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Productive misunderstandings between organisation science and organisation practice: the science-practice relation from the perspective of Niklas Luhmann's theory of autopoietic systems

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1. Introduction

Many recent studies have voiced the growing concern that the body of knowledge that springs from organisation science is hardly taken notice of in management practice. This has given rise to urgent calls for making organisation research more relevant to practitioners and an intensive debate on how to realise this aim has set in (e.g. Hodkinson et al. 2001; Rynes et al. 2001; MacLean/MacIntosh 2002; Baldridge et al. 2004; Van de Ven/Johnson 2006). In most of the existing literature one can identify three main reasons for the observable lack of connection between organisation research and practice: research is not sufficiently focused on the 'real' problems of practitioners (e.g. Rynes et al. 1999), research results are not properly disseminated to practitioners (e.g. Spencer 2001) and the language of science is not properly translated into the language practitioners use (e.g. Starkey/Madan 2001; Van de Ven/Johnson

2006). The underlying assumption is that if scientists redressed these shortcomings their findings would be utilised by practitioners and thus the gap between theory and practice would be bridged.

The aim of this chapter is to contrast this recent debate on the relation between science and practice with an analysis from the perspective of Niklas Luhmann's theory of autopoietic systems. According to this perspective, the lack of any transfer of scientific knowledge to practice needs to be understood as the inevitable result of the differentiation between organisation science and the so-called 'management practice', which function according to different logics. This impedes the transfer of knowledge from the field of science to that of practice. Hence, from this perspective the practical irrelevance of management science is not a problem that can be resolved. On the contrary, only because of this differentiation, and thus, the impossibility of any direct transfer of meaning, can science be as productive as it is. The idea of organisation studies as an 'applied science' is a mere illusion.

This chapter is structured into six sections. After the present introduction, section two will introduce the basic elements of Luhmann's theory of social systems as autopoietic systems of communication. Section three will describe the conceptualisation of science, economy and organisation as three different types of social systems that operate according to different logics of communication. Section four will deal with the impossibility of any transfer of meaning between management science and management practice. As we will see in section five, this impossibility does not imply that management science and management practice have no impact on each other: science and practice cause in each other mutual 'perturbations', whose meaning is determined by the receiving system. We conclude with some comments on the implications of this perspective for research policy.

2. Social systems as autopoietic systems of communication

Niklas Luhmann (1927–1998) was one of the most influential sociologists to have drawn on the concept of autopoiesis. The two Chilean cognitive biologists Humberto Maturana and Francisco Varela had introduced the concept of autopoiesis in the early 1970s to conceptualise life, i.e. the aspect that distinguishes what they called a living from a non-living 'machine' (Varela et al. 1974). They write:

> An autopoietic machine is a machine organized (defined as a unity) as a network of processes of production (transformation and destruction) of components which: (i) through their interactions and transformations continuously regenerate and realize the network of processes (relations) that produced them; and (ii) constitute it (the machine) as a concrete unity in space in which they (the components) exist by specifying the topological domain of its realization as such a network. (Maturana/Varela 1980: 78)

Central to the concept of autopoiesis is the idea that a system is produced and reproduced by interactive processes among its components. In other words, through its components the system reproduces itself.

In contrast to allopoietic systems, none of the elements of autopoietic systems are produced by agents external to the system. All processes of autopoietic systems are produced by the system itself and all processes of autopoietic systems are processes of self-production. In this sense, one can say that autopoietic systems are *operatively closed*. There are neither elements entering the system from outside nor vice versa. A system's *operative closure*, however, does not imply a closed system model. It only implies that no operations can enter or leave the system. Autopoietic systems are, nevertheless, also open systems: all autopoietic systems

have contact with their environment (*interactional openness*). Living cells, for example, depend on an exchange of energy and matter between themselves and their surroundings, without which they could not exist. The contact with the environment, however, is regulated by the autopoietic system; the system determines when, what and through what channels there is an exchange of energy or matter between itself and the environment (undoubtedly, there are some external forces that might influence the system directly, e.g. radioactive radiation, which can destroy parts of the system. These influences, however, can never determine what *operations* take place in a system).

