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The value of theoretical multiplicity for steering transitions towards sustainability

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Abstract

Transition management, as a theory of directing structural societal changes towards sustainable system innovations, has become a major topic in scientific research over the last years. In this paper we focus on the question how transitions towards sustainability can be steered, governed or managed, in particular by governmental actors. We suggest an approach of theoretical multiplicity, arguing that multiple theories will be needed simultaneously for dealing with the complex societal sustainability issues. Therefore, we address the steering question by theoretically comparing transition management theory to a number of related theories on societal change and intervention, such as multi-actor collaboration, network governance, configuration management, policy agenda setting, and adaptive management. We conclude that these related theories put the managerial assumptions of transition management into perspective, by adding other steering roles and leadership mechanisms to the picture. Finally we argue that new modes of steering inevitable have consequences for the actual governance institutions. New ways of governing change ask for change within governance systems itself and vice versa. Our argument for theoretical multiplicity implicates the development of multiple, potentially conflicting, governance capacities.

Keywords

transition, governance, theoretical multiplicity, change, governance capacity

1 Introduction

Transition and transition management (Kemp, Loorbach, & Rotmans, 2007; Loorbach & Rotmans, 2006; Rotmans, Kemp, & van Asselt, 2001, p.: 451) proved to be attractive concepts for inducing sustainability and have become a major topic in scientific research. The growing recognition of the inter-related nature of contemporary societal problems and the call for fresh approaches and forms of governance has contributed to the rise of the concept (Shove & Walker, 2007). In the Netherlands, transition management (Rotmans, et al., 2001) even became adopted as a guiding principle for public policy. Transitions are defined as a gradual process of change where the structural character of a societal domain transforms (Rotmans, et al., 2001). Transition management aims at influencing the direction and pace of transitions towards a more sustainable society

(Loorbach & Rotmans, 2006). The recently burgeoning literature on transitions and the adoption of transition management by government agencies testifies the influence of the concept. Scholars and practitioners have been developing different frameworks to steer or to facilitate transitions towards more sustainable futures. However, interventions to initiate, steer or manage transitions are not always as effective as hoped for.

In this paper we focus on the question how and to what extent transitions can be influenced or managed, in particular by governmental actors (building on Dewulf, Termeer, Werkman, Breeman, & Poppe, 2009, in press; Dewulf, Termeer, Werkman, & Breeman, 2008; Termeer & Dewulf, 2009). We analyze this question theoretically by discussing a range of related theories of social change and intervention. In doing so, we follow up on the argument for avoiding to consider transition management "as the only model in town, and for exploring other social scientific, but also systemic theories of change" (Shove & Walker, 2007: 768). In the first section we will discuss theories of multi-actor collaboration, network governance, configuration management, policy agenda setting, and adaptive governance, and the relation of these theories to transition management. In the second section we systematically compare these theories by presenting and discussing a table where key features of all treated theories are assessed. From this selective comparison, we argue that these related theories put the managerial assumptions of transition management into perspective, by adding other steering roles and leadership mechanisms to the picture.

In the third section we formulate our conclusions regarding transition management as a theory of social change and intervention. Where transition management tries to overarch a lot of diversities in one theory we suggest an approach of theoretical multiplicity for dealing with the enormous challenge of sustainability. Finally we address the question of change within the governance systems itself. All these theories put forward new modes of governing, steering and leadership. However, implementing new governing strategies is difficult, above all when they conflict with the rules and beliefs of existing governance institutions. We argue that changing existing governance systems may be necessary to enable new ways of governing change.

2 Transition management and other approaches governing change

In this overview, we are necessarily selective. In the choice of approaches to discuss we opted for theories that share some basic features with transition management, especially the focus on change and innovation, and their relevance for sustainability issues, but which diverge from transition management in some other relevant respects. Because we try to capture the core ideas of these theories, we rely on a limited number of representative publications. These are not always the most recent publications, because recent publications about these theories often involve attempts to incorporate elements from the other discussed theories and thus provide a less clear picture of the distinctive contributions of each theory. In each of the subsections, we will first shortly summarize these theories. Attention will be paid to the analytical framework to conceptualize change and interventions, and the role of governmental actors or change agents. To clarify our point of reference about transition management we start with summarizing important aspects of transitions and transition management based on three core publications (Kemp, et al., 2007; Loorbach & Rotmans, 2006; Rotmans, et al., 2001).

