van Assche & Verschraegen, 2008) or organizational ecosystems. In these settings, throughout the decision making process, organizations must balance the competing logics that each of the differentiated systems they are structurally coupled with manifests. But the question of how systems balance competing logics when they need to organize is not a straightforward one to answer – and is particularly pertinent in settings where coordination between systems is necessary, as one may find in an ecosystem.

Social systems—such as law, politics, and science—and indeed organizations, are self-referential systems that form themselves as they produce their meaning (Luhmann, 1995, pp. 60–62). Each of these systems is operationally closed, processing environmental inputs in terms of its own code and internal logic as the manifestation of its meaning (Luhmann, 1995, pp. 37–38). Systems form environments for one another, and all systems interpret themselves, their environment, and those systems comprising of their environment through their individual meaning making processes (Luhmann, 1995, p. 48). As a result, systemic differentiation makes direct translation between systems inherently problematic as each system's meaning differs. Luhmann addresses this through the concept of generalized media (such as truth, money, or power), which facilitate structural coupling across systems (Luhmann, 2002, p. 85). However, even with these mediating mechanisms, interpretation across systems cannot be based on shared cognitive content; rather, it relies on the compatibility of internal structures (Luhmann, 2002, pp. 90–93).

In the context of ecosystems, distinct organizations can cooperate with one another but will still each have their own goals and meaning making systems. How, then, do these systems interpret one another when direct translation between systems is not possible and no shared cognitive framework exists? And

can one system have greater influence to generate competitive advantage in such a scenario?

To address this topic, this paper draws on George Lindbeck's cultural-linguistic theory of interpretation between systems of belief that offers an interpretive supplement. Rejecting both propositionalist and expressivist models of truth, Lindbeck (2009) argues that beliefs function like a language: meaning emerges from the consistency of use within a community's rule-bound grammar. Applied to Luhmannian systems theory, this suggests that communication between systems is more akin to interpretation between distinct language games than to logical inference. What matters, then, is not the truth of a claim in absolute terms, but the coherence of that claim within its originating system and its intelligibility to another system's process of interpretation. For Luhmann, systems relate to their environment and one another through their meaning, using their meaning to interpret irritations produced by those systems they are structurally coupled with. Those systems that can consistently reproduce their operations according to their code and programme are perceived as more legitimate both internally and externally (Luhmann, 1983, p. 167), thus making legitimacy a function of internal consistency and boundary integrity (Pretorius et al., 2024). Systems that differentiate themselves from their environments in a way that coheres more with their past and future meaning are more stable and thus more legitimate (Luhmann, 1995, p. 347). As a result, systems that are better equipped to interpret environmental irritations in a way that is more consistent with their past or future meaning will have greater legitimacy as they maintain a clearer and more consistent distinction between themselves and their environment.

By contrast, systems with weaker internal coherence struggle to interpret environmental complexity without compromising their code. They may borrow programmes from other systems, struggle to react to environmental changes, or exhibit contradictions within their own operations. These vulnerabilities undermine their legitimacy, blurring system boundaries and reducing operational stability (Luhmann, 1981, p. 23). This paper argues that from a Luhmannian standpoint, such systems become over-coupled—too dependent on inputs they cannot filter—and thus increasingly shaped by the operations of more legitimate and coherent systems in their environment. Incorporating Lindbeck's cultural-linguistic perspective into Luhmann's meaning-driven interpretation produces a dynamic that has clear implications for organizations navigating plural social environments like ecosystems. Organizations engaging with multiple societal subsystems while simultaneously coordinating with other organizations as they participate in an ecosystem will evaluate one another from the perspective of legitimacy – or, how consistently they can manifest their meaning. Their legitimacy, in this

context, depends on their ability to maintain internal coherence across these couplings while preserving a stable identity. Thus, legitimacy is not just strategic adaptation, but a matter of organizational intelligibility—how well the organization can interpret and be interpreted within the linguistic frameworks of the systems it engages with.