Luhmann (1986, 1995) argued that the concept of autopoiesis, if abstracted from its biological references, could also be applied to other domains, particularly to the social domain. In contrast to other social scientists who used the concept of autopoiesis only metaphorically (e.g. Morgan 1997) or who tried to apply it *directly* to the social domain (e.g. Beer 1980; Robb 1989; Zeleny/Hufford 1992), Luhmann first abstracted it into a general concept on a transdisciplinary level, then redefined it as the specific concept of autopoiesis with reference to particular types of non-biological systems (Luhmann 1995; for an overview of different applications of autopoiesis to the social domain see Mingers 1995). Apart from living systems Luhmann identifies two additional types of autopoietic systems: social systems and psychic systems (or minds). While living systems reproduce themselves via biological processes, social systems reproduce themselves via communication processes, and psychic systems via mental processes. Whereas the elements of living systems are physical substances, those of social and psychic systems are elements of meaning. In the following we will concentrate on Luhmann's theory of *social* systems.

For Luhmann the elements of social systems are communications (Luhmann 1986, 1995). Yet, in contrast to the conventional notion of communication as the transfer of meaning from

a sender to a receiver, Luhmann conceptualises it as the unity of three components: (1) information, (2) utterance and (3) understanding. 'Information' refers to the question of *what* is being communicated while 'utterance' concerns the question of *how* and *why* it is communicated. Yet, the central component of communication is 'understanding', which is absent from most other conceptualisations of communication. Understanding is the distinction between information and utterance. For a communication to be understood, the information has to be distinguished from the utterance: what is being communicated must be distinguished from how and why it is communicated. It is the understanding which determines the other two components, i.e. the information and the utterance. In this context, Luhmann (1995: 143) writes: 'Communication is made possible, so to speak, from behind, contrary to the temporal course of the process.'

Luhmann argues that communication conceptualised as the *unity* of utterance, information and understanding cannot be produced by a human being alone; a single individual might produce an utterance containing a particular piece of information but he or she cannot contribute the element of understanding as well. This means that it always takes at least two individuals to co-produce this unity. Consequently, communication is conceptualised as an *emergent* phenomenon that arises from the *contact* between different individuals.

Luhmann goes on to explain that how a communication is understood can only be determined from communications that follow on as a reaction to the initial one, in the same way that the concrete meaning of a word in a text is only defined through the words following it in the text. Or, more to the point, the meaning of a communication is the difference that it makes in following communications. However, the difference that a communication makes for ensuing communications is not determined by the focal communication itself but by the other communications. In this sense, Luhmann speaks of communications (i.e. the meaning realised

by the communications) as the product of (other) communications and not of individuals (Luhmann 2002: 169).

On the basis of this insight, Luhmann unfolds his theory of autopoietic communication systems: every communication belongs to a *particular* communication system (i.e. a network of communications) by which it has been produced and in whose reproduction it takes part. Examples of such communication systems are organisations or face-to-face interactions. Such communication systems are *operatively* closed. By this he means that communications are *only* produced by the particular networks of communications; they cannot be imported from outside those networks. Communication processes are stimulated or triggered from outside (in this sense the system can be said to be *interactionally* open). For example, a thought in the mind of an individual might stimulate a communication, but it is the network of communication itself that, in reaction to it, produces – according to its own logic of reproduction – a particular communication. As Luhmann writes:

> The mind cannot instruct communication, because communication constructs itself. But the mind is a constant source of impulses for the one or the other turn of the operative process inherent in communication. (Luhmann, 2002: 176–177)

In other words, communication systems do react to external impulses but they react to them according to their own internal logic; external impulses might trigger certain communicative processes but they cannot determine from outside *what* internal processes are triggered. In this sense external impulses constitute merely unspecific 'perturbations' (Luhmann 1995).

Luhmann distinguishes between three types of different social systems: *organisation*, *face-to-face interaction*, and *society*. Each of these types of systems reproduces itself on the basis of a

different type of communication. *Organisation* is a social system that reproduces itself on the basis of decision communications (Luhmann 2003, 2005b). *Face-to-face* interactions are systems that reproduce themselves on the basis of communications that reflect the physical presence of the participants. Finally, s*ociety* is the all-encompassing social system that comprises all interconnected communications.

