

LUHMANN, N. Ecological Communication, 1989 (1986) Parte 1  
[Anja Pratschke e Mariah Guimarães Di Stasi, maio 2019]

Parte Anja: Introduction até p.28

“Als Beobachter der Welt können wir nach Luhmann nur das erkennen und beschreiben, was für uns beobachtbar ist.” [Como observadores do mundo, de acordo com Luhmann, só podemos reconhecer e descrever o que é observável por nós. LUHMANN, N. tradução nossa]

quem é Niklas Luhmann? [[wikipedia português](#)] [[wikipedia inglês](#)] [[wikipedia alemão](#)], vídeo: [[Luhmann's Zettelkasten](#) /caixas de anotações, 2min] [[documentario sobre teoria e risco ecologico](#), 42.14min, subtítulos em espanhol] [[explicando Luhmann, video em portugues, 39min](#) ]

Motivação da escrita

Can Modern Society adjust itself to the exposure to ecological dangers? [p.XVII]  
[A sociedade moderna pode se ajustar à exposição a perigos ecológicos?

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this justifies ascribing ecological problems to society and not only to failures of politics and the economy or to an insufficient feeling of responsibility. [p.XVII]  
[isso justifica atribuir problemas ecológicos à sociedade e não apenas a fracassos da política e da economia ou a um sentimento insuficiente de responsabilidade.]

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Only from this insight does it follow that the solution to this problem can be found in new ideas about values, a new morality, or an academic elaboration of an environmental ethics.

[Somente a partir desse insight se conclui que a solução para esse problema pode ser encontrada em novas idéias sobre valores, uma nova moralidade ou uma elaboração acadêmica de uma ética ambiental.]

powerful synthesis of several quite diverse intellectual traditions. At least four of these can be distinguished: (1) the systems-theoretical approach to social action found in the writings of Talcott Parsons; (2) the cybernetic interpretation of the relationship between system and environment; (3) a phenomenological disclosure of meaning and its importance for the relationship of the components of social systems; and (4) an autopoietic understanding of system-organization. *Ecological Communication* – and indeed all Luhmann's recent works – can be understood only through a clarification of these four separate intellectual traditions and the way in which he combines them. I would like

Luhmann combina quatro tradições intelectuais para esta reflexão: the systems-theoretical approach to social action, the cybernetic interpretation of the relationship between system and environment, a phenomenological disclosure of meaning and its importance for the relationship of the components of social system, and an autopoietic understanding of system organization.

quem é [Talcott Parsons](#) / relação com a cibernética

Parte 1 / Problematização e contextualização [p.1- 51]

### 1 Sociological Abstinence

ecology, a term , only 50 years old [p.1]

> Contemporary society feels itself affected in many different ways by the changes that it has produced in its own environment. [p.1]

[A sociedade contemporânea se sente afetada de muitas maneiras diferentes pelas mudanças que produziu em seu próprio ambiente.]

produced in its own environment. This is clearly shown by a number of these: the increasingly rapid consumption of non-replaceable resources and (even if this would prove beneficial) the increasing dependence on self-produced substitutes, a reduction in the variety of species forming the basis of further biological evolution, the ever-possible development of uncontrollable viruses resistant to medicine, the familiar problem of environmental pollution and not least of all over-population. Today these are all themes for social communication. Society has thus become alarmed as never before<sup>1</sup> without possessing, however, the cognitive means for predicting and directing action because it not only changes its environment but also undermines the conditions for its own continued existence. This is by no means a new problem. It appeared in earlier stages of social development too.<sup>2</sup> But only today has it reached an intensity that obtrudes as a 'noise' distorting human communication that can no longer be ignored.

