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Uncertain Communications: Uncertain Social Systems

Zusammenfassung: Der folgende Essay handelt von einer kritischen Untersuchung der Beziehung zwischen Kommunikation und Unsicherheit im Kontext systemtheoretischer Überlegungen. Der Text verfolgt also das Ziel, an die von Dirk Baecker und Siegfried J. Schmidt und anderen initiierte kritische Reflexion anzuknüpfen, die im englischsprachigen Raum kaum Gehör gefunden hat. Es wird im folgenden argumentiert, dass Niklas Luhmanns Sozialtheorie – und zwar trotz seiner Behandlung von Unsicherheit – mit einer unzureichend komplexen Kommunikationstheorie operiert, die letztlich von überstabilen Systemgrenzen ausgeht. Da Luhmann Systemgrenzen nicht als flüssig konzipiert, werden kommunikative Sicherheiten im Sinne von binären Codes überbewertet. Diese Überstabilisierung von Kommunikationen rührt auch daher, dass Luhmanns Theorie sozialen Agenten bekanntermassen wenig Platz einräumt. Der Essay beginnt mit einer vorsichtigen Rekonstruktion der Grenze zwischen System und Umwelt und entwickelt anschliessend einen Vorschlag für unsichere Kommunikationen und unsichere Grenzziehungsoperationen in sozialen Systemen, dargestellt am Beispiel des heutigen ›Massenmedienterrorismus‹.

Introduction

> One should remember that every either/or must be introduced artifically above a substratum where it does not apply.
>
> (Luhmann 1995, 209)

Almost twenty years have passed since the publication of *Soziale Systeme* – Niklas Luhmann's first systematic account of what he described as a supertheory. Even after his untimely death his work exerts a major influence in the German-speaking world (although markedly less so beyond Germany) and yet it is conceivable that the epistemological and methodological radicalism of his theory has to some extent been absorbed by the human and social sciences and that a new, more critical re-evaluation has been underway for a period. Luhmann's work has received scant attention in the English-speaking world and the same lack of interest affects critical accounts of his work. The critical shift in more recent German receptions of his work is in itself unsurprising given the natural course taken by the history of ideas and the capacity of the academic system to integrate what was once considered to be marginal or counter-intuitive. There have indeed been clear signs that social systems the-

ory is being challenged in such a way as to introduce a greater measure of uncertainty into the concept of the system. Suffice it to recent point to works by Siegfried J. Schmidt and Josef Mitterer with their challenges to dualistic epistemology and to the valuable work by Baecker (1999a; 1999b) on ill-defined and well-defined systems and the inescapable ambivalence of communication. Closer to home (the UK in this case), Zygmunt Bauman argues that the growing cleavage between a rigidified social order and subsystems has not been brought about by a colonization of the private sphere by the ›system‹ but by a process of liquefaction (2003, 5). The concepts of loose systems and the liquefaction of social relations between everyday lives and systems offer new points of departure for a critique of systems theory.

The current article shares the intuition that the communication theoretical components of Luhmann's systems theory are in need of revision. This intuition is further driven by recognition of what could be termed the uneasy relationship in Luhmann's work between his theory of systems and his theory of communication. In essence, the former successfully yields a plausible and dynamic analytical framework for the self-reference of social systems while the latter tends to underestimate uncertainty in communication. The inherent uncertainties of communication (see Grant 2001; 2003; 2004) pose serious challenges to a theory of social systems and these will be explored below. In Part One attention focuses on a critical reconstruction of Luhmann's conceptualisation of the frontier between system and environment and argues that systems theory needs to be take greater account of uncertain communication than has hitherto been the case. Part Two follows with a case study based on the complex communicative relations and uncertainties in mass-mediated terrorism which confronts us with an organisation which sets out to destabilise its environment. Part Three is a theoretical account of the porous form of communication with reference to Hegel's theory of the porosity of matter and also to theories of porous media and biological systems to which Luhmann himself refers in *Social Systems* as special categories of systems. The article concludes by arguing that the analytical and epistemological innovations introduced by Luhmann can and should be complemented by a more radical theory of communication which is theoretically coherent and empirically plausible.