According to Luhmann we have only *one* world society (except for a handful of tiny societies that live in complete isolation from the global population, such as certain bush tribes) as all communications in the world are interconnected in some way. What is typical of the modern society is its differentiation into several functional (sub-)systems, i.e. systems that fulfil particular societal functions: e.g. the economic system, the system of science, the legal system, the political system, the system of religion and the system of education. Each of these sub-systems reproduces itself on the basis of a *particularly coded* communication; that is to say, each communication carries a particular code, which identifies that communication as belonging to a particular function system and determines what kind of meaning is being processed (Luhmann 1989). For example, the economic system processes communications that carry the code 'revenue/expense', while the legal system carries the code 'legality/illegality'. In this sense, the communications of these two systems only process meanings about revenue/expense and legality/illegality respectively. Other functional systems carry other codes, and thus process different meanings. In the following section we will elaborate on this further.

3. Science, economy and organisation as three different types of systems

In order to examine the relation between management science and management practice it is necessary to identify the relevant social systems and to analyse their different logics of

communication. Management science belongs to the functional system of science. Management practice, however, cannot be so clearly allocated to any particular functional system; 'practice' is not a system in the way that science is. What is usually referred to as 'management practice' corresponds at least to two kinds of systems: the economic system and the system of organisation. In the following we will analyse the mode of operation of these systems in more detail.

As described above, the system of science and the economic system are functional sub-systems of society. These subsystems are themselves operatively closed with regard to each other in the sense that each reproduces itself on the basis of a *particularly coded* communication. Communications within the system of science carry the code true/false (Luhmann 1989, 1990). That is to say, in order to be considered part of a 'scientific' discourse, a communication has to refer to earlier scientific communications as either true or false; and it must also be possible for ensuing communications to refer to this communication as either true or false. In this sense, the meaning of a communication within a scientific discourse is basically its truth or falsity, to which further communications can refer in order to affirm their veracity (which may then be rejected by yet further communications). One of the clearest examples of this is the tendency of scientific publications to reference other scientific publications in order to claim their own truth-value (cf. Kieser 2002: 208). Kieser explains:

> Operations of science always refer to other operations within this system. For example, a scientific publication always refers to other scientific publications – to theoretical concepts and methods it builds on and develops further. (Kieser and Wellstein 2008: 507)

Drawing on Luhmann, Nicolai writes

> Science is from this perspective a web of communications that reproduces, on the basis of scientific communication, further scientific communication in turn. (Nicolai 2004: 956)

Whether a scientific communication is classified as 'true' or 'false' is itself entirely determined by the criteria of the scientific discourse; a 'true' scientific communication, in this sense, is a communication that has been accepted by the other scientific communications as 'true' – it is a 'coded truth'.

The scientific system is operatively closed in that scientific communication is only produced by the network of other scientific communications. Scientific communication cannot draw on non-scientific communications in order to substantiate any scientific claims. For example, a communication that was substantiated with reference to a newspaper article would be considered unscientific and thus not be incorporated in the network of scientific communications. The processing of scientific communications is guided by theories and methodologies that constitute the structures (or 'programme') of the scientific system. Theories and methodologies define the 'rules' of what constitutes an acceptable scientific communication; i.e. they define how scientific communications can be related to other scientific communications, and thus, ultimately, whether or not a particular communication is treated as true or false, or whether it should be ignored as unscientific. They also determine how to construct scientific communications from empirical observations. Different theories and methodologies will lead to different scientific communications. In line with the concept of autopoiesis, the theories and methodologies are not introduced from outside but are themselves the product of scientific communications. New theories and methodologies are developed on the basis of existing theories and methodologies. Whether or not new theories and methodologies are considered true or false, and thus whether one can substantiate further

scientific communications depends, entirely on the network of scientific communications (Luhmann 1990).