As far as sociology is concerned this discussion began – like  
p.1

sociology é preocupado originalmente com os aspectos internos da sociedade [p.2]  
necessidade de mudança de paradigma! p.4

Totally absorbed in its own object, sociology did not even notice that a reorientation had already started among the natural sciences, begun by the law of entropy. If this law that declares the tendency to the loss of heat and organization is valid then it becomes even more important to explain why the natural order does not seem to obey it and evolves in opposition to it. The answer lies in the capacity of thermodynamically open systems – those related to their environments through inputs and outputs – to enter into relations of exchange, i.e., environmental dependency, and nevertheless to guarantee their autonomy through structural regulation. Ludwig von Bertalanffy appropriated this idea and used it as the basis for what today is called ‘general systems theory’.<sup>7</sup>

It would be unfair, however, to say that sociology did not take account of this at all because there are some programmatic similarities.<sup>8</sup> For example, research in the sociology of organizations, emphasizing the environmental reference of organizations, has been successful.<sup>9</sup> But here the environment always means something internal to the society, for example, markets or technological innovations, in other words only society itself.<sup>10</sup>

[p.4]

Despite this, it has become obvious that as scientific research progressed respect for ‘natural balances’ increased, whether this was in ecological relations, foreign cultures or even today in developing countries and their traditions. But at the same time, one’s own society was exposed to an incisive critique that was replete with demands for intervention, *as if it was not a system at all*.<sup>16</sup> Obviously this reveals a negative ethnocentrism, and it is possible that a significant aversion to ‘systems theory’ has had something to do with the critical restraint this theory has directed against its own society.

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“[...] falta de estrutura teórica da questão ecológica, de tratar todos os fatos em termos de unidade e diferença, quer dizer em termos de unidade da interconexão ecológica e a diferença do sistema e do ambiente, que quebra essa interconexão.” p.6

Therefore the systems-theoretical difference of system and environment formulates the radical change in world-view. This is where the break with tradition is to be found, not in the question of a crude and insensitive exploitation of nature. Indeed, historical investigations of the concepts of *periechon*, *continens*, *ambiens*, *ambiente* and medium can show that what is today called environment was viewed by the Greek and even the medieval tradition as an encompassing body, if not as a living cosmos that assigned the proper place to everything in it.<sup>18</sup> These traditions had in mind the relation of a containment of little bodies within a larger one. Delimitation was not viewed as the restriction of possibilities and freedom but instead as the bestowal of form, support and protection. This view was reversed only by a theoretical turn that began in the nineteenth century when the terms '*Umwelt*' and '*environment*' were invented and which has reached its culmination today: systems define their own boundaries. They differentiate themselves and thereby constitute the environment as whatever lies outside the boundary. In this sense, then, the environment is not a system of its own, not even a unified effect. As the totality of external circumstances, it is whatever restricts the randomness of the morphogenesis of the system and exposes it to evolutionary selection. The 'unity' of the environment is nothing more than a correlate of the unity of the system since everything that is a unity for the system is defined by it as a unity.

p.6

## 2 Causes and responsibilities

- > aumento de complexidade modifica o ponto de observação da problemática ecológica.
- > causas geram procura de responsabilidades.
- > problemas devem ser eliminados nas suas fontes.

mas, a tipologia do problema e a análise sistêmica-teórica demanda uma mudança de aproximação: a reconstrução do problema de uma perspectiva sistêmica, uma que é sensível aos efeitos de mudanças ecológicas. [seguros e governos agem assim, trabalhando com o *Verursacherprinzip* [causer-principle] indicando a diferença...alternativas são rejeitados , como subvenções por exemplo. p.8

significance of the causer-principle, then, is not a causal statement but, as so often, a statement indicating a difference: alternatives (for example, subventions) are rejected because of the expense to the general public.

Science has long since left this practically significant stage of analysis behind. In the age of systems-theoretical analyses causal interconnections have been viewed as extremely complex and, in principle, opaque – unless their determination is simplified through a more or less arbitrary attribution of effects to causes. The last three decades' research into attribution shows that the real problem resides in the attribution of habits and procedures that illuminate and give importance to a selection of the many causes and effects.<sup>4</sup> More exactly, the determination of causes, responsibility and guilt helps to identify non-causes (*Nichtursachen*) and to determine innocence and the absence of responsibility too. If the producers fall on the one side then consumers must fall on the other. In this way the attribution procedure shows its real importance in providing exculpation.

p.9

sociedade é responsável, e nós já sabemos disso!

p.10

//// como entender o papel da natureza? meio ambiente e cultura : cultura cristão exemplos