Understanding the dynamics of legitimation and interpretation from this perspective elucidates an asymmetrical loop of irritation and adaptation. This paper argues that more legitimate systems—those with strong internal coherence and clear systemic boundaries—are able to irritate their environment more effectively. They do so not by intentionally asserting dominance, but simply by maintaining consistency in their own operations. Conversely, less legitimate systems lacking the required internal resources for stable reproduction must adjust more frequently and with less interpretive control. This intensifies their dependence on the more legitimate systems that shape their environment, further undermining their own legitimacy. Over time, such asymmetries produce feedback loops in which more legitimate systems consolidate their legitimacy while less legitimate systems become increasingly reactive. Over time, this means that organizations can achieve greater systemic resonance among ecosystem participants by focusing on strengthening their own internal coherence. In this way, legitimation through coherence is a strategic asset that allows organizations to shape rather than be shaped by their environment.

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Simen Mørstad Johansen and Truls Tunby Kristiansen

Conceptual obstacles and their methodological and ethical implications in research on family and the welfare state: a systems theoretical perspective

This article investigates how concepts such as "family," "welfare state," and "child protection and welfare" are used in social science research, and how implicit ontological and normative assumptions embedded in these concepts produce epistemological and ethical challenges. Building on Luhmannian systems theory and methodological constructivism (Hagen, 2016), we argue that the dominant, often un-reflected conceptual framings within family and welfare research contribute to epistemological obstacles that limit what can be observed empirically and risk reproducing normative assumptions under the guise of analytical clarity.

Our point of departure is a series of analytical tensions experienced in research on welfare institutions and families, where central concepts are frequently drawn from political or everyday usage without clear theoretical specification. In response, we propose a system-theoretical reconstruction of these concepts, particularly through the distinction between functional systems and organisations and the distinction between inclusion and exclusion. By analysing three influential research texts from the fields of family sociology, child protection, and welfare policy, we demonstrate how conventional uses of "institution," "system," or "service" often conflate different levels of abstraction—obscuring empirical boundaries, hindering/reducing analytical precision and reinforcing hegemonic definitions of family and welfare.

We build on previous system-theoretical work on concept development and theorize how conventional welfare-state research has inherited an institutional ontology that confuses normative ideals, abstract social functions, and concrete organisations. In this context, we discuss how systems theory's distinctions between organisation, function system, and inclusion/exclusion of individuals(?) offer a more fruitful conceptual apparatus. For example, we conceptualise concrete families and public welfare agencies as multifunctional organisations, structurally coupled with a multitude of functional systems (Aamodt, 2018, Roth, 2014). Moreover, building on previous system-theoretical work on the family and love (Luhmann, 1986; 1990, 2012) on one side and social work and welfare (Nissen, 2010, Schirmer and Michailakis, 2019) on the other side we propose a redescription of two functions systems: love and welfare (Roth & Schütz, 2015). On the one side we propose that love can be characterized as a function system that families are expected to connect to, and

we propose that welfare is a function system concerned with primary and secondary inclusion and exclusion, of which social work is a subsystem. Thereafter we describe how these two function systems are structurally coupled through families, child protection and welfare organisations.
This framework may facilitate new insights into how state concerns for families are translated into organisational practices and how these, in turn, interact with intimate expectations. We conclude that systems theory not only helps overcome epistemological obstacles typical of conventional social-scientific observation but also entails an ethical imperative: to maintain a reflexive distinction between analytical and normative claims. This, we argue, is crucial for producing transparent and accountable knowledge in contexts where research both informs and is shaped by welfare-state practices. Our chapter contributes to the growing literature that applies Luhmannian insights to the study of welfare, family, and child protection, advancing it by offering a refined conceptual grammar for observing inclusion, exclusion, and concern in modern welfare societies.

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Soonyawl Park

Indirect Steering Without Unity? The Gadeokdo Airport Project as Parallel-Structure

The construction of the Gadeokdo New Airport in South Korea provides a compelling case study for analyzing the dynamics of large-scale infrastructure projects within a functionally differentiated society, particularly through the lens of Niklas Luhmann's social systems theory. This paper argues for a reconceptualization of infrastructure—not as a foundational "infra-structure" that underpins a unified social whole, but as a "parallel-structure" that reflects the coexistence of multiple autonomous systems. This parallel-structure necessitates forms of indirect steering that recognize the autonomy of individual systems rather than seeking unified control. Luhmann's theory posits that modern society comprises functionally differentiated systems—such as politics, economy, law, science, and environmental activism—each operating according to its own binary code and evolving internal programs. The Gadeokdo project exemplifies structural coupling among these systems, where intersystemic interfaces generate mutual irritations rather than coherent integration. These frictions resist resolution through appeals to singular social interests or overarching value consensus.