2.1 Transition management

Basic assumption underlying the transition model is the diagnosis that environmental problems are not caused by clearly identifiable actors or factors but by failures of a systemic nature. As most policy strategies are not able to tackle system failures, they will only lead to suboptimal solutions (Kemp, et al., 2007). “Sustainable development requires structural changes in social-technical systems and wider societal change, in beliefs, values and governance that co-evolve with technology changes” (Kemp, et al., 2007: 78). Transitions are linked up with system innovations (Loorbach & Rotmans, 2006), which are much broader than just technological innovations, because the current societal regime is supposed to change. The co-evolution of a set of slow changes can form the undercurrent for a fundamental change. Transition processes involve multiple actors within a societal subsystem and fundamentally change both the structure of the system and the relation among the actors.

Transitions are not linear processes, but involve a shift in the system from one dynamic equilibrium to another, over four consecutive phases (Loorbach & Rotmans, 2006; Rotmans, et al., 2001):

- A *predevelopment* phase of dynamic equilibrium where there is very little visible change at the systems level but a great deal of experimentation at the individual level.
- A *take-off* phase where the process of change gets under way because the state of the system begins to shift because of different reinforcing innovations or surprises.
- An *acceleration* phase where visible structural changes take place through an accumulation of socio-cultural, economic, ecological, and institutional changes.
- A *stabilization* phase where the speed of social change decreases and a new dynamic equilibrium is reached.

The promise of this transition approach lies in the idea that transitions can somehow be steered or managed: “Although transitions cannot be managed in terms of command and control, they can be managed in terms of influencing and adjusting: a more subtle, evolutionary way of steering. In other words, the direction and pace of transitions can be influenced, even if not controlled directly. Transition management therefore aims to better organize and coordinate transition processes at a societal level, and tries to steer them in a sustainable direction” (Loorbach & Rotmans, 2006: 5). Transition management thus deliberately attempts to steer transitions towards a more sustainable future. Core elements of organizing transition processes are transition arenas, agendas and goals, the fostering of networks and learning processes. Transition arenas are “networks of innovators and visionaries that develop long-term visions and images that, in turn, are the basis for the development of transition-agendas and transition-experiments, involving growing numbers of actors” (Loorbach & Rotmans, 2006: 9). A transition manager is expected to bring the parties together, keep an overview and mediate where necessary. Governmental actors can fulfill the function of transition manager, with different roles in different transition phases. In the predevelopment stage, for example, there is a need for social experimentation and creating support for a transition programme (Loorbach & Rotmans, 2006), while in the acceleration phase there is a special need for controlling the side-effects of large-scale applications of new technologies. Facilitation at both the process (learning, communication) and content level (feeding new information and setting sustainability objectives) is needed (Rotmans et al., 2001). The government’s role is thus plural. On the one hand, state actors are called upon to steer transition whilst, on the other hand, they need to facilitate and evaluate procedures that mobilize and engage actors.

2.2 Multi-actor collaboration

Multi-actor collaboration theory (Gray, 1989; Huxham & Vangen, 2005) addresses cooperation and negotiation between multiple interdependent actors in the context of a 'wicked' problem domain in which they all have a stake, like environmental pollution, city regeneration or water management. Ouchi (1980) differentiates this concept from other kinds of relationships like market or hierarchically regulated relationships. Gray (1989) defines collaboration as "a process through which parties who see different aspects of a problem can constructively explore their differences and search for solutions that go beyond their own limited vision of what is possible" (p. 5). Stakeholders include all individuals, groups or organizations that are directly concerned by actions taken by others to solve the problem. A stepwise process is proposed for collaboration initiatives, which includes: 1. problem setting (culminating in a shared appreciation of the complex problem domain), 2. direction setting (culminating in a negotiated agreement) and 3. implementation (culminating in tangible actions and changes) as main phases.

Getting the necessary actors together and creating awareness of their interdependencies is considered crucial for obtaining leverage to effectively deal with wicked problem domains. One of the involved persons or organizations usually functions as a *convener* who brings the parties together. Given that wicked problem domains usually defy unilateral intervention, the convenor is very much dependent on other actors to bring about any change in the collaboration or problem domain.

With multi-actor collaboration (Gray, 1989; Huxham & Vangen, 2005), transition management shares a focus on multiple actors and on crossing the boundaries of different policy domains or sectors. Both theories also coincide on the search for innovative solutions based on the variety of knowledge and perspectives that the involved actors bring to the table. Transition management takes a more selective approach to involving actors by focusing on innovators (niche players) and visionaries, whereas multi-actor collaboration theory would deliberately try to get the 'whole system in the room', involving also those actors who oppose the innovations championed by the visionaries. What gets more attention in multi-actor collaboration theory is the negotiated nature of the framing of the problem domain itself (Dewulf, Craps, & Dercon, 2004). Defining the initial idea that transition rather than stability should be strived for, setting sustainability as a broad ultimate goal and defining the boundaries of the system to be changed are all potentially contentious issues. Transition management also takes a longer term perspective (25 to 50 years) as the relevant time frame for social change, while collaboration theory pragmatically focuses on reaching an agreement and effectuating a change in a few years time.