'We really can change the whole thing', is a slogan that could still be heard even quite recently. Courage is all that is needed – and cybernetic guidance! Complexity has simply been exploited insufficiently until today causing all kinds of mistakes and problems for the system's output. Instead, the system has to use variety (i.e., number of possible states) to control variety and in this way, acquire the <sup>control</sup> requisite variety for running the world'.<sup>1</sup> This kind of optimism seems to have passed. It underestimated the much discussed problematic of structured complexity. Above all, it did not understand that the concept of complexity itself designates a unity that acquires meaning only in reference to difference, indeed in reference to the difference of system and environment.<sup>2</sup>

It is not saying much to state that the world or a system is

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If this evaluation of the evolution of social complexity and ecological problems is correct, then the question of the 'domination of nature' has to be reformulated. It is no longer an issue of a greater or lesser technological control over nature or even of sacred or ethical road-blocks. Nor is it a matter of the protection of nature or of a new taboo. To the extent that technological intervention changes nature and problems result from this for society, *greater* rather than *less competence for intervention* has to be developed, but practiced according to criteria which *include reaction on itself*. The problem does not lie in causality but in the criteria for selection. The question that follows from this is twofold: (1) is there enough technological competence for selective behavior, i.e., does it give us enough freedom *vis-à-vis* nature? (2) is there enough social, i.e., communicative, competence to be able to carry out the selection operatively?

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Concepts like complexity, reduction, self-reference, autopoiesis and recursively closed reproduction with environmentally open irritability raise complicated theoretical questions that cannot be pursued in all their ramifications in what follows. So we will simplify the presentation by describing the relation between system and environment with the concept of *resonance*. We will also assume that modern society is a system with such a high degree of complexity that it is impossible to describe it like a factory, i.e., in terms of the transformation of inputs into outputs. Instead, the interconnection of system and environment is produced through the closing-off of the system's self-reproduction from the environment by means of internally circular structures. Only in exceptional cases (i.e., on different levels of reality, irritated by environmental factors), can it start reverberating, can it be set in motion. This is the case we designate as resonance. One can imagine a dictionary that would define nearly all the concepts that it uses by referring to other definitions and would allow reference to undefined concepts only in exceptional cases. An editorial committee could then be formed which would supervise whether language changes the meaning of those undefined concepts or, through the formation of new ones, disturbs the closure of the lexical universe without determining how changes in the entries are to be handled when this disturbance occurs. The richer the dictionary, the more it is kept going by the development of language, i.e., the more resonance it will be able to produce.



The same is true for the process of communication in the social system. We can formulate the question of the ecological basis of and danger to social life much more exactly if we look for the conditions under which the states and changes in the social environment *find resonance* within society. This is by no means something that is more or less self-evident. On the contrary, it is improbable according to systems theory. From the evolutionary point of view one can even say that sociocultural evolution is based on the premiss that *society does not have to react to its environment* and that it would not have taken us where it has if it proceeded differently. Agriculture begins with the destruction of everything that had grown there before.

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Frank Lloyd Wright / Arquitetura orgânica // Buckminster Fuller / Cedric Price...Arquitetura e ressonância //

references, i.e., accessible only sequentially and selectively. Only one of these possibilities can be pursued at any time, and every advance creates more possibilities than can be handled subsequently.<sup>2</sup> This is what Husserl meant when he described the world as the 'horizon' of actual intentions. It is actual as a horizon, never as a *universitas rerum*. One can see in this a formula, as it were, for the insolubility of ecological problems, even though, at the same time, it is known that every reference leads to something determinate or determinable<sup>3</sup> – that there are no paradoxes.

In other words, meaning is a representation of world complexity that is actualizable at any moment. The discrepancy between the complexity of the actual world and consciousness's capacity for apprehension or communication can be bridged only when the

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técnicas de diferenciação, experimentos: positivo, negativo....[exemplo : floresta de eucaliptos de rio Claro...]

This differentiation theorem has far-reaching consequences. It implies:

- 1 That important performances of the societal system are constantly executed by *subsystems* because this is the only way to achieve a sufficient level of complexity, and that in order to explore how a society can react to the exposure to ecological dangers the constraints on the possibilities of its subsystems must be examined. These in turn depend on the form of social differentiation.