Within such a polycontextural society, each system reproduces itself through operations coded by its own logic (e.g., legal/illegal, profitable/unprofitable, true/false) and is guided by programs that evolve in response to both internal and external complexities. Infrastructure, from this perspective, is not a neutral backdrop for social activity but a dense interface where systems collide, irritate one another, and recalibrate their operations. The Gadeokdo case illuminates these dynamics: the project is framed politically as a matter of national urgency, positioned economically as a regional growth engine, contested legally over procedural legitimacy, and opposed environmentally due to threats to marine ecosystems. Scientific assessments oscillate between the imperatives of technical optimization and ecological precaution, while civil society actors articulate alternative values rooted in sustainability and intergenerational justice.

Informed by critiques from science and technology studies (STS) and anthropology, this paper emphasizes that infrastructure is not merely technical but deeply socio-material, historically contingent, and politically charged. Scholars have shown how large-scale infrastructure projects often entrench inequality, obscure labor, degrade ecosystems, and reconfigure socio-political power. The Gadeokdo case echoes these critiques but reframes them through

the lens of systems theory: the contestations surrounding the project are not merely external objections to a unified development scheme but systemic irritations that compel each participating system to reconsider its guiding distinctions and internal coherence.

This analysis builds on Luhmann's concepts of polycontexturality and evolving programs to interpret the airport project not as a site of consensus or convergence, but as one of ongoing differentiation. For instance, the economic system increasingly integrates sustainability alongside growth metrics; the political system navigates tensions between electoral imperatives and procedural credibility; the legal system wrestles with balancing formal compliance and environmental equity; and scientific communities revise evidentiary thresholds in response to ecological uncertainty. These shifts do not resolve into a unified vision but instead signal continued specialization and divergence among systems.

Crucially, such frictions give rise to emergent "third values"—unstable orientations that unsettle existing binary codes and destabilize internal programmatic logics. These values are not the result of consensus but are symptomatic of turbulence at the interstices of system couplings. Infrastructure projects like Gadeokdo thus become crucibles in which new operational norms, decision-making logics, and imaginaries of the future are experimentally enacted—often without reaching stable closure.

The paper concludes by cautioning against attempts to resolve infrastructural conflict through outdated integrative or hierarchical governance models, which risk de-differentiation or the corruption of system-specific autonomy. Instead, it advocates for modes of indirect steering attuned to polycontexturality and the logic of parallel-structure. Recognizing infrastructure as a volatile site of systemic interaction and transformation is essential to understanding how legitimacy, complexity, and value evolution unfold in contemporary infrastructural interventions.

Sören Möller

Pseudo-individual predictions as interventional health programs. Shattering the individual into data points

In many areas of society, including health care, automatic prediction models are increasingly common, with the aim of forecasting individual citizens' future attributes. While until recently most of these predictions have been utilized in a one-to-one setting, e.g. as part of a diagnostic consultation with a medical doctor, now such predictions are frequently implemented in population level systems, such as screening programs and public health surveillance measures.

Implicitly this changes the assumptions behind such models, as while a model used in a one-to-one setting only must be evaluated with respect to its ability to perform well on the current individual, and different prediction models can be used for different individuals, a population level model preferably has to work well on all individuals in the population it is applied to.

This assumption is disregarded in many public health program settings, at least in their communication to the public as well as to decision makers, making believe that models will work on all individuals in the target population. This mismatch between model properties and presentation carries substantial risks both for health and self-determination of the individuals, as invalid predictions can pressure them to accept interventions and procedures, contrary to their desires and individual health needs.

In this presentation I will discuss this mismatch between population level predictive programs and individual level gains (or lack thereof). In this process I will describe both the mathematical background behind this phenomenon, projecting a heterogenous mixture of characteristics and prognoses onto a homogenous, but ill-fitting, aggregate. Moreover, I will investigate the related issue of defining relevant data by availability instead of subject matter knowledge, thereby including misleading available predictors, causing biases, while ignoring important relevant but unavailable predictors, forcibly homogenizing the populus.