1.   Uncertain Communication = uncertain social systems

The paradigm shift in systems theory, as Luhmann himself puts it in *Social Systems* (1995), covers three levels: 1. the foundational level of systems as conceptualisations; 2. machines, social and psychic systems and finally 3. interactions, organisations and societies. Systems theory is a super-theory because it enables the formation of differences to be ›centralised‹ theoretically. This

emphasis on the capacity for theoretical difference-formation is, in part at least, already problematic. Many critics have accused Luhmann of reifying his system concept; and yet it is important to repeat that systems do not correspond to putatively objective realities and are categories of observation and selection. Thus, as Luhmann argues the very critics who accuse him are themselves producing the reification.

Social systems theory has produced highly significant analytical gains as a result of its shift in epistemological paradigm (also including aspects of constructivism). It has enabled a plausible critique of some rather tenacious interaction theories rooted in mutuality, shared knowledge or dialogue and bequeathed by the ›semantic of interaction‹ (see Luhmann 1981). It also enabled a salutary counter-intuitive analysis of the role and discourse of Reason, morality and other aprioris and a rich critique of Habermas' social theory. In Luhmann's provocative formulation: »[T]he eighteenth century discovered that taste can judge more quickly than reason because it can individualize its criteria and can legitimate them by self-observation.« (Luhmann 1995, 46)

Luhmann's systems theory is based on a series of core operations of which attention here will focus on the distinction between closed and open systems (where open systems are said to be non-trivial) and the distinction between systems and their environments (»System differentiation is nothing more than the repetition within systems of the difference between system and environment.« (7)). The primary system category to be analysed is the open variety. Here, communications between systems and environments play a crucial role. The conceptualisation of these communications is the focus of the current article.

Systems are said to be marked by self-reference where self-reference is the precondition for system identity vis-à-vis environments. Since this type of self-referential closure is possible only in relations with an environment, the question becomes how can »self-referential create openness« (9) without which system-environment communication would be *involuted.* The corollary of self-reference is that systems operate between identity (maintenance of their own self-reference) and difference (vis-à-vis environments). Further, if systems operate by means of operational closure in which system identity is maintained by self-reference then, in order to sustain such identity they need to define the boundary between their character as systems and their difference vis-à-vis the environment:

> Without difference from an environment there not even be self-reference because difference is the functional premise of self-referential operations. (Luhmann 1995, 17)

Within a system relations between the elements are said to be complex when the coupling capacity of the elements cannot guarantee couplings with other

elements at all times. In other words, complexity induces selection pressure where »selection pressure means contingency and contingency means risk.« (1995, 25). Contingency can be ›processed‹ in two different ways. Where the environment is perceived as a resource, contingency is absorbed in the system as dependence; where the environment is perceived as information (we should add, following Shannon, that information is uncertainty), contingency is interpreted as risk. In an alternative formulation, complexity is the missing information in the system which would enable it to grasp its environment completely. In the case of social systems this completeness is a chimera since social systems are open, that is reliant on communication, and therefore inherently uncertain.

In the collaboration with Habermas *Theorie der Gesellschaft oder Sozialtechnologie* Luhmann wrote that society was the social system which »institutionalises ultimate, fundamental reductions [of complexity – CG].« (Habermas/Luhmann 1972, 16; my translation C.G.). Schematisation strategies such as the formation of dichotomies or manicheisms in the fight against terror are examples of such complexity-reduction and yet even here we are aware that complexity cannot ever be ultimately reduced. To paraphrase Peirce, a *vague residuum* of uncertainty remains (cf. Grant 2001; 2005).