- 2 The system's unity can, if necessary, be *represented* within the system itself, where the concept of representation is understood as a *representatio identitatis*, and not as a taking-the-place-of-something-else. Representation is the reintroduction of the system's unity within the system itself. This creates a *difference* within it, whether this is sought or not.<sup>9</sup> The presentation of the system's unity within the system itself must therefore fit the pattern of system differentiation. It may appear as the 'top' if the system is differentiated in a hierarchical manner, i.e., presents itself as stratification. Or it may appear as the 'center' if the system is differentiated according to the center/periphery pattern (for example, city/countryside). It cannot choose any of these forms of presentation if none of these forms of differentiation exists. We will also have to consider whether there are further possibilities and whether the exposure to ecological danger could be an occasion to develop other possibilities.
- 3 Since every operation is only one among many, every operation within the system is observable by others. Formally, observation means being treated as information on the basis of a pattern of difference, normally through expectations that are fulfilled or not. In this sense, self-observation constantly accompanies the operations taking place within society. This observation creates additional effects of its own, often in opposition to those that the operations themselves intend. Thus, on the one hand, there can be an immediate stifling of initiated plans and, on the other, an effect-explosion which neither waits for nor depends on the operations reaching their intended goals.

*Observation of Observation*

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say that a system can see only what it can see. It cannot see what it cannot. Moreover, it cannot see that it cannot see this. For the system this is something concealed 'behind' the horizon that, for it, has no 'behind'. What has been called the 'cognized model'<sup>1</sup> is the absolute reality for the system. It has a singular quality of being or, logically speaking, univocality (*Einwertigkeit*). It is what it is, and if it turns out that it is not what it seems to be then the system has made a mistake! The system can operate only with two values when it uses the distinction of self-reference and other-reference.

All this necessarily holds true for a system's immediate observation of what presents itself as environment to it. Nevertheless, a system that observes *other* systems has other possibilities. Even if it posits its environment apodictically, like every other system, the observation of a system by another system – following Humberto Maturana we will call this 'second-order observation'<sup>2</sup> – can also observe the restrictions forced on the observed system by its own mode of operation. The observing system can discover that the environment of the observed system is not constituted by *boundaries* at all, but, perhaps, by *constraints*. It can observe the horizons of the observed system so that what they exclude becomes evident. Using this, it can clarify the mode of operation of the system/environment-relations in a kind of 'second-order cybernetics'.<sup>3</sup>

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In many ways modern society has opened up possibilities for observing and describing how its systems operate and under what conditions they observe their environment. The only drawback is that this observing of observing is not disciplined enough by self-observation. It appears as better knowledge. But in reality it

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is only a particular kind of observing of its own environment.<sup>10</sup> Under these conditions the idea that rational consensus ought to be attained is quickly trivialized. Those who think they know that this is going to be a protracted enterprise use this idea and test their willingness to make concessions according to their own judgement. But every operation and every observation has structural limitations, which is precisely what second-order observation makes clear. A better evaluation of the situation is attainable only when this insight is applied to itself, i.e., is employed recursively. When this is done the constraints on the ability to observe, describe and turn insights into operations have to be analysed and compared. Any protest against such constraints would be strangely naive and, as such, would merit observation itself – if not by the protester then at least by others who observe the protester.

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Parte 1: Mariah: p. 28-51

## 6 Communication as a Social Operation

So the question is how, as an operatively closed system of meaningful communication, does society communicate about its environment? More specifically, what are its possibilities for communicating about exposure to ecological dangers? (p.28)

- Um ambiente degradado, poluído e nocivo, não necessariamente é uma comunicação com o meio social, mas o espaço onde pode acontecer. (p.28)
- A sociedade é aberta ao ambiente, mas é um sistema fechado operativamente (p.29) Seu único modo de observação é através da comunicação.

Communication is an exclusively social operation. On the level of this exclusively social mode of operation there is neither input nor output. The environment can make itself noticed only by means of communicative irritations or disturbances, and then these have to react to themselves. (p.29) (Homeostato)

Using concepts introduced by Francisco Varela one can say that there is no coupling by input, only coupling by closure. (p.29)

Whatever 'ecological awareness' may occur empirically within a consciousness, it is still a long way from this to a socially effective communication. (p.29)

- “Somente quando (e por razões que não podem ser atribuídas a uma consciência) a comunicação ecológica é posta em movimento e começa a co-determinar a auto-poiese da comunicação social, pode-se esperar que os temas dessa comunicação se tornem gradualmente conteúdos conscientes também”. (p.30)