I will exemplify these structures with cases from heath care as well as society at large. These examples will include good as well as bad experiences from health (osteoporosis, cancers and hepatitis) screening programs in the Nordics, as well as economic examples, including health service planning and property taxation in Denmark.

In conclusion these theoretical considerations and practical cases will demonstrate, that while prediction models can be highly useful on an

individual basis, their application on a population level, at least in the currently common manners, carries large risks for the individuals involuntary included in those populations.

Tanja Lindacher

Inclusive education as an interventional programme in education. How can the research findings be located in terms of systems theory?

Among the thematic areas identified in the call for papers, this contribution refers to the latter point of 'Interventional programmes in, among others, politics, health, or education'. It addresses inclusive education as an interventional programme in the education system insofar as it may lead to a change in the various programmes in the education system. It is based on the central premise that in today's functionally differentiated societies, social events can neither be exclusively assigned to one social subsystem nor are they exclusively processed communicatively by one system. For the object of analysis of inclusive education selected here, this means that as a "social event it may simultaneously be economised, politicised and mediatised" (Roth & Schütz, 2015, p. 16) – and, should be added, also pedagogised (that means, presented in an educational form) and scientified, etc., whereby incommensurability must be assumed across all functional systems (cf. Roth & Schütz, 2015, p. 17). It will be therefore first necessary to justify why the object of analysis of inclusive education is to become a topic at all with reference to selected functional systems - here in this article education and science. In national and international inclusion research, inclusive education is negotiated as a global paradigm that focuses on processes of inclusion and exclusion in educational contexts and aims to identify barriers to participation in education systems and to work towards their removal (cf. Richardson & Powell, 2011). Inclusive education serves a range of criteria for educational practice, from supporting individuals in individualised lessons to creating communities that take into account the individual needs of as many people as possible. In this context, it is seen as an important step on the way to a society that considers itself as being inclusive (cf. Magnússon, Göransson & Lindqvist, 2019, p. 71). It can be assumed that the programmatic activities of the education system are challenged in a special way by the decree and implementation of inclusive education. From a systems theory perspective, however, inclusive education is not simply "transferred" from politics to education, but generates an irritation within the education system, e.g. because special schools functioning as separate school types are closed and pupils are programmatically 'distributed' differently than before.
For science as a social system, inclusive education is primarily relevant as a subject of research. Here, programmes are used in the form of theories and

methods, on the basis of which scientific communication, e.g. about research results, is to be initiated. Although the programmes provide orientation with regard to the verification of knowledge (cf. Roth & Schütz, 2015), they do by no means extend to a uniform understanding of 'theory'. According to Abend (2008), several different meanings of 'theory' can be identified in the discipline of sociology alone.

Against this background, the article explores the question of how the programmatic activities of the education system are negotiated in the scientific system in view of the implementation of inclusive education. In other words, the first step is to take stock of the state of research on the implementation of inclusive education as an interventional programme in the education system from an explicitly system-theoretical perspective. Specifically, against the backdrop of a system-theoretical analytical framework, it will be examined how the subject of inclusive education is analysed in research.

Methodologically, such an approach is based on a second-order observation, with the scientific system acting as a second-order observer (cf. Luhmann, 2018). The decision in favour of an observer perspective informed by systems theory is accompanied by distinctions regarding the specific nature of the subject matter.

So far, the following thematic approaches have been identified in explicitly system-theoretically informed perspectives on inclusive education: e.g. various forms of communication in social systems as the pivotal point of continuously occurring processes of inclusion and exclusion (cf. Emmerich & Hormel, 2021), self- and other-referential expectations of inclusive teaching in the conceptualisation of pedagogical communication of the education system, inclusion and exclusion as meta-concepts for describing process complexity at the levels of analysis of society, organisation and interaction (cf. Qvortrup & Qvortrup, 2018), inclusion as an opportunity for the education system to subject its self-observation technologies to change at an organisational level on the basis of new distinctions and thus to dynamically stabilise its communication, functional differentiation as a conceptual approach to analysing the complex structure of (special) education organisations, professions and the academic discipline of special education (cf. Wermke, 2024) and the semantics of inclusion as a self-description of the education system with the option of regaining (lost) autonomy in the course of strengthening its competence. These approaches and some more are to be transferred into a systematised form in the course of the preparation of the conference contribution.