As a consequence of this, scientific discourses are necessarily highly 'stylised' (Astley/Zammuto 1992); they construct abstract variables that are meaningful only in a scientific context as they have mostly very little to do with how the 'same' phenomena are treated elsewhere. An example of this is the way in which the concepts of 'performance' and 'success factors' are constructed in the management sciences (March /Sutton 1997). In addition to the construction of idiosyncratic variables, the scientific discourse forces a communication also into relating its variables to each other in an idiosyncratic manner. Thus, within the scientific discourse, a phenomenon is structured differently from the way in which it would be structured within any other discourse. To give an example, within the scientific discourse, one assumes explicitly counter-factual situations and works with *ceteris paribus* clauses. As Luhmann writes:

> The assumption of ceteris paribus is the condition of isolating the objects of research, but like the presuppositions of model-formation it is a consciously false assumption. Only through false assumptions can true knowledge be attained. (Luhmann 1989: 81)

That is to say, science structures phenomena in such a way as to render them subject to the scientific criteria that determine truth and falsity.

In contrast to the science system, the economic system is not guided by the code true/false but by that of revenue/expense – or simply payment/non-payment (Luhmann 1988, 1989). More specifically, as Luhmann explains

> By the economy we mean all those operations transacted through the payment of money. Whenever money is involved, directly or indirectly, the economy is involved regardless of who makes the payment and whose needs are affected. (Luhmann 1989: 51)

An economic communication is, for example, the placing of an order. In this case the meaning of the communication for further economic communications is not its truth or falsity but the payment associated with it. Other economic communications connect to this communication with regard to its effects on payment. The communication may be rejected by ensuing communications, if it is considered to lead to increasing expense (i.e. to be unprofitable), or, conversely, it may be accepted, if considered to lead to increasing revenues (i.e. to be profitable). Again, what qualifies as profitable/unprofitable is determined entirely by the economic discourse itself. As in the case of the scientific system, the processing of economic communications is guided by specific structures. The structures of the economic system are budgets and balances. They define the rules for economic communication and determine what money can be spent for what purposes. Again, these structures are not introduced from outside but are themselves the product of the economic communications.

The third type of system that needs to be examined is the organisation. Unlike the other two systems (science and economy), organisations belong to a type that is very different from that of functional sub-systems of society. As described above, organisations are systems that reproduce themselves on the basis of decision communications. To appreciate this it is necessary to clarify Luhmann's concept of decision (Luhmann 2000, 2005b). In contrast to other conceptualisations of decision-making in the literature, for Luhmann decisions are decision communications; it is not that decisions are first made and then communicated.

Decisions are a very peculiar form of communication: they are 'compact communications' (Luhmann 2000: 185) which communicate their own contingency. In contrast to an 'ordinary' communication, which only communicates a specific content that has been selected (e.g. 'I love you'), a decision communicates also – explicitly or implicitly – that there are alternatives that could have been selected instead (e.g. 'We are buying machine A and not machine B'). They communicate not only *what* has been decided but also *that* it has been decided. This has significant implications for the dynamics of decisions. In the transition from one decision to the next the uncertainty of the first decision situation – i.e. the uncertainty about the consequences of the given alternatives – disappears. For the second decision it is irrelevant what the initial decision situation looked like. The second decision can take the chosen alternative as a clear point of reference without having to evaluate the first decision situation; i.e., the first decision has been 'decided' and does not have to be 'decided' once more. As such, every decision makes possible extremely complex decision processes by producing stable points of reference for ensuing decisions.

As in the case of the other two systems described above, the processing of decisions is guided by particular structures, which Luhmann refers to as 'decision premises'. These decision premises define what decisions come about. There are different types of decision premises. Decision programmes or 'plans' are such an example: a strategic plan defines e.g. a general direction for future decision-making. These decision premises are, again, not introduced from outside but are the product of the organisation's decision processes. Decision premises result themselves from decision processes; e.g. strategic plans are the outcome of decision-making processes, which themselves are guided by other decision premises, such as those concerning decision-making competences (Luhmann 2005b).

The three systems that we have described (science, economy and organisation) are very different in the way they process meaning, as has hopefully become clear by now. In the following section we will examine what consequences this has for the possibilities of transferring meaning from science to 'practice'.