Whereas multi-actor collaboration theory speaks of *conveners* with a precarious leadership position, transition management assumes a presumably external (governmental) *transition manager* who steers the transition from an overview position. Leadership in multi-actor situations comes in different shapes: through leadership *media* such as membership structures, specific work processes and participants' power and know how (Huxham & Vangen, 2000). None of these leadership media is wholly within the control of the members of a collaboration, echoing one of the principles of the theory of collaborative advantage: assume that no one is in control and that partners and environment are continually changing (Huxham & Vangen, 2005).

2.3 Network governance

Network governance refers to theories that take into account the interdependencies of public, private and semi-private actors in self-organizing networks (Klijn & Koppenjan, 2000). The

theoretical shift from ‘government’ to ‘governance’ indicates a shift from hierarchical and well institutionalized forms of government towards less formalized, interactive forms of governance in which state authority makes way for an appreciation of mutual interdependence with different stakeholders. Core concepts are network management, self governance, deliberative policy making and stakeholder dialogues.

Rooted in the network approach to policy (Klijn & Koppenjan, 2000), network management focuses on mediating and co-ordinating policy making in policy networks. Two types of network management strategies can be distinguished: *process management*, focused on improving the interaction between actors by seeking convergence of perceptions, creating temporary organizational arrangements and managing conflict; and *network constitution*, focused on changing the institutional characteristics of the network, by changing the actor constellation, changing the network rules or reframing ideas about the functioning and the substantive problems of the network.

Governmental actors have multiple options when confronted with network-like situations (Klijn & Koppenjan, 2000): (1) not joining in network games and trying to unilaterally impose their ideas and goals; (2) co-operating as a partner in networks with other public, semi-public and private actors; (3) taking up the role of process manager and facilitating interaction processes in networks; or (4) taking up the role of network builder, for which governments, with their special resources, are well suited.

Network governance shares with transition management a focus on less formalized, interactive forms of governance. Network governance focuses primarily on actors who are already included in policy networks, while transition management focuses on actors in innovative niches and tries to use this marginal position to foster radical innovation. The network manager bears some resemblance to the transition manager, but steering takes more varied forms in network governance, ranging from network building over process management (Klijn & Koppenjan, 2000) to unilateral interventions in networks (de Bruijn, 2005), rather than the external overarching position assumed by transition management. Network theory also pays more attention to multiple, partially overlapping or disconnected, decision making arenas, and to the different roles that governmental actors can take up (Klijn & Koppenjan, 2000; Termeer, 2007). As network theory has been developed within the domain of public management, political aspects such as the use of power and the position of politicians in networks gain special attention.

2.4 Configuration management

Configuration management is rooted in social-cognitive approaches, in which any social phenomenon is considered as a social construct. This also implies that it can be changed and reconstructed in communication and acting (Berger & Luckmann, 1966; Chia, 1996; Gergen, 1999; Hosking, 2002). One of these approaches is the configuration approach (Van Dongen, De Laat, & Maas, 1996; Van Twist & Termeer, 1991; Voogt, 1991). Core concepts in this approach are sensemaking, configurations and fixations.

People are continuously involved in sensemaking processes with other people. By constructing stories with others, actors make sense, to themselves and others, of their actions. The concept of configurations is used to describe patterns that emerge in these social processes of sensemaking. A social-cognitive configuration is characterized by a group of people with an intensive interaction pattern, agreed upon interaction rules and shared meanings (van Dongen, de Laat & Maas, 1996). Configurations arise because people not only develop shared meanings in interactions but also often lean towards people with similar meanings. It is a causal circular process in which a group of people (a social structure) produces content (a cognitive structure) and vice versa content produces a group.