In a second step, additional research findings on the implementation of inclusive education from other research paradigms are taken up and located in terms of systems theory, e.g. findings on the question of which support services

are provided to schools as organisations by the so-called 'pedagogical establishment'. Using the two support systems 'school networks' (cf. Armstrong, 2015) and 'school inspection' (cf. Hofer, Holzberger & Reiss, 2020) as examples, the extent to which they are able to advance the programmatic activities of the school organisation will be discussed.
The aim of the paper is to develop a system-theoretical heuristic for the localisation of research findings regarding the implementation of inclusive education as an interventional programme in education.

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Vibeke Klitgaard

Programmes and Codes in Psychiatry and Psychosocial Disorders Respectively and the Open Dialogue Approach

My guiding codes in this presentation will be sick-healthy code of the medical function system, including the subsystem of psychiatry, versus the meaning-disordered/meaningful code of psychosocial disorders.
The empirical material is 30 years old, I worked for four years in an evaluation project on community psychiatry in the Municipality of Copenhagen (Knudsen et al., 1992). I observed the daily life of the patients in two community daycare centers. I was the only sociologist in the team, the other five members were trained medical doctors, three psychiatrists and two specialists in social medicine. I observed plenty of "psychiatria major" phenomena, i.e. meaning-disordered speech and behavior. These phenomena stay the same phenomenologically speaking, as they still present themselves as psychotics with or without hallucinations, massive delusions, paranoid self-referential delusions, non-stop talking bursts etc. New textbooks in psychiatry describe the same phenomena, that I observed (Cullberg, 2004; Bock, 2010; Crafoord, 1994; Hausgjerd, 1990; Mors, et al. (red.), 2017; Poulsen (red.), 2010; Ruf, 2005; 2013; Simonsen & Møhl (red.), 2010; 2017). When they are psychotic the patients talk and behave straight out of their private imaginary world. The symbolic content of these phenomena changes slowly with societal changes, but they remain "psychiatria major" phenomena (Scull, 2006; 2015). Psychotic patients are beyond reflective perception and reflective expectations (Luhmann, 1971; 1984; 2002a), and as such they cannot communicate in a comprehensible way or behave inconspicuously in normal everyday life. Traditional psychiatry systematically copies the somatic treatment methods: It talks about the patients; in most psychiatric institutions psychoactive medications are supposed to treat "symptoms" – as if they were void of meaning. The said medications can have somatic effects, which can contribute to the stigmatization of the patients. In most psychiatric institutions, patients are coerced to accept psychoactive medication or to leave. The body cannot produce meaning, whereas the psychic system like the social systems functions in the medium of meaning. In the psychiatric subsystem spoken communication is the main activity of psychiatry (Klitgaard, 2021; 2025). Psychosocial disorders/"mental illness" have the same three-part-structure as somatic diseases: The involuntary, the function reduction and the suffering, but they all take place in the medium of meaning, where somatic diseases originate from the body.

The involuntary element can be seen sociologically as a deviation, but the patient cannot be held accountable for it (Parsons, 1951). The function reduction in the medium of meaning manifests itself in loss of meaning in communicative and behavioral skills. The content of psychosocial suffering take place in the medium of meaning in the form of auditory and visual hallucinations, massive delusions, etc. All of these phenomena negatively affect psychiatric patients. In general, the severely psychosocially disordered cannot answer any "why" questions in a way that makes sense to their social environment, i.e. that they are meaning- disordered.
"Open Dialogue" (O.D.) originated in Western Lapland in Finland in the mid-1980'ies. It is a network- based approach which can consist of various groups of professionals (from inside and outside the psychiatric wards), family members and sometimes close friends and neighbors. In O.D you speak with the patients, mainly in their own homes, the network meetings can include 8 to 15 participants or more.
The guiding principle is early intervention, normally at the first crisis of a patient. Its main principle is let all voices be heard – even the "voices" of the patient, although participants can ask the voice-hearer about the meaning and significance of her voices. Another guiding principle is tolerance of uncertainty, as professionals are often solution-oriented, but in this context, it is best to let the family work out solutions by themselves. The results of O.D. are about double as good as those of traditional psychiatry: reducing the incidence of hospitalization, the rate of recidivism and use of medications (Seikkula, 2008; 2024; Seikkula & Arnkil, 2007; 2014). The main reason for these results would probably be, that O.D. almost entirely works in the media of meaning.
In epigenetics, the discipline studying the interaction between inheritance and environment, results point out that it has become impossible to clearly distinguish between biological, biochemical and social factors (Schutt, Seidman & Keshavan (eds.), 2015).