4. The impossibility of transfer of meaning between management science and management practice

In the literature it is usually assumed that scientific knowledge can be transferred to the domain of practice – at least in principle. From the perspective of social-systems theory this is, however, highly questionable. As we have seen in the last section, the three systems potentially involved in such a 'transfer' operate according to different logics because of which their respective communications become incommensurate.

The differences between the different communication systems become even clearer when we analyse the way they process information (Luhmann 1989; Seidl/Becker 2006). Information can generally be defined as 'a difference which makes a difference' (Bateson 1972: 315). For each of the three types of systems there is a different type of 'difference that can make a difference'. For the science system it is the difference between truth and falsity; only communications that distinguish between true/false have an information value for further scientific communications. Analogously to the way that computers can only distinguish between 0 and 1, scientific discourses only distinguish between true and false. Other distinctions have no information value – they make no difference; they are simply 'noise'. Similarly, the economic system can only process information in the form of payment/non-payment. 'True/false' as such is not a difference that makes a difference to the economic system. Organisations also process meaning in the form of decisions. Decisions can only be

substantiated by other decisions (of the same organisation) and might refer to some external sources. Ultimately, however, which external sources are drawn upon, and in what way, has to be justified by reference to decisions. The only difference that makes a difference to an organisation is the absorption of uncertainty. Whether or not something is true or false, or whether it constitutes a revenue or expense has no information value as such. What is relevant here is whether it provides a source of uncertainty absorption.

Because of their different forms of self-referential information-processing, the communications of different systems – here: science, economy and organisations – have different meanings in each system and cannot be translated into each other. Luhmann (2005a) writes that, in order to transfer a scientific communication into a different social system, it would be necessary to transfer also the entire background of theories on which the particular communication is based – and the theories on which these theories are based in their turn. In other words, it would be necessary to transfer more or less the entire scientific system into the other system. But even if this was possible, the meaning of the communication in another system would necessarily differ from its meaning in the original system, as the entire complex would be interpreted according to a different code.

Drawing on Luhmann's systems theory, Kieser and Nicolai (2004) described how the system of science constructs the problems that it analyses in a self-referential way that has very little to do with the problems faced by practitioners. This is inevitable as the problems are by definition framed differently in the domains of science and 'practice', even if scientists and practitioners cooperate. Kieser and Nicolai write:

> [T]he negotiation of a problem definition […] has to be seen as a communicative process that depends on agreeing on a specific frame of reference. In the case of science, frames of reference

> are derived from extant theories. In the case of performance studies, sometimes they are triggered by a problem that plagues practitioners – for example, by the question of whether the existence of formal procedures of strategic planning are correlated with organizational performance. Soon, however, the discussion between researchers via their publications creates new and different problems, and the problem that initiated the scientific discourse gets lost from sight. (Kieser/Nicolai 2004: 276)

Even when it is the same individuals who 'participate' in the scientific and 'practical' discourses, they cannot transfer meaning from one discourse to another; 'their' communications and actions are determined rather by the logic of the particular communication systems (Luhmann 1986). Nicolai (2004) demonstrated this impressively in his study of Porter's work, which is widely considered a prime example of applied research. Rather than crossing the boundaries of the scientific and the 'practical' discourses, the economics-based scientific parts and the 'applied' parts of Porter's work are presented more or less autonomously from each other.

Kieser and Nikolai conclude:

> In short, in discourses in which researchers try to establish the validity of theories on the basis of scientific criteria, science necessarily disconnects itself from discourses in which practitioners evaluate the usefulness of a concept. Again, the practice-oriented researcher finds himself or herself thrown back on that self-referential stream of communication that is typical for scientific discourses and is perceived as detached from the real world. (Kieser/Nicolai 2004: 277)