Dynamics arise through the confrontation with other realities, people or interaction-rules. At the same time, the process has the tendency to stagnate. Whenever people talk above all with people who have similar realities and only assign meanings in those interactions, the configuration closes. Configuration management includes two strategies. The strategy of *development* is aimed at preventing exclusion of people, meanings and game rules. Phrased in positive terms this is about creating conditions for effective learning processes that enable people to connect with their surroundings in a varied way. A lot of meaning is attributed to the strategy of development because smothering variation is easier than creating it again. There are various strategies for development, such as encouraging reflection, making conflicts productive, seizing dynamics or creating a common language (Termeer, 1993). However, these strategies are only meaningful if there is willingness and the opportunity to develop and to learn. This is not the case in many situations. In those situations you have fixations. Symptoms of fixations can be the presence of taboos, repetition of moves, vicious circles, exasperating delays or an escalated conflict. Variety is excluded: "This is how it is", or "That's how we do it and that's final". At the moment that fixations form a blockade to further developments, other intervention strategies are needed. It is possible to distinguish between social and cognitive fixations. With cognitive fixations, the meanings are declared to be unchangeable and nonnegotiable whereas with social fixation it is no longer possible to reflect on the people participating and on the interaction rules. Interventions following the principle of context variation are aimed at unblocking stagnations in order to revitalize processes of learning (Voogt, 1991). Hence, with cognitive fixation, the intervention is aimed at new actors or new interaction rules, and with social fixations contributing new contents is an adequate strategy (Termeer & Koppenjan, 1997). Context variation is counter-intuitive for many people because many interventions are aimed precisely at underlining the things that are locked in. Basic assumption underlying configuration management is that change is continuous and emergent. Contradictory to transition management, it believes that numerous small adaptations can cumulate and amplify in real system innovation. Configuration management seizes existing dynamics and expects little good from applying change from the outside through influencing people and through that, their meaning constructions and actions. Furthermore, configuration management explicitly pays attention to interventions in cases of deadlocked processes and to precise diagnosis. Before setting up transition arena's, existing stagnations should be diagnosed by asking questions such as: what causes changes in dynamic sectors to stagnate, what were the reasons for excluding variation temporarily and what causes the connections with various social configurations to collapse? In other words: how did it come to the point that transition arena's are necessary?

2.5 Policy agenda setting

Theories of agenda setting focus on the politics of attention for policy issues and the concomitant punctuated equilibrium dynamics of policy change. Punctuated-equilibrium theory tries to explain the pattern of policy stability (or small incremental changes), which are occasionally interrupted by abrupt major policy changes (True, Jones, & Baumgartner, 2007). Policy is executed by a small number of officials, experts, and stakeholders, working together in a small network of various (public) organisations; sometimes referred to as a policy community. Agenda setting theory suggests that many policy domains have low political attention because politicians have a limited amount of time and resources, and hence must set priorities. So called *focusing events*, like a crisis or big organisational failure, can heighten media and political attention for a specific issue and create *windows of opportunities* for policy entrepreneurs to change policies (Kingdon, 2002). If certain issues rise to the top of the media agenda pressure on politics increases to take action, and new actors may be mobilized to attack current policies. Once the policy is changed, or other issues

have captured the attention of media and politics, the policy is likely to been drawn back into a new period of stability and incremental adjustments.

Transition management and agenda-setting theory have some important features in common. In agenda-setting theory, agendas are created in different places, such as in the parliamentary arena and in the media; also do agendas come about on various different levels: on the national level, the European or the local level. All these different meeting places in which agendas are moulded are referred to as policy venues. They resemble the transition arenas, as described above, albeit that the transitional arena focuses on the entire transition process, whereas the policy venue is somewhat limited in its scope, focusing on the agenda stage only. However, both theories are multi-level and multi-actor. Another important feature in agenda setting theory is the concept of policy image, which bears some resemblance with the transition image. A policy image refers to the way a problem is framed. It connects different concepts and recreates the problem in such a way that media and politicians take the issue into concern. The policy entrepreneur, who connects a policy frame to his favourable outcome and is able to insert it into the right policy venue, is likely to turn matters to his advantage. This is different from the transition manager who keeps a more distant stance to the actual transition, overviewing and guiding the entire process for a longer period of time. Both approaches share the systemic ideas about non-linear changes in the form of alternating punctuated equilibriums, although agenda setting theory suggests shorter time frames for policy punctuations than transition management. Agenda setting theory also stresses the largely unpredictable nature of punctuations, while transition management somehow assumes that attention can remain focused on the transition issue as long as an entire generation. However, both theories suggest an s-curve development of the actual change.

2.6 Adaptive management

Adaptive management can be defined as “a systematic process for improving management policies and practices by learning from the outcomes of management strategies that have already been implemented” (Pahl-Wostl, et al., 2007: 4). Adaptive management (Folke, Hahn, Olssen, & Norberg, 2005)assumes a world that changes continuously in unpredictable directions. These changes can be gradual, but abrupt or turbulent changes tend to become more prominent. In turbulent change episodes, available experience and expertise often proves to be incomplete, consequences of action are unclear, and the future of the system is uncertain. Vulnerable ecosystems, for example, can rapidly shift into undesired states and stop providing ecosystem services (like food or scenery) to society. Similarly, social-ecological systems can loose their resilience to keep fulfilling basic functions in conditions of change or disturbance. In this sense, adaptive management pays attention to both ‘change as growth’ and ‘change as destruction’. The panarchy concept (Gunderson & Holling, 2002) connects both aspects into one ∞-shaped iterative cycle, consisting of exploitation, conservation, release and reorganization phases. The S-shaped curve of transition management can be read into this cycle as the exploitation and conservation phases (the growth aspect of change).