[...] a communication system's structures are highly flexible. (p.30)

- “Mesmo que uma 'consciência ecológica' surja em alguns sistemas conscientes ou outros, ela teria propriedades que seriam quase inúteis para a sociedade. Seria sobre determinado de forma perceptível ou intuitiva. De qualquer forma, isso é o que a teoria dos sistemas subjacente conclui”. (p.30)

## 7 Ecological Knowledge and Social Communication

So the key question becomes how society structures its capacity for processing environmental information. (p.32)

Archaic social systems were also responsible for important and irreversible environmental changes. The desolation brought about by deforestation is a good example of this, and demonstrates that the problem is not new. (p.33)

- Pensamentos arcaicos e atribuições religiosas para explicações das condições foram postos de lado, colapsados e confrontados. (p.34)

This means that knowledge now has to be understandable in itself. (p.34)

[...] today, each of the most important subsystems of society is directed to a specific and primary function that pertains to it alone. This formative principle explains the enormous growth of modern society's performance and complexity. At the same time it reveals the problems of integration, i.e., of the negligible resonance capacity among the subsystems of society as well as the relation of society to its environment. (p.34-35).

## 8 Binary Coding

How can environmental problems find resonance in social communication if society is differentiated into function systems and can react to events and changes in the environment only through these? (p.36)

The most important function systems structure their communication through a binary or dual-valued code that, from the viewpoint of its specific function, claims universal validity and excludes further possibilities. (p.36). (Analogias: Legal/ Illegal, etc.)

The significance of these functional domains for the modernization of contemporary society will become evident immediately once we approach the problem of steering communication through binary codes. (p.37)

As one can see, from the standpoint of a second-order cybernetics, i.e., from the observing of observations, every binary code resolves tautologies and paradoxes for the system that operates with this code. The unity that would be unbearable in the form of a tautology (for example, legal is legal) or in the form of a paradox (one cannot legally maintain that one is legal) is replaced by a difference (in this example the difference of legal and illegal). Then the system can use this difference to steer its operations. (p.37)

Características importantes da estrutura:

- 1) Os códigos são construções totalizantes, isto é, construções abrangentes que reivindicam universalidade e não possuem limite ontológico. (p.38)
- 2) Como referência a tudo o que pode ser tratado como informação dentro do código, a totalização leva à contingência de todos os fenômenos sem exceção. (p.38)
- 3) Produz uma conexão entre codificação e especificação funcional no processo de evolução: certos códigos binários são usados somente quando as operações a serem codificadas ocorrem no sistema de funções correspondente. (p.38]0
- 4) Os códigos, como já foi mencionado, resolvem o paradoxo inerente à problemática subjacente a toda relação auto-referencial. Se ajustando para manter os paradoxos conforme surgem divergências dos padrões. (p.39)
- 5) A codificação usa e reforça o velho ditado de que os opostos atraem. É programado para um oposto ser processo de forma a encontrar seu outro oposto. (p.39)
- 6) Na codificação binária, o valor orientador do código (verdade, justiça, propriedade, etc.) tem, ao mesmo tempo, que renunciar ao seu direito de servir como critério de seleção, porque isso contradiz a equivalência formal de posição e negação. (p. 39-40)
- 7) A diferença de código e critérios para operações corretas (ou de codificação e programação) torna possível a combinação de fechamento e abertura no mesmo sistema. Quanto mais abstrata e técnica for a codificação, mais rica será a multiplicidade das operações (internas) com as quais o sistema pode operar como fechadas e abertas ao mesmo tempo, ou seja, reagir às condições internas e externas. (p.40)
- 8) Um código triplo, talvez do tipo verdadeiro / falso / meio ambiente ou legal / ilegal / sofrimento, faz com que o reaparecimento do terceiro valor seja possível; mas apenas para co-dirigir a alocação dos valores de código. (p.40-41)
- 9) Além disso, codificação significa a bifurcação de operações e as estruturas construídas sobre elas com a conhecida conseqüência da constituição da complexidade historicamente irreversível. Dentro do sistema não se pode decidir se todas as falsidades são falsas, se toda injustiça é ilegal e a expropriação da propriedade é concebível apenas como revolução. (p.41)
- 10) A codificação canaliza todo o processamento de informações adicionais para seu domínio e é guiado principalmente por sua distinção inicial, porque essa é a única maneira de gerar informações e coordená-las com um sistema de funções. (p.41)
- 11) A evolução cria suas próprias condições à medida que progride e pára quando e enquanto isso não for bem-sucedido. (p.42)