The frontier between system and environment referred to above is dynamic and Luhmann does indeed acknowledge that information is a form of boundary-crossing traffic. Boundaries enact the ›dual function‹ of separating and connecting systems and environments; they are self-generated in the manner of »membranes, skins, walls and doors, boundary posts and points of contact« (Luhmann 1995, 29). This conception of boundaries represents a refinement of Luhmann's earlier position in the 1970s in which complex systems tend to produce ever more abstract boundaries which mark the exclusion point of indeterminacies (objects of fear, for example) and where these indeterminacies are then interpreted as reducible complexity (Habermas/Luhmann 1972, 19-20; my translation C.G.). As will be discussed in greater detail below, current problems with transnational terrorism offer an illustration of this formulation. *Al Qaeda* is often schematised as irrational (despite the strategically rational ›looseness‹ of its organisational forms) and thus placed beyond recognised social groups. This ex-communication, denied by the mass media and *Al Jazeera* in particular, can be used to legitimate state-sanctioned violence and perhaps reduce citizens' fears. However, the exclusion depends precisely on schematisations and the forms of such schematisations are communication forms such as speeches, memoranda, rewritten treaties. The same schematisations are used by *Al Qaeda* with its simplistic manicheistic discourse relayed by video, satellite telephone and e-mail. Both the excluding system and the excluded rely on communications for the purposes of exclusion or re-absorption in the system. The same dependency makes both operations precarious

since communication is inherently uncertain by virtue of its reliance on media, agents, contexts and listeners. Provisionally we can therefore say, modifying Luhmann's theory of social systems that:
1. the system is self-referential;
2. the system seeks to reduce complexity;
3. the system engages with the environment;
4. the system therefore depends on communications;
5. communications are uncertain;
6. systems self-reference and allo-reference are communication risks.

2.   The communication uncertainty of ›mass-mediated‹ terrorism

Terrorism in the 1970s and 1980s tended to be confined, with groups operating in or near those territories which were the subject of dispute or occupation. Although what could be generally called local or national terrorism still exists today, the emergence of deterritorialised terrorism marks a new phase in the complexity of terrorist groups. And since such groups, with their reliance on the mass media, are communication organisations *sui generis,* this complexity generates new communicative uncertainty in the political and social systems in contexts of security and everyday life. For with a transnational theatre of operations the loose agglomeration that is *al-Qaeda* makes the risk of terrorist attack apparently more arbitrary or at least unpredictable and potentially more global.

While some political commentators view terrorism in terms of a good/evil or rational/primitive manicheism, other scientific contributions seek to focus on the inter-relations between political organisations or states and terrorist groupings as *self-referential systems.* Elliott and Kiel (2004), for example, examine terrorism as a series of ›complex adaptive systems‹ or, borrowing a metaphor from fluid mechanics, ›fluids‹. This conceptualisation offers an advantage over the network model of terrorism since it suggests the adaptive uncertainty of the system in question and sees in such uncertainty a source of organisational dynamics. In contrast to the fluidity of terrorist movements where »boundaries come and go, allow a leakage or disappear altogether, while relations transform themselves without fracture« (Mol and Law cited in Elliott/Kiel 2004, 64), security organisations are based on the structures of »industrial age bureaucracy«. The result is a mismatch between »mechanisms that seek instability and those that seek stability« (2004, 64). The empirical plausibility of Elliott and Kiel's agent-based modelling of terrorist activities will not be further examined here, but it is worth pursuing the analysis of the organisational and therefore also communicational structures of transnational terrorism and discoursal responses to it. In a world in which business and

defence organizations are becoming flexible and capable of rapid response there are clear challenges to prevailing forms of organisation and communication.

In keeping with a theoretical procedure in which communications are seen as interrelated systems of uncertain codes and uncertain agents Crelinsten (2004) also proposes a communication model for the analysis of terrorism where violence is a »form of communication« and in which relations between the controllers and the controlled are understood as relations of complex communicative interaction. There is ample evidence for such a complex choreography (cf. Baecker 2001) of communication: speeches by western leaders engage with and address the discourses of the *al-Qaeda* leadership whose pronouncements seem to exist only as chilling video recordings of uncertain origin against near-lunar backdrops relayed by *al Jazeera.* It is in other words extremely difficult for a western government not to comment in some form on the latest broadcast *al-Qaeda* video or audio speech. The interrelatedness is no more obvious than in the reliance of both protagonists on mass media systems, as noted above. Brigitte Nacos defines the goal of the new, mass-media terrorism as »political violence against noncombatants/innocents that is committed *with the intention to publicize the deed, to gain publicity and thereby public and government attention.«* (Nacos 2002, 17; emphasis in original). It may be open to doubt whether the common criminal wishes to communicate or not; it is not open to doubt that *al-Qaeda* is a particularly fluid organisation for which communication is a core function. More than ever before terrorism relies on the mass media and without mass communication it would be denied its key function as a psychological weapon. In its internal communications, too, *al-Qaeda* uses the full panoply of information technology devices including CD-Rom and satellite phones; its reliance on e-mail was threatened by the use of the ›Carnivore Internet Wiretap system‹ by the FBI but the response was to use new encryption techniques (Nacos, 2002, 109).