Attempts at managing or steering have to take into account uncertainties and both gradual and abrupt changes. Therefore, learning plays a central role in adaptive management, as a way of keeping knowledge up-to-date with continuously changing conditions. Social networks and social memory are considered important bases for building and maintaining the capacity to learn (Folke, Hahn, Olsson, & Norberg, 2005). Combining different types of knowledge (scientific, professional, experiential, indigenous, etc.) is an important feature of this learning. Learning is not a goal in itself but serves to adapt management strategies and policies as changing conditions require. As not all

uncertainties can be ‘learned away’, another focus in adaptive management is on devising measures or strategies that are robust (stay functional under a range of different scenarios) or flexible (can be adjusted as needed or applied only when necessary). This often requires some redundancy in the system, e.g. in the form of polycentric institutional arrangements, with nested quasi-autonomous decision-making units operating at multiple scales (Folke, Hahn, Olsson, et al., 2005). To be able to mobilize and link the necessary actors and knowledge quickly and effectively, bridging organizations (between scientists and policy makers, between actors, between networks, between levels, …) are suggested, as well as the creation of conditions for self-organization through enabling legislation and policies. In sum, critical factors for adaptive management include learning to live with change and uncertainty, combining different types of knowledge for learning, creating opportunity for self-organization and nurturing sources of resilience for renewal and reorganization (Folke, Hahn, Olsson, et al., 2005).

Leadership plays an important role in adaptive governance networks by providing key functions, such as “building trust, making sense, managing conflict, linking actors, initiating partnership among actor groups, compiling and generating knowledge, and mobilizing broad support for change” (Folke, Hahn, Olsson, et al., 2005: 451). Important as this leadership may be in steering adaptive management, it does not involve a position like ‘adaptive manager’. Apart from leaders, bridging organizations fulfil an important role in directing adaptive management efforts.

3 Comparing multiple approaches to social change and intervention for sustainability

Our search for theories implicitly or explicitly related to transition management resulted in a whole range of paradigms, concepts, methods and tools. Of course, the overview is not complete. The list of relevant theories could be expanded with concepts such as soft systems theory, innovation literature, cultural theory or economics amongst others. Because transition management is both a field of research and a field of practice, it continues to grow and to develop rapidly.

In the following table we compare the theories on a number of aspects (the columns of the table) to summarize differences and similarities. The theories make different assumptions about the *nature of change*: what is it that changes and in what direction. They variously focus on change in a societal domain or change in policy, or the relation between both. Differences are also apparent in assessing when change has occurred. Is it about changes in understandings, networks, structures, technologies, policies, markets, problem domains or entire societal domains? The change can be directed towards structuring an under-organized domain or towards changing existing structures. Transition management is among the more ambitious theories, focusing on structural changes in entire societal domains.

Conceptualizations of the *change trajectories* vary in their focus on short term versus long term changes, and assumptions about the continuous (change happens all the time) versus episodic (change comes in big shocks) unfolding of change (Weick & Quinn, 1999). Transition management focuses on long term changes (one or more generations), with gradual or continuous changes in the first phases, episodic change in the acceleration phase, and again more gradual changes in the stabilization phase. Configuration management explicitly pays attention to revitalizing processes in cases of resistance and stagnation.

Theories focus on different *main actors*, playing different roles, and standing in different *relations* to each other. The actors that are portrayed as the crucial ones in the different theories can be roughly classified as policy actors, business actors, societal actors, science actors or a combination of these. Transition management distinguishes itself by addressing a broad range of actors. The

range of roles that actors play includes innovator, manager, entrepreneur, user/employee, policy maker, politician, gatekeeper, facilitator and expert. The relationship between actors is also conceptualized in different ways, in terms of competition (multiple actors competing for attention in agenda setting theory, or competing technological niches in transition management) or mutual interdependency (most of the other theories) (Powell, 1990). With multi-actor collaboration, transition management shares the idea of bypassing. Change trajectories are organized outside the standing organisations, drawing a distinction between actors in the centre of change (the innovators or negotiators) and actors in the margin. Policy agenda setting and network governance theories explicitly focus on actors hindering change, like gatekeepers or actors using blocking power. Transition management mentions the dominant regime as resisting change, but simultaneously assumes that important governmental actors (supposedly part of the current regime) have to pave for the transition to a new regime.