5. Perturbations between science and practice

As we have argued in the last section, a direct transfer of scientific results into practice is not possible due to the different logics of communication. However, this does not mean that

management science is irrelevant to management practice. Both the system of economy in general and business organisations in particular are influenced by management science. In this sense one can speak of the 'practical relevance' of science whenever science makes a difference to practice – even though it does not make the *same* difference as it makes for science itself. Hence, scientific knowledge can be said to be of relevance to business organisations if it has some relevance to decision-making, or more to the point, if it makes a difference to decision-making. This is in line with Luhmann's conceptualisation of practical relevance:

> [W]e should analyse the application of scientific results in practice not in terms of action but in terms of making decisions. It is not a question of whether something, which from a scientific point of view has been acknowledged as correct action, is reproduced correctly or not; rather the question is whether the decision situation is *modified* through the incorporation of a scientific result, which may (but doesn't have to) affect the ultimately selected alternative. (Luhmann 1993: 330. My translation; emphasis added)

The particular form of relevance for decision-making can vary. For example, scientific knowledge might contribute to defining the decision situation, deciding between alternatives or enforcing a decision. Thus, whether a scientific theory is true or not is irrelevant to 'practice'; the question is whether the referral to a particular theory helps achieve certain aims. Luhmann illustrates this with an example from psychology:

> With regard to the question of applicability it is irrelevant whether the Oedipus complex really exists; what counts is whether somebody who is skilled in identifying it is able to combine situations and therapies in a successful way. (Luhmann 1993: 323; my translation)

In contrast to conventional conceptions of the application of scientific knowledge in practice, according to which elements of meaning are simply infused into the receiving system, from the systems perspective the 'application' of such knowledge is associated with a *change of meaning*. Once knowledge is 'applied', the meaning is not the same; it is not even translated. It is simply a different meaning that is received in practice. Luhmann (1993: 327) refers to this as a 'productive misunderstanding'. Teubner explains:

> In a precise sense, interdiscursive translation is impossible. Here lies the paradox of today's babylonic language confusion. Between the discourses, the continuation of meaning is impossible and at the same time necessary. The way out of this paradox is misunderstanding. One discourse cannot but reconstruct the meaning of the other in its own terms and context and at the same time can make use of the meaning material of the other discourse as an external provocation to create internally something new. (Teubner 2000: 408)

As Teubner explains, one system cannot receive input of meaning from another system; it merely reconstructs elements of another system according to its own logic. This internal reconstruction is, however, its very own construct, which is different from the original one. Luhmann writes:

> Non-identical reproduction thus means: a change of meaning through re-contextualisation, through integration into a new neighbourhood, through triggering of different associations. Whether the infused element was true or false quickly loses its relevance. (Luhmann 1993: 330; my translation)

From this perspective, the introduction of scientific knowledge into an organisation causes within the discourse an unspecific perturbation (Teubner 2000), which elicits reactions from the system that are specific to that system. Drawing on Luhmann's systems theory, Seidl

(2007) argues that what is often described as the introduction of a new concept into an organisation is actually just the introduction of a label, the meaning of which is then constructed according to particular structures of the organisation. In other words, the organisation constructs its own meaning. Empirically, one finds that whenever organisations proclaim that they are applying new concepts – either from science or from other external systems – there are usually long discussions about how the labels associated with those concepts can be interpreted and related to existing practices (cf. Zbaracki 1998). Organisations try to make sense of the new labels on the basis of their existing discursive structures and in this way create new sense, i.e. new meaning.

Given that the economic system in general and business organisations in particular have such different modes of information processing, that they react to scientific communications at all is a phenomenon in need of explanation. Rather than being surprised at the fact that scientific results have such limited effects on other systems, one should be surprised that they affect them at all. An explanation for this is provided by the concept of 'structural coupling' (Maturana 1978; Luhmann 1995). Systems are said to be 'structurally coupled' if their respective structures are adjusted to each other in such a way as to allow systematically for mutual perturbations. Thus, structural coupling can explain why systems, despite their operative closure (i.e. in spite of the impossibility to exchange elements), remain responsive towards other systems in their environment.