The choreography of relations between terrorist and counter-terrorist organisations is additionally complex since definitions of terrorism and security have in themselves become, to borrow Bauman's description, liquid. Crelinsten refers here to ›grey zones‹ or ›zones of ambiguity‹ (2004, 79-80). For each behaviour between controller and controlled, there are four communication dyads: social control/deviance and government/dissent, criminal justice/crime and internal war/revolution. Each dyad is an »established mode of communication between controller and controlled: the communication runs vertically, so to speak, between the top and bottom of the figure, and is confined to one domain or channel […]« (2004, 79). These dyads are already a form of schematisation and support the view that if non-state based or transnational groupings form systems, then state-based actors such as governments or intergovernmental alliances are the environments of such systems and *vice*

versa. A certain communicational reciprocity is thus built into these relations between terrorism and counter-terrorism since a system can only exist by emphasising its difference vis-à-vis an environment. *Al-Qaeda* seeks to promote instability in its environment as a means to promote uncertainty. However, it is not an anarchistic grouping and retains a strongly centralising theocratic core which rests on an interpretation of a canon by privileged interpreters (first and foremost bin Laden).

At the same time, an analysis of communication complexity based merely on mutually hostile systems has the potential to ignore the agents caught between them. The self is caught between the schematisations of two centralising and yet also uncertain worlds of discourse in which he/she is rarely if ever a participant. These communication systems are arcane realms – that is, they are subject to laws of secrecy and confidentiality in the West and clandestinity and fragmentation in *al-Qaeda,* where even responsibility is not claimed or only belatedly from an eerie temporal and geographical distance. The management of such *multivoiced* complexity seems necessary and yet can place the agent under severe informational strain where psychological and social difficulties can arise. Silver *et al.* observe that even six months after the September 11th attacks »41% of individuals in the US still reported fear of harm to their families as a result of future terrorism« (cited in Somer/Tamir/Maguen/Litz 2004, 9).

Whereas Crelinsten considers the architecture of such communication relations in political *organizations,* this article proposes to examine the ways in which terrorist communications are part of two distinct and in many ways mutually hostile systems which form a new interrelated nexus of intertwined communications which filter into our mundane worlds of experience and in this way cannot be said to be marginal occurrences. Caught between two dominant centripetal discourses (that is knowledge systems) built on manicheisms, we cope with flows of new information of systems and a system characterised by extremely high levels of uncertainty. Counter-terrorist responses from governments or security agencies seek to reduce uncertainty with the production of leaflets or public reassurances and yet paradoxically create yet more uncertainty since neither the sources of chatter nor the interpretation of that chatter are divulged. Manicheisms, as a form of binary code, are the denial of uncertainty and yet these discourses cannot escape the mist of an enveloping heteroglossia, in Bakhtin's formulation. Both communication worlds are hybrid: activist rhetoric, the discourse of damnation and redemption, the discourses of civil and universal human rights and free trade and the discourse of apostasy, spiritual superiority and the allegation of decadence. Consider bin Laden's fax to *al Jazeera* in which Muslims in Pakistan were considered to be the defence »against the new Jewish crusader campaign [that] is led by the biggest crusader Bush under the banner of the cross« (reproduced

in Nacos, 2002, 38-39). The simplistic use of trigger-signs (»crusader«, »Jewish crusader«, »campaign«, »banner«, »cross«), designed to provoke outrage in the target audience, reveals much about the assumptions bin Laden makes about his audience. The fluid forms of organisation, complex interconnectedness of a mass mediated terrorism and counter-terrorist operations leave communicative uncertainties unresolved for social agents despite the use of manicheisms or binary codes on both sides. It is now important to offer a formal conceptualisation of the reasons for which communications render social systems such as these irreducibly uncertain.