Steering or influencing concepts are based on assumptions about how people or things change. In blue print approaches of change, for example, it is assumed that people change if clearly specified results are laid down beforehand and incentives (or punishments) are sufficient (De Caluwé & Vermaak, 2004). Transition management is not explicit in this respect, but we infer the assumption that people can really innovate and induce system innovations when actions are coordinated in the right settings. Transition management also reflects confidence in the potential of new technologies to reach a sustainable society, provided that they become part of new dominant technological regimes. Assumptions from other theories are that people change when interests are integrated in win-win situations, when they are encouraged and motivated, when they interact and learn or when space exists for spontaneous adaptation.

The prominent figures in steering change range from facilitators who limit their influence to the process (e.g. possible facilitators in multi-actor collaboration or adaptive governance), over entrepreneurs (e.g. the convener as a social entrepreneur in multi-actor collaboration, or the policy entrepreneur in punctuated policy change, or the technical entrepreneur with an innovative idea in transition management), to managerial figures (e.g. transition manager or network manager). Most approaches consider governmental actors as possible incumbents of these leading roles, though in different degrees. Apart from the hierarchical role in the blueprint approach to policy, government can act as facilitator, as one of multiple change agents or as (network) manager of the change process. However configuration management stresses that public leaders can only intervene in deadlocks when they are not part of stagnated patterns themselves. In some of the approaches the government appears in the possible role of taking part as one actor amongst others, like in multi-actor collaboration, network governance or configuration management. This allows for varieties of self-organisation where societal change can very well occur without the involvement of governmental actors.

Table 1. Transition management and other theories of change and intervention

	Nature of change	Change trajectory	Main actors	Relationship between actors	Steering/ influencing	Leading figures	Role for government	Success
Transition management	Long term structural change of a societal domain	S-shaped curve, with pre-development, take-off, acceleration and stabilization phases, over the course of an entire generation	Regime players and niche players (innovators) Public authorities	Conflictive and competitive on the short term, shared long term goal of sustainability	Creating transition arenas, starting transition experiments Niche management	Transition manager Visionary innovators	Transition manager, creating support and conditions for a transition programme	More sustainable societal domain
Multi-actor collaboration	Negotiated structuration of an under-organized problem domain	Stepwise exploration negotiation and implementation over a number of years	Representatives of organizations having a stake in the problem domain	Interdependent, conflictive/ collaborative	Leadership through participants, processes and structures. No one is in control	Convener	None, convener or participant	Negotiated agreement (win-win) on the future direction of a problem domain
Network governance	Change in policy and/or change in policy networks	Policy games in successive rounds in policy networks	Public and private actors linked in networks, supporting or hindering policy strategies	Sustainable interdependencies between actors, engaged in overlapping policy networks	Providing incentives for co-operation, process management, network constitution,	Network manager or process manager	Partner, process manager, network builder or staying out	Win-win situations Enriched chance of policy implementation Democracy
Configuration management	Evolving interaction between relations and contents in social-cognitive configurations	Continuous change, numerous small adaptations can cumulate and amplify	People, departments or organizations	Centrally, peripherally or multiple included in evolving social-cognitive configurations	Enhancing continuous learning or revitalizing stagnations	Configuration change agent	Member, change agent, network builder or staying out	Improvement of continuous adaptation
Policy agenda setting theory	Change in policy input, agenda and output	Incremental changes punctuated by abrupt and large policy change	Politicians, administrators, media, interest organisations	Competitors and allies for attention on the policy agenda	Using windows of opportunity, inserting policy images in policy venues	Policy entrepreneur	Policy entrepreneur, responsive to societal or political demands	New agenda for policy
Adaptive governance	Adaptation to the changing conditions in social-ecological systems	Dealing with gradual and abrupt changes through close monitoring and learning	Scientists, policy makers, ngo's	In need of each other's knowledge, jointly adapting to changing circumstances	Bridging science and policy, bridging networks of actors	Adaptive network leaders, bridging organizations	One of the multiple decision units	Social-ecological system keeps fulfilling basic functions

From a case study on the development of the energy producing greenhouse (Termeer & Dewulf, 2009), different pictures of steering emerged from applying these multiple theoretical lenses to a case. The technological entrepreneurs in the case seemed to assume diffusion on the condition that the technology is well developed. Network governance puts the attention on how existing networks are activated and new networks are formed, by pulling strings both publicly and behind the scenes. Policy agenda setting emphasizes the steering potential of being prepared to jump in when a window of opportunity emerges in an otherwise pretty unpredictable policy process. Multi-actor collaboration emphasizes the steering potential of bringing important parties around the negotiation table and pragmatically addressing those issues which are of common concern. Adaptive governance emphasizes the ubiquity of slow and abrupt changes, and the potential of linking and adjusting these ongoing change processes. The case illustration also puts the managerial assumptions of transition management into perspective, by adding other steering roles and leadership mechanisms to the picture. Some were deliberate attempts at steering at the time, while others can only be identified as steering roles in retrospect. Some of the steering roles are open and visible, while others are accomplished behind the scenes. Some steering roles target a small part of the system, while others aim to influence the whole system, etc. The multiple theory analysis of the greenhouse case revealed more and more varied steering moments and roles than could transition theory alone – or any other single theory for that matter.