Vincent Lien

Constructing a Systems Theoretical Architecture: From Grammatical Differentiation to Educational Formation

This paper presents a theoretical framework that I have developed as an analytical tool. The following pages outline and explain the conceptual logic that underpins the construction of my theoretical framework. Inspired by Steffen Roth's (2025) "The Matrix Reloaded", the methodology for developing my framework is grounded in a formal matrix-building strategy, one that draws not from semantic analogies but from grammatical differentiation and systemic theory. Through the purposeful reconfiguration of the concepts of experience and action across grammatical categories – noun, verb, and adjective – this chapter contains three sections. The first section explains how the fourfold matrix that guides this dissertation was constructed. Then, this matrix is mapped onto the historical development of the philosophical traditions of experience-based and action-based education, allocating them in the most relevant cell blocks. Finally, the generative capacity of this theoretical framework is demonstrated through the process of re-entry into the psychic and social systems distinction to introduce the autoethnographic case study methodology of this dissertation.

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Vladislav Valentinov

Transactions and relationships in stakeholder theory: A Luhmannian perspective

A defining feature of stakeholder theory is its insistence that stakeholder relationships transcend mere economic transactions (Valentinov & Roth, 2024; Kujala et al., 2022; Jones et al., 2018; Bridoux & Stoelhorst, 2016; Buchholz & Rosenthal, 2005). Freeman et al. (2020a, p. 225) argue that while the "economic transaction" is the most common unit of analysis in business, the "stakeholder relationship" is the more illuminating, underscoring that stakeholder relationships cannot be reduced to an aggregation of transactions. At its core, stakeholder theory frames business as "a set of value-creating relationships" (Phillips et al., 2019, p. 3) and is rooted in a relational worldview grounded in pragmatist philosophy (Godfrey & Lewis, 2019; Valentinov & Chia, 2022). This worldview distinguishes transactions—discrete, measurable exchanges focused on economic efficiency—from relationships, which involve ongoing, multidimensional engagements characterized by fairness, trust, respect, and shared objectives.

Although this relational narrative is well-established and widely accepted among stakeholder scholars, it may obscure an alternative interpretation of transactions: one in which transactions are viewed not merely as discrete exchanges but as markers of the economic identity of unfolding events. In this sense, transactions become the defining units of economic activity, an understanding that aligns with Niklas Luhmann's social systems theory (cf. Luhmann, 2012; 1994). According to Luhmann, modern society comprises distinct function systems, including politics, law, science, and—of particular relevance here—the economy. Within the economic function system, transactions are the foundational occurrences, the sine qua non for describing economic phenomena. This perspective extends even beyond sociology, resonating with institutional economics, where foundational figures such as Oliver Williamson (e.g., Williamson, 1975; 1985; 1996) and John Commons (e.g., Commons, 2005) similarly regarded transactions as the essential analytical unit for understanding economic life.

Drawing inspiration from Luhmann's systems theory, we advance a new conceptual understanding of transactions and relationships. Our conceptual framework adopts the Luhmannian understanding of transactions as elemental events constituting the economic function system in modern society. It is through transactions that large-scale economic coordination occurs, whether mediated by markets, hierarchies, or hybrid governance

structures. However, transactions are not self-sustaining. They are inherently precarious, relying on external support to operate smoothly. This support comes from stakeholder relationships, which provide the legitimacy needed to sustain transactions within the broader societal environment of the economic function system and individual corporations. In this light, transactions and relationships are not oppositional forces but complementary components of value creation.