3.   Forms of Porosity

Unlike Crelinsten, who argues that institutions are porous, and Elliott and Kiel with their emphasis on fluid organizational structures, the term porosity used here (cf. Grant 2000; 2001) relates to communications. Communication is said to be porous since it is context-, agent- and medium-dependent (in allusion to Parsons and Luhmann we could refer here to its *multiple contingency*). The theory of porous communication integrates higher levels of complexity: as the metaphor of the ›pore‹ suggests, communications are complex entities of structures and spaces where spaces of various kinds introduce contingency and uncertainty. For example, two syntactically identical statements will have different meanings if uttered in different contexts and to different people at different times. In view of these spaces, theories in the shadow of the ›semantic of interaction‹ such as intersubjectivity, understanding or consensus can be reconceptualised together with the epistemological foundations on which they are built. In pragmatic interactions, communicative uncertainties are bridged by contingent constructions such as assumptions, imputations and presuppositions between cognitively unique agents (cf. Schmidt 1994). Our knowledge of these uncertainties makes both transcendental theories of communication and understanding and over-stabilised concepts of binary codes equally problematic. Thus it follows that systems which rely on communications such as western governments and media-hungry *al-Qaeda* itself, are porous in their communications – notwithstanding sophisticated encryption. In the case of the latter, the fluid organisational and porous communication structure could offer desirable additional operational capacity in making membership more decentralised and less hierarchical. At the same time, there is not a plurality of discourses in *al-Qaeda* communications since the organisation seeks to operate with a far from complex apostasy/orthodoxy binary code. This code requires communicational centralisation which can expose the organisation to contestation from opposing discourses ranging from the governmental to civil society actors in East and West alike.

Luhmann observes that a communicative social system orders everything in the themes of its own communications into internal and external categories; in other words, the system practises its own system/environment distinction as if it were ›universally valid‹ (1995, 179). Despite the operation of this distinction »Luhmann concedes that »physical, chemical, organic and psychic realities« (e.g. heat) run through this difference. In the case of communication, he further notes that »communicative action is especially suited for the operative execution within the system of the difference between system and environment.« (Luhmann 1995, 180). It is striking here that Luhmann does not see communications in general as having the capacity to cross frontiers between systems and their environments: »However complex its linguistic possibilities and however subtle the structure of its themes, society can never make possible communication about everything that occurs in its environment on all levels of system formation for all systems.« (Luhmann 1995, 182) A good illustration of the emerging gap in complexity between Luhmann's systems architecture and the uncertainty of communications (producers, media, receivers, contexts) which makes any system/environment distinction in turn uncertain is provided by the description of ritualisations:

> Ritualiztions, religious and otherwise, possess a similar function. They translate external uncertainties into an internal schematic that either happens or not, but cannot be varied, and therefore neutralize the capacity for deception, lies and deviant behaviour. Ritualizations make little claim on the system's complexity. (Luhmann 1995, 185)

As noted above, Luhmann's theory of social systems offers a genuinely fascinating account of the control of complexity in complex systems and yet tends both to overstate system stability and underestimate the inherent uncertainties of communication, arguing that »there must be mechanisms that […] produce adequate determinacy« (1995, 83). Thus, despite the fact that disturbances or noise are constitutive of meaning processes, social systems operate with schematizations which facilitate connectivity. In order to ensure the reduction of indeterminacy and maintain its functioning, a system uses schematisms to make »linkages of communication« possible:

> […] further processing requires foreshortening these reciprocal relations to a single point, condensing information in accordance, and absorbing uncertainties so that in the sequel something determinate for new relating is at hand. (Luhmann 1995, 86)