4 Theoretical multiplicity

Comparing transition management with other theoretical approaches to societal change and intervention, what strikes us is the attempt to incorporate a very wide range of aspects into a single theory. Where other approaches to complex societal problems are more inclined to make a choice when faced with the recurring dilemma's that complicate every attempt at societal steering, the answer of transition management mostly consists of embracing both sides of the dilemma. Transition management addresses multiple actors (many actors needed who often maintain a conflictive relation), multiple sectors (system innovations affect multiple sectors), multiple levels (co-evolution of developments at niche, regime and landscape level), multiple time scales (from short to very long term orientation), multiple objectives (maintain multiple images of the future), and multiple options (keeping options open by developing multiple innovative niches).

In this manner, transition management tries to integrate a broad range of varieties into a single theory, thereby drawing upon concepts and methods from the other theories we discussed. It is not very clear within transition management theory how this variety needs to be handled. A lot more theory and practice seem to be needed to face the enormous challenge to overarch all this multiplicity. Therefore a paradoxical aspect lies in the very attempt to integrate everything into one theory. Another option, which we would like to put forward, is an approach that rests on the multiplicity of theories. The basic argument is that multiple theories (the ones we discussed here and others) will continue to be needed simultaneously for dealing with the complex societal sustainability issues. Only variety beats variety, also at the level of theories, which can serve as a box of conceptual tools to analyse situations and to design interventions. This does not mean that each of the theories should proceed as if the others did not exist. In fact, by writing this paper we are assuming that it is worthwhile to compare theories and to look for points of connection and difference. This approach can be understood as a meta-paradigmatic approach (Gioia & Pitre, 1990), which recognizes the value of the distinctiveness of each individual theory and the value of exploring zones where theories overlap or can inform each other, but does not try to integrate everything into one paradigm.

This has implications for the question we started this chapter with, namely if and how transitions can be managed or steered. A distinctive trait of transition management appears to be the assumption of an overarching position of (governmental) transition managers who can apply management tools, niche-building machinery, and engineering devices from a privileged, knowledgeable and external position (Shove & Walker, 2007), towards a clear and one-dimensional target. As we have shown, quite different assumptions on this issue appear in related theories. Any transition management arena, however, is likely to be only one of the arenas where sustainability-relevant issues are discussed or sustainability-related decisions are taken, and the sustainability issue at hand may get framed quite differently in those other arenas. Also in transition management, "steering for sustainability typically surfaces as isolated moments of reflexivity amid a sea of everyday politics" (Hendriks & Grin, 2007: 334).In the next section, we will argue that the theories discussed in this paper can be conceived as new governance concepts which relate to distinct, sometimes conflicting, governance capacities. We ask what kind of changes in governance systems would be required to enable the new ways of governing change we discussed in this paper. We argue that theoretical multiplicity implicates multiple governance capacities which can be developed to govern change towards a more sustainable society.

5 Changing governance capacities for governing change towards sustainability

Transition management and related theories can be understood as new governance concepts, which aim to address the technical and societal complexity of the wicked problem of sustainability in ways that should be more effective than traditional governmental policy interventions. However, several authors have stressed that a shift to new modes of governing is not without problems (Diamond & Liddle, 2005; Edelenbos, 2005; Keast, Brown, & Mandell, 2007; Klijn & Teisman, 2003a; Klijn & Teisman, 2003b; Termeer, 2009). Explanations are found in the inevitable tensions or even contradictions or misfits between the new governance concepts and the existing governance systems.

When brought into practice, new governance concepts often create temporary institutional structures ('proto-institutions') parallel to existing institutions with which they may conflict (Edelenbos, 2005). In the field of public-private partnerships, when partners have difficulty with joint decision-making, they tend to revert to traditional forms by contracting out and separating responsibilities (Klijn & Teisman, 2003b). Termeer (2009: 314) identifies five groups of barriers public managers encounter when implementing new modes of horizontal governance (like partnerships or network governance): "(1) conflicting convictions concerning good policy making; (2) stereotyping potential partners (as ideological, incompetent or old-fashioned); (3) the framing of the situation (as a crisis, a race to reach a deadline or an experiment for a selective group); (4) fear (of undermining existing policy, relapsing into old politics or not reaching governmental targets); and (5) cover-up strategies (not showing doubts, hiding internal struggles or not being willing to face disappointments)" (p. 314). These authors raise questions regarding the institutional embeddedness required to prevent that new governance concepts become meaningless and useless in formal decision making.