Our argument not only enhances the pro-business and pro-capitalistic credibility of stakeholder theory but also sheds light on the conditions under which stakeholder collaboration in business is most likely to succeed. A key condition is the awareness and mitigation of the risks associated with dysfunctional stakeholder relationships. Favoritism, relational lock-in, and corruption can erode transactional integrity and disrupt the economic function system's autonomy. To minimize these risks, we propose the implementation of collaborative governance mechanisms that include robust safeguards, such as anti-corruption measures, whistle-blower protections, and independent oversight bodies.

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Xinyue Zhao

Semantic Disturbance and the Limits of Functional Programming: 'Lying Flat' as Disruption in Autopoietic Systems

This paper showcases how the phenomenon of lying flat (躺平) in China, as an ambiguous semantic disturbance, irritates the programming logic of autopoietic systems. It reveals the limits of functional programming and offers insight into how new forms of programming may begin to take shape. Lying flat refers to a personal and informal disengagement from dominant social expectations around work, education, and achievement among young people—juxtaposed with China's highly programmatic systems that emphasise routinised participation and performance.Unlike protest, lying flat is neither coded compliance nor active resistance, but a form of semantic ambiguity that disrupts the link between code and program. It does not generate new oppositional codes, but suspends expected participation in programs that realise dominant distinctions such as productivity, meritocracy, or upward mobility. This opens a critical perspective on the limits of functional programming: meaning can emerge and circulate within systems even when it escapes codification or systemic designation. This invites further investigation into whether lying flat represents a form of silent systemic feedback—or whether it is beginning to stabilise into a new social program.This paper argues that lying flat operates below the threshold of systemic programmability yet exhibits emergent structure. Using Interpretative Phenomenological Analysis (IPA), it explores the lived experiences of individuals who generate fragmented but internally coherent forms of meaning that resist functional integration and guide action outside dominant codes. These orientations—such as revaluing rest, withdrawing from competition, or embracing existential minimalism—may constitute the early stages of what this paper calls proto-programs: pre-structural, semantically stabilised forms of sense-making that may eventually be formalised, absorbed, or defused.By introducing the concept of proto-programs, this paper contributes to social systems theory by illuminating how programs may emerge from ambiguity, refusal, or semantic excess. It connects systems theory with lived experience not to reduce one to the other, but to observe how structural couplings take form. The paper also offers a non-Western perspective on systems theory and protest, expanding how meaning, irritation, and evolution are conceptualised beyond European contexts. In doing so, it rethinks the evolving capacity of systems to respond to diffuse, digitally mediated, and cross-systemic disturbances.

Yisu Li

Embedded Programs: The Cultural Logic Behind the Inertia of China's Education Reform

Despite decades of policy initiatives, educational reform in China continues to face deep structural resistance, often resulting in cyclical patterns of innovation followed by retrenchment. This paper argues that the root cause of this inertia lies not in administrative inefficiency or political interference, but in historically and culturally embedded autopoietic programs, structured systems of meaning and expectation that govern how education operates, adapts, and reproduces itself.

Building on Niklas Luhmann's systems theory and extending it through the recent developments in autopoietic ecology (Watson & Bordeleau, 2025), this study examines how China's education system functions as a self-referential, operationally closed system that processes reform through its own semantic logic.

Two foundational cultural-historical structures are identified as key to China's educational programming: Confucian thought and the imperial examination system. Confucianism, originating in the 5th century BCE, emphasizes moral self-cultivation, social harmony, and hierarchical order, promoting the ideal of the junzi, a morally exemplary person who governs through virtue. These values have long shaped the Chinese understanding of learning as a path to personal and societal advancement. The imperial examination system, established during the Sui dynasty and formalized in later dynasties, translated Confucian ideals into a state-run mechanism for selecting civil officials based on mastery of classical texts and literary skill. It institutionalized these values through procedural mechanisms of standardized assessment and competitive selection, which continue to shape the Gaokao (China's National College Entrance Examination) and the broader educational discourse. These traditions have evolved into recursive, materially instantiated programs that, while modern in form, remain consistent in function, defining success primarily through high-stakes examinations and adherence to fixed standards.