While empirical evidence tends to confirm that systems do indeed use schematisms, binary codes or, at a more abstract level, cultural semantics, it is still the case that all of these procedures depend on communications which are at the very least residually uncertain. Thus, it can also be said that binary codes (acceptance/rejection, legal/illegal, right/wrong) and schematisms are

in themselves porous. Rather than simply presupposing schematism in every communication, as Luhmann suggests, it is proposed here to introduce greater uncertainty into open systems by conceptualising stability, codification or schematisation not as »momentary unamibiguity« [sic!] but as tolerable uncertainty across a scale of interpretations. There is therefore a subtle and yet profound difference between the view proposed here and Luhmann's understanding of stabilisation in communication to ensure systems connectivity since both conceptualisations proceed from the recognition of »permanent fluctuation of linkages in communication as in mind« (1995, 86) but differ in the conceptualisation of the success or otherwise of uncertainty resolution. If communication is uncertain, this resolution is permanently polysemic. Unambiguity is not even temporary but the fiction that only one reading, one interpretation and one option are possible. This is not the case.

The problematic sharpness of Luhmann's binary conceptualisation of codes and schematisms is also revealed in the conception of social meaning systems which use »linguistic coding« or »the doubling of expressive possibilities by a yes/no difference« (1995, 444). In such a system communication is coded as a proposal of meaning which can be accepted or rejected, understood or misunderstood. Control of misunderstanding unfolds recursively:

> Thus a knowledge of how to estimate what can be understood emerges. This knowledge controls each communication and represents the world socially […] and in connection with it there emerges a culturally coded use of symbolically generalized media of communication. (Luhmann 1995, 445).

In terms of social relations, Luhmann argues that the social is only relevant as a »schema of conformity and deviance« (1995, 230) as the only form – a reduced form – in which social complexity is available to human beings. These are primarily binary schematisms based on bivalent epistemology – even if one can be right and wrong. Luhmann thus exaggerates the capacity of systems to manage uncertainty in communications. In effect, systems are required to constantly respond to the changing face of communications. The reduction of complexity leaves a residuum of uncertainty which makes complexity reduction highly precarious and as a result, modifying Bauman, the distinction between system and environment becomes liquid. While it is true to say that ritualisations appear to make few demands of the system, it is also the case that there is an increasing awareness in society of the uncertainty or contingency of rituals, binary codes or schematisms even if new schematism and codes arise and take their place. The legal/illegal binary code is increasingly fuzzy in the case of international law (consider preventive military operations, humanitarian intervention and the shifting definitions of sovereignty. The limits of binary schematisations are also well expressed by the theory of intuition-

istic vagueness which tells us that while we might be aware of the possibility of the distinction between true and false (the principle of bivalence), we are unable to come to a polar verdict (see Wright 2003). In social terms, there is a new community of contingency (Habermas 1998) with processes of sacralisation, desacralisation, detraditionalisation and globalisation/glocalisation. These are instances and experiences when the reflexivity of our communicative practices and awareness of such paradoxes clashes against the self-referential closure of communications systems and this clash in turn reveals the contingency of systems which observe themselves as being stable. Reflexivity need not be seen as a function of rationality but as a quality of ongoing communication. In other words, social agents are reflexively aware of the plurality of codes and rituals and their shifting diversification (consider also how the codes of politics and entertainment have become increasingly hybridised). Agents are also (post acculturation) aware of the self-referential codes of such rituals and there is mounting evidence that agents are increasingly aware of the uncertainty of that self-reference. An example of this is the mounting irrelevance of political parties, the collapsing credibility of politicians and the fact they are caught between two discourses in which truth has become, more than ever before, culturally specific.

A complex communication system assumes the existence of other systems in its environment (»Depending on the depth with which the environment can be perceived, more systems and more different kinds of systems appear in it.« (Luhmann 1995, 187)) Such a system can apprehend the systems in its environment from the perspective of their environments, thus replacing the units of its environment with complex relations between systems ain an environment. The unity of the environment of a system is given by the complex network of system-environment relations which will be described here as a *lattice.*[1] (3) With the plausible abstract theories of relations and units it is easy to overlook the innocuous qualifying statement at the outset of these ideas: everything depends on the sharpness of the definitions a system can make of its environment. Since communications are uncertain relations where agreement is at best a penumbra, these distinctions can only be as sharp as uncertainty will allow. In terms of complex cognitive or social systems distinctions are blurred.

A further example of the complexity gap between systems theory and uncertain communication is provided by the belief that systems ›organise‹ systems in their environments by means of ›differentiation schemata‹ (1995, 187).