The most general form of structural coupling between social systems is language. All social systems are structured in such a way as to be able to process language (Luhmann 1995). However, every social system does so in a different way. What's more, there is a particularly close structural coupling between certain areas of the sciences and other systems where they *share a particular language*. For example, in all strategy discourses – whether in the scientific

system or business organisations – one finds that more or less the same strategy language is used. Every strategy discourse can make (its own) sense of the labels ‘strategic planning’, ‘strategy review’, ‘strategic forecasting’ etc. – something that might have no meaning at all in other types of discourses. Because of that, different strategy discourses have particularly strong ‘resonance’ (Luhmann 1989) with regard to each other – where ‘resonance’ means that a system reacts to external events in accordance with its own logic (Luhmann 1989: 145).

The degree of resonance with regard to scientific communications in a particular organisation varies with the degree to which the organisation’s structures are ‘aligned’ with the structures of the scientific system. While some organisations take almost no notice of scientific results, other organisations adjust their structures explicitly to the structures of the science system. A good example of this are consulting firms, which try to stay in close ‘contact’ with the developments in management science. In other words, they couple themselves structurally to the system of science. Because of that, new developments in management science have a particular resonance in many consulting firms; i.e. such developments can be seen as a difference that makes a difference to consulting firms, even though – this needs to be stressed again – each consulting firm determines by itself *what* difference this makes. Often this might amount to no more than using a particular scientific label to enforce a particular decision (Kieser 2002).

Apart from coupling themselves structurally to the system of science, consulting firms often also function as means of structural coupling between science and other organisations. Thus, not only do the consulting firms possess resonance with particular developments in science but they can also serve as a means of creating resonance within other organisations. This is the case if organisations couple themselves structurally – as clients – to consulting firms (on the consultant–client relation see Luhmann 2005a; Mohe/Seidl 2007) that are themselves

coupled to the scientific system. In this way certain scientific findings, e.g. the identification of a new 'success factor' in science, might have some resonance in the consulting firm in the sense that the firm changes its concepts of consulting, which might have an effect on what perturbation these concepts cause in the client. Such effects might take different forms, and consist in something as simple as e.g. the adoption of new scientific labels that are (re-)constructed by the consultants and clients respectively.

What meaning is ultimately created within a particular organisation in reaction to the introduction of a new label is not completely random. Rather, the particular communicative context, i.e. the particular structures of communication into which the new labels become embedded, restrict the range of possible meanings that may be attached to the labels. This is particularly the case where there is a whole set of labels to accommodate. In these cases the interpretation of every individual label has to fit with the interpretation of the other labels – unless, that is, one only selectively draws on individual labels (cf. Zbaracki 1998).

It is impossible to determine from the outset what meaning will ultimately be created in response to a perturbation from the scientific system. As Teubner writes:

> There is of course, no built-in guarantee that such a misunderstanding will be productive. You cannot say in advance whether in the famous shell, the irritation of the [grain of sand] will at the end create the pearl. (Teubner 2000: 409)

In some cases organisations might accomplish a fundamental change. In other cases the ongoing practical discourses might hardly be affected: the organisation might use the new labels but without really changing its structures of communication. There are many empirical accounts in the management literature of such instances of pure re-labelling (e.g. Ashforth and

Gibbs 1990; Brunsson and Olsen 1993). While this is often portrayed as intentional deception, there are many cases where it is assumed by the organisation itself that the organisational practices have been changed: through the new labels, the organisational reality is experienced differently, even if it has not changed in any 'substantial' way.

The system-specific re-invention of a scientific concept is, however, only possible if the organisation finds some point of connection between its existing interpretational context and the label. That is, the different labels and sub-labels in some way or other must be open to being interpreted according to the existing interpretational context: the labels need 'interpretive viability' (Benders and Van Veen 2001), i.e. they have to leave scope for interpretation. Several authors have commented on the ambiguity and vagueness of scientific concepts or labels that are used in practice (e.g. Kieser 2002; Ortmann/Salzmann 2002; Nicolai 2004). While some authors see this ambiguity fairly critically, other authors have pointed out – in accordance with our systems-theoretical perspective – that only by being ambiguous and vague is there a chance of such concepts/labels being able to be made to 'fit' the concrete organisational context. Astley and Zammuto write in this respect:

> Linguistic ambiguity […] gives conceptual terminology great flexibility of application, allowing words to take on new meanings in the context of a different language game. (Astley and Zammuto 1992: 453; emphasis added)

Ambiguity allows the organisation to project the decision problems it encounters into a concept and thus interpret it as the solution to these pressing problems (Kieser 1997: 59; Kieser and Wellstein 2008)

While in principle any scientific communication can have practical implications if the economic system or the business organisations react to them, the likelihood of causing such resonance can also be influenced by the scientific system. In line with this, Luhmann (1993) suggests conceptualising 'applied science' as a science that contemplates, and tries to increase its potential for causing perturbations in practice. This contrasts with the widely held concept of 'applied science' as a science whose findings are transferred into practice – which is impossible in principle. In other words, the scientific discourse might reflect on its potential for stimulating parallel processes in the practical discourse; for stimulating, that is, productive misunderstandings. This reflection can focus on the aspect of content or process. With respect to content, science might, for example, try to develop labels that are likely to have resonance also in the practical discourse. With respect to process, one might try to ensure that the process of research comes into 'contact' with management practice. This might take, for instance, the form of the so-called 'mode 2 management research' (e.g. Gibbons et al. 1994). However, in contrast to the usual interpretation, 'mode 2' would have to be understood as a parallel processing of separate discourses: the scientific discourse and the practical discourse take place at the same time, with the 'same' communications meaning different things in the different discourses.

6. Conclusion: implications for research policy

In this chapter we tried to demonstrate the potential of Luhmann's theory of autopoietic social systems for illuminating the relation between management science and management practice. For this purpose we first introduced Luhmann's concept of social systems as operatively closed systems of communication. According to this view, science constitutes a particular system that is characterised by a particular logic of communication that differs fundamentally from that of the systems of 'practice' – in this case: the economic system in general and business organisations in particular. Due to their different logics, scientific results cannot be

transferred to the other systems. However, this doesn't mean that science has no impact at all on practice: science can cause 'perturbations' in other systems, which might change those systems' structures. We argued that whether science can have such an effect depends on the structures of the relevant systems.

With regard to the current debate on the practical irrelevance of management science (e.g. Rynes et al. 2001; Baldridge et al. 2004; Van de Ven/Johnson 2006) this has important implications: from this systems-theoretical perspective, the lack of practical relevance needs to be understood not as a deficiency of the particular research but as an inevitable consequence of the incommensurability between the different discourses. In a strict sense, we might thus only speak of the relevance or irrelevance of research to further research – but not to practice. The implication of this is twofold: on the one hand, management research has to acknowledge its self-referentiality as constitutive. That is to say, management science – like all science – only progresses by focusing on the scientific discourse (cf. Kieser 2002; Kieser and Leiner 2009; Nicolai 2004). Thus, the 'difference' or 'gap' between management science and management practice, which has been deplored by so many management scholars as a problem that needs to be done away with, has to be appreciated as the *sine qua non* without which management science cannot constitute a science at all. If management science were adjusted to the logic of management practice, it would no longer constitute a science but simply be another form of management practice (Luhmann 1994; Kieser 2002).

On the other hand, the scientific discourse could take into account that it has the potential to have resonance in the practical management discourses and thus constitute a fruitful source of perturbation (Astley and Zammuto 1992; Luhmann 1994; Seidl 2007). As such, management science could try to increase its potential for having some resonance in management practice. However, there are two dangers: first, due to the different logics of the science system and the

receiving systems, the former has no control over its effect on the latter; the perturbation might prove detrimental. In this respect, science one can only try to draw the attention of the receiving system to the fact that it is the receiving system itself that determines the effect of the scientific perturbation. Thus, science cannot be blamed for any detrimental effects that its concepts might have in practice.

Second, if management research focuses too much on its effect on practice, it might lose its connectivity to other scientific communications; i.e. it might become disconnected from the network of scientific communications and thus no longer constitute an element of the scientific system (Luhmann 1994; Kieser 2002). In this respect, science might reflect on its own orientation with regard to internal and external 'audiences' and try to strike some sort of balance. There are numerous examples of such reflections taking place in management science – this paper is an example of that.

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