12) Como os sistemas de funções não são diferenciados como regiões, mas sim por meio de diferenças, um alto grau de dependência recíproca é possível. A diferenciação funcional promove a interdependência e uma integração de todo o sistema porque cada sistema de funções deve assumir que outras funções devem ser cumpridas em outro lugar. (p.42-43)

My position is that binary codes having these characteristics occur in social evolution and that, if they are put into operation, corresponding systems tend to be differentiated. (p.43)

## 9 Codes, Criteria, Programs

[...] two levels have to be distinguished in the analysis of system structures: the level of coding and the level on which the conditions of the suitability of operations are fixed and, if necessary, varied. (p.44-45)

### *Coding and Programming – significados*

- On the level of coding a system is differentiated by means of a binary scheme. (p.45) (closed system)
- Programs, however, are given conditions for the suitability of the selection of operations.

[...] through the differentiation of coding and programming a system acquires the possibility of operating as closed and open simultaneously. (p.45)

For the history of ideas we now find belief in progress with its supporting metaphysics in a period of transition. The new order of functional differentiation opens up possibilities that could not develop according to the levels of the old society. An entirely new kind of theory of reflection becomes possible. (p.46)

Even if one defers the question of ecological problems for the present, it can still be assumed that functional differentiation [...] leads to new ways of formulating problems and new theories of reflection. (p.46)

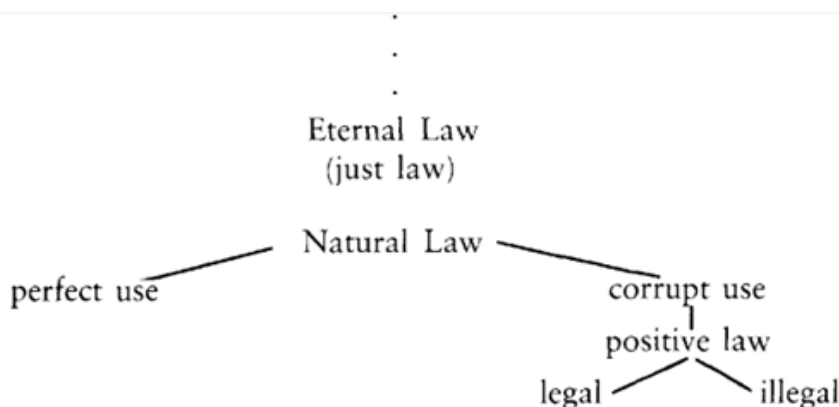


Figure 1 Hierarchical construct of the legal system



	code	program
unity	?	justice
operation	legal/illegal	valid legal norms

Figure 2 Differentiated construct of the legal system

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[...] the internal dynamics and sensitivity of function systems like politics, economy, science or law are disturbed by environmental problems. Sometimes this happens directly as when resources dry up or catastrophes threaten. But it also occurs indirectly via socially mediated interdependences when, for example, the economy is forced to react to legal precepts even if it would attain better results following its own ideas. (p.48)

On one hand, functional differentiation is possible only through the rejection of redundancy. (p.48)

On the other hand, functional differentiation triggers an enormous internal dynamics within the function systems which combines intense resistance with very specific sensibilities to irritations and disturbances. (p.49)

[...] social resonance as a whole is not merely the sum of the resonances of each of the specific function-systems. The subsystems are environments for one another. They can produce a process of resonating disturbances when one subsystem reacts to environmental changes and alters the social environment of the other subsystems. (p.49)

But disturbances are not the only things transmitted and thereby partially absorbed and reinforced. The working together of function systems is also necessary in practically all cases. (p.49)

Society's resonance therefore has to be analysed on two levels at the same time. On one hand, resonance is conditioned by society's differentiation into function systems. On the other, it is structured by the different types of codes and programs of the subsystems that affect one another according to the general model of system and environment. (p.50)

As one can see readily, this produces effects within the system which are unlike the changes in the environment that originally triggered them. These in turn are observed with respect to their own degree of danger and so are in need of control. (p.50)