1 In classical early communication theory it is interesting to note that Watzlawick and others referred to the fact that open human systems are examples of complexity which can be considered analogous to Moiré patterns as »optical manifestations of the superposition of two or more lattices« (Watzlawick/Bavelas/Jackson 1967, 125). The fuzziness of systems which results from the twin processes of stabilisation and dissipation (Zadeh 1965) can be considered as lattice networks with a partial order (Negoita 1981, 4).

Complex systems produce attention to the contingency of such schemata; complexity means that »both possibilities simultaneously and / or alternatively are at one's disposal.« (188) Despite Luhmann's attempts to couple differentiation schemata to complexity (»there is no natural agreement in the difference schematism and [] the problem does not lie in knowledge schematized as a binary right/wrong.« (Luhmann 1995, 542)), an epistemological problem remains. The complex character of differentiations means that difference is a gradual phenomenon which is mediated by *Sinngrenzen* or meaning boundaries. These meaning boundaries are measured against the presumptive contents of communication: »[…] representations of boundaries serve to order the constitution of elements; they make it possible to assess

which elements form in the system and which communications can be risked.« (Luhmann 1995, 195)

It should be recalled that Luhmann sees the differentiation of systems as a source of indeterminacies which can be manipulated by a system. It could even be argued that communications which cross internal meaning frontiers (Luhmann 1997, 607) are crucial in the generation and control of such indeterminacies and account for the way in which systems ›drift‹ between integration and disintegration (605). Although Luhmann argues that »the system of society can only use communications as systems-internal operations and thus cannot communicate with the environment external to society« (607) it could be contended that the capacity for communication complexity means that communications constantly cross systems frontiers. In terms of cultural and social semantics, the processes of detraditionalisation, denationalisation and gobalisation/glocalisation are examples of this system-crossing. In this way, communications actually challenge the internality of systems reference and induce a much stronger form of drift.

Operations of schematisation, ritualisation or codification require communication. Systems can only differentiate by communication. The theory of porous communication seeks to conceptualise this interplay between communication form and ›non-form‹. The next step in methodological terms is to ›feed back‹ uncertainty into systems and consider the implications for the capacity of systems to make sharp distinctions. For if communications are uncertain by virtue of their dependency on producing and receiving agents, media and contexts and if systems have an operational dependency on communications then it follows that only uncertain distinctions can be constructed by a system. This inherent uncertainty also accounts for the dynamic process of systems evolution. Dynamic social systems can adapt to uncertainty without ever resolving it.[2] Further, if systems depend on communications which are uncertain then it is more important for a system's capacity to adapt to be able to tolerate uncer-

2 For a similar reasoning see Baecker's (1999) account of stochastic resonance and the role of ambivalence in systems operations.

tainty within the system rather than seeing it as a source of external contingency. Parallels have already been drawn between thermodynamics and systems theory in a modelling of systems in human and social science as open systems (see, for example, Krohn/Küppers/Paslack 1994). In their classic account of human pragmatics Watzlawick and Bavelas made a similar point:

> The distinction between closed and open systems can be said to have freed the sciences concerned with life phenomena from the shackles of a theoretical model based essentially on classical physics and chemistry: a model of exclusively closed systems. Because living systems have crucial dealings with their environments, the theory and the methods of analysis appropriate to things which can be reasonably put in ›a sealed container‹ were significantly obstructive and misleading. (Watzlawick/Bavelas 1967, 122)

They conclude that an open system consists of an »integrated hierarchy of semi-autonomous sub-wholes« in which a dyadic interactional system of human-human interaction can easily be conceptualised in the setting of larger systems such as the family. The hybrid structural/spatial character of communication means that systems which rely on communications have an in-built uncertainty. In such a conceptualisation, there is a greater degree of tension between the capacity of systems to reduce or manage complexity and the uncertain communications on which they rely for their interactions with their environments.