Using the 2021 'Double Reduction' policy as a case study, the paper analyzes how educational reforms are absorbed and recoded within the existing symbolic framework of the system. Rather than serving as a catalyst for transformation, the policy was interpreted as an alternative strategy for exam preparation. Parents continued to seek underground tutoring, schools maintained performance-driven teaching intensity, and systemic expectations remained largely unchanged, illustrating how deeply embedded programmatic

structures reinterpret reform within established semantic codes. These autopoietic programs do not operate in isolation. They are enmeshed within a broader ecology of structurally coupled systems, including families, the state, the economy, and technology. Within this ecology, symbolic codes, institutional routines, and psychological expectations recursively interact to stabilize the system. Parental aspirations for upward mobility (psychic systems), government regulation (political systems), and labor market demands (economic systems) are all processed through the internal distinctions of the education system, such as teachable/unteachable or qualified/unqualified. As a result, external forces cannot induce transformation unless the symbolic architecture of the system itself is reconfigured.

Therefore, effective reform requires the reconstruction of the symbolic programs that encode notions of learning, legitimacy, and fairness. Without such semantic innovation, reform efforts remain vulnerable to recursive inertia (Watson, 2024), where the system appears to change but continues to reproduce itself functionally. Only by altering the normative codes through which the education system observes and reproduces itself can meaningful and lasting transformation be achieved.

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Younsik Kim

Presidential Impeachment as Constitutional Program: Structural Coupling of Law and Politics in South Korea

In a functionally differentiated society, the legal and political systems operate as distinct, self-referential subsystems. Each adheres to its own binary code—legal/illegal for law, and power/no power for politics—and makes decisions based on its internal logic. Despite their operational closure, these systems interact through the constitution as a medium of structural coupling. The constitution, by employing a meta-code—constitutional/unconstitutional—enables political decisions to be transformed into legally valid forms, eventually gaining relevance beyond the political domain in other functional systems. The legal system can justify its decisions internally by borrowing the semantic framework of constitutional law, without requiring external validation. This paper analyses presidential impeachment cases adjudicated by the Constitutional Court of Korea, highlighting them as rare yet telling examples of institutional intertwinement between law and politics. Among them, the 2024–2025 impeachment controversy involving President Yoon Suk-yeol demonstrates how improbable, yet institutionally normalised, interactions between these systems are facilitated through the constitution. While such interactions may seem natural in established democracies, systems theory reveals them as evolutionary achievements that emerged from historically improbable and structurally complex episodes of systemic coordination. In the context of impeachment, the constitution operates as a conditional program: "If the president seriously violates the constitution, then impeachment results in removal from office." This programming enables mutual reference between the political and legal systems, while preserving their respective codes and autonomy. The case illustrates how political legitimacy was pursued through legal procedures, and how legal adjudication sought to maintain its autonomy in the face of political pressures.

However, such programs do not always function seamlessly. The possibility that a legally valid impeachment decision might fail to generate political consequences highlights the limits of structural coupling. In President Yoon's case, the Constitutional Court's interpretation of "seriousness" involved a form of legal balancing that arguably placed an excessive political burden on the court itself. This tension exemplifies how legitimacy can be undermined when the political system challenges or rejects procedurally sound legal decisions. In a highly polarised political context, partisan actors sought to delegitimise the ruling by casting doubt on the procedural foundations of the decision itself.

Their sceptical narratives were amplified through social media, intensifying political polarisation and enabling certain social actors to symbolically opt out of the constitutional order. The ruling emerged in a highly uncertain and risky environment, where many questioned whether the structural coupling between law and politics could hold—namely, whether a legal judgment would be politically and socially accepted without resistance.

Nevertheless, the fact that the ruling has thus far been accepted politically and has contributed to systemic stability suggests a successful restoration of structural coupling, enabled by democratic resilience. Moreover, such cases may indicate the evolutionary transformation of the constitution—from a legal-institutional mechanism into a generalised societal symbol.

Presidential impeachment thus offers a critical lens for examining the institutional conditions and limitations under which law and politics interact while maintaining systemic autonomy. Drawing on Niklas Luhmann's social systems theory, this paper analyses how impeachment functions as a constitutionally programmed interface for intersystemic communication.

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