Our review of multiple theories of steering transitions reveals a variety of leadership roles such as transition managers, visionary innovators, conveners, network managers, policy entrepreneurs, adaptive leaders or knowledge brokers. We assume that many governance systems cannot be considered perfect hosts for these new and varied forms of leadership. More in general we can say that many governance systems lack the capacity to enhance responsiveness, to cope with

uncertainties or to undertake long-term strategic decisions. These are the kinds of ambitions that underlie the above mentioned theories of societal change and intervention.

As a result, changing existing governance systems may be necessary to enable new ways of governing change. *Governing* refers to all those activities of political, administrative, social and economic actors that are aimed at steering or influencing transitions towards sustainability. From the assumption that these activities often involve attempts at changing people's behaviour, governing often means governing change. *Governance* refers to the system of actors, frames and rules that emerges as a pattern from governing activities and structures subsequent governing activities. In general, governance institutions tend to create continuity in outcomes rather than change. Nevertheless, as we have the ambition to say something about new modes of steering towards sustainability we cannot restrict ourselves to stressing the persistence of existing governance systems. In other words, dealing with change in a renewed way involves institutional change in the form of ongoing and sometimes fundamental reviewing of the governance system itself (Hendriks & Grin, 2007).

What kind of changes in governance systems would be required to enable the new ways of governing change we discussed in this paper? We can only begin to answer this question here. We will do so by trying to specify it in terms of governance capacities (Arts, Leroy, & van Tatenhove, 2006; Nelissen, Goverde, & Van Gestel, 2000). Because the different theories put forward different steering strategies and leadership roles, they will also ask for different changes in governance systems to enable them. Above we have argued that steering societal developments in areas as complex as sustainability is unlikely to be successful when only one theory is used. The same line of reasoning is relevant for rethinking the governance system. Theoretical multiplicity also implicates that changing the governance system to enable one new steering concept is unlikely to be sufficient. The tendency of each of the discussed theories is to suggest a new way of defining governance capacity, while disregarding other possibilities. In contrast, we propose to think of governance capacities in plural, involving multiple and potentially conflicting capabilities of a governance system. In spite of focusing on one change trajectory to enable one new steering concept, we recommend to enlarge the capacity of governance systems to deal with sustainability challenges in a renewed way. Based on the discussed theories we have identified five relevant governance capacities:

(1) Capacity for responsiveness: the capacity of a governance system to respond quickly to changing agenda's and societal expectations.
(2) Capacity for reflection: the capacity of a governance system to understand and deal with multiple frames of reference in society and policy
(3) Capacity for revitalization: the capacity of a governance system to unblock deadlocks or stagnations in policy processes
(4) Capacity for adaptation: the capacity of a governance system to flexibly change course in response to quick and uncertain changes
(5) Capacity for variety: the capacity of a governance system to embrace difference and variety

These capacities are not to be interpreted as individual skills but as systemic capabilities. Each of these capacities responds to specific challenges for governing change and to specific fields of theory and practice (see Table below). In line with our approach or theoretical multiplicity, we do not assume that these governance capacities are easy to reconcile. Rather, we assume they are potentially conflicting because of the distinct contribution they make to overall governance capacity. The focus on future uncertainties in the capacity for adaptation, for example, can be at

odds with the focus on quick responses to hot issues on the public agenda implied by the capacity for responsiveness. For a given policy problem, the capacity for reflection, for example, might entail a different set of strategies and interventions than the capacity for revitalization.

Governance Capacity	**Challenges**	**Main theories and concepts**
Capacity for responsiveness	Increasing changes in expectations of society	Policy agenda setting
Capacity for reflection	Increasing changes trigger increasing frame diversity	Multi actor collaboration Network governance Configuration management
Capacity for revitalization	Increasing chance on deadlocks and stagnations	Configuration management
Capacity for adaptation	Increasing complexity and unpredictability of changes	Adaptive management Transition management
Capacity for variety	Increasing inclusion of actors, ideas, interests, values, roles and steering arrangements in change processes	Transition management Multi actor collaboration Network governance Configuration management

In sum, our argument for theoretical multiplicity implicates an argument for multiple governance capacities. Hence, the term change refers here to both the challenges of societal change to which government needs to respond, as well as the changing of governance itself in order to deal with these processes of change. Public management in the broad sense of the term can steer change in different ways and could be better prepared for doing so by developing multiple capacities for responsiveness, reflection, revitalization, adaptation, and variety.

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