As mentioned above, Baecker's distinction between well-defined and ill-defined systems shares some of the criticisms set out here. Whereas well-defined systems are like trivial machines in being stable in time, in ill-defined systems transitions between the stages in a system are not known, the probability of transitions is not known and the system itself is unstable in time. One such system is man. The paradox is that the social system, composed of ill-defined systems and error-prone agents[3] is actually a well-defined system (Baecker 1999a, 19). Agents interact better with poorly defined systems and do not wish to be confronted with over-determined systems in which their autonomy as agents is denied. In this way, it can be said that organisations are »more or less manageable mixes of order and disorder, redundancy and variety, loose and firm coupling« (25). While the correlation between uncertain and communications and porous systems shares some common ground with Baecker's account, it places the systems-theoretical bias towards degrees of systems definitions (whether these be internal or external, well- or ill-defined) in a different context in which communications are the primary object of analysis. Descriptions by an observer of systems as having varying degrees of

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3   Luhmann explicitly discards an agent-based approach to his systems theory. However, consider the reintroduction of agents in the work of Schmidt (e.g. 2003).

definition or sharpness tend to neglect factors which criss-cross all systems and neglect these dynamic influences. There is therefore a need to reintroduce communications as universal and uncertain environments in which systems definitions and self-referential process are always subject to risk and change. The notion of porous systems built on uncertain communications is an adaptation of conceptual frameworks in studies of porous media in geophysics and biology. In geophysical analysis, a »porous medium is defined as a portion of space that is occupied partly by a persistent solid phase (= the solid matrix) and partly by a void space, the latter being occupied by one or more fluid phases.« (Bear/Bachmat 1984, 5) Since the concept cannot be crudely imported from such a geophysical modelling into reflections on social communications, it is necessary to consider some of these physical properties at a general level before returning to communication processes *per se.* Here, the two key characteristics of a porous medium can be summarised as void space and solid phase or, alternatively, as cavities and solid form (Adler/Thovert 1999, 377). For an analysis of porosity as a generally valid description of form it is worth recalling Hegel's reflections on porosity in the *Science of Logic* (1812). In Section Two on Appearance Hegel provides a formal analysis of the Thing into which Matters »circulate freely«. Furthermore, the determinateness of this Thing renders it at the same time dissoluble where dissolution is an external process of being determined (Hegel 1976, 494). The Thing is an interrelation of its constituent matters – the one and the others, the self-related matters which are matters in relation to and by distinction to each other. There is, in the identity of the thing, what Hegel calls interpenetration. Here, since the Thing is the ›also‹ of others and the matters are determinate in themselves, they are »indifferent« to each other and »*do not touch* one another« (495). This is a description of the thing as »absolute porosity« – the interrelation of form and non-form:

> This thing has the two determinations of being *first, this thing,* and secondly, the ›also.‹ The ›also‹ is that which presents itself in external intuition as *spatial extension;* but the ›this‹, the negative unity, is the *puncticity* of the thing. […] Therefore where one of these matters is, the other also is, *in one and the same point;* the thing does not have its colour in one place, its odorific matter in another, its heat matter in a third, and so on. Now because these matters are not outside one another but are one in ›this‹, they are assumed to be *porous,* so that one exists in the interstices of the other. But that which is present in the interstices of the other matter is itself porous; conversely, therefore, in its pores the other exists […]. (Hegel 1976, 496)

By a process of formal analogy it is argued here that communications provide a particularly relevant example of porous form since a communication is an acoustic or graphematic form amidst its non-form: silence or absence. And yet, this absence is a constitutive part of communication which cannot be sub-

tracted. While communications dwell in the interstices of silence so silence dwells in the interstices of communication. Communications are lattice-works of morphological and semiotic properties. Their free circulation is ensured by universal connections with all communicating agents but their forms are constantly displaced by context, user and receiver. No schematism can ever successfully fill the indeterminacies which are constitutive of communication. Social systems operate amidst such uncertainty for they are communication-dependent. To preserve their stability as systems institutions they are endowed with codes or discourses as complex schematisations. These schematisations function as stabilisers of vague semiotics in which a vague residuum always persists (Peirce 1955). Potential destabilising effects are fed back into the system recursively. However, even self-referential semantics (such as legal codes) remain, however residually, uncertain. Communicative stabilisation requires communication and with communicative interaction risk commences.

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