Systems Thinking, Organizational Change and Agency: A Practice Theory Critique of Senge's Learning Organization

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ABSTRACT   *From its earliest formulations, 'systems thinking' has been at the heart of the learning organization, and it provided the inspiration for Senge's widely influential and idealised image of a future characterised by new possibilities for organizational change and human agency. But Senge's vision of learning organizations was always characterized by a practice problematic: he did not define the social practices of learning that would realise the utopian ideals of the learning organization. Change as systems and change as practices, systems theory and practice remain profoundly incompatible. Growing awareness of this issue has led to increasing doubts about the future of the learning organization, and there are mounting calls for new starting points or the final abandonment of the whole concept. Yet despite this sense of disillusionment, there have been few critical appraisals of Senge's legacy from a practice theory perspective that seeks to unravel the links between practice and learning, agency and change. Here, it is argued that Senge's work can be re-conceptualised as a partial fusion of 'systems thinking' and learning theories that leads to a concept of organizational learning as a process of system-based organizational change. However, the concept is critically flawed in two major respects. First, as a systems or structural model, it is theoretically flawed, because it cannot theorise the organizing practices by which learning and change occurs in organizations. Second, it is substantively flawed as a practice for increasing the dispersal of human agency, power, knowledge and autonomy within the workplace. It is concluded that Senge's concept of the learning organization now faces its final abandonment as a theoretical and practical guide to organizational change.*

KEY WORDS: Practice theory, systems thinking, organizational change, human agency, learning organization

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Introduction

New possibilities for organizational change and human agency have been central to the 'learning organization' from its inception, and they provided the inspiration for Senge's enormously influential attempt to blend the 'hard' and 'soft' strands of 'systems thinking' into a practice-oriented manifesto of workplace empowerment. As the most important popularizer of 'system thinking', Senge sought to incorporate the hard, practical problem-solving models of 'system dynamics' into his work – a clear reflection of his legacy as a graduate in engineering (Stanford) with a Masters in social-system modelling and a doctorate in management from MIT (Moxnes, 2009). But Senge's work also borrowed selectively from the soft prescriptive-system learning theories of the organizational development (OD) tradition, stretching back to Lewin's (1999) classic work on 'action research', 'change agency' and group learning through reasoned dialogue. Lewin's work on group dynamics was informed by optimistic assumptions regarding systems behaviour and feedback structures that allowed the emergence of new 'quasi-stationary states of equilibrium' in a context of continuous change (Caldwell, 2006). Argyris and Schön (1978) were to further develop these ideas into the concept of organizations as 'learning systems' that encouraged 'double-loop' learning. It was, however, Senge who made 'system thinking' the cornerstone of the learning organization and, in doing so, brought the OD tradition back to its origins in general systems theory (Argyris and Schön, 1978; Mirvis, 1996; Argyris, 2003).

Despite the overarching importance of systems thinking to Senge's learning organization, its theoretical implications have not been seriously explored (Bui and Baruch, 2010). Senge (1990) examined five 'disciplines' in his original formulation of the learning organization: personal mastery, mental models, team learning, shared vision and systems thinking. Achieving 'personal mastery' required the self-discipline of 'meditative practice' and the ability to see the world holistically as an integrated 'mind-body system': as individuals, we participate in systems, and we must locate our everyday practices within a systemic awareness of the whole. Creating and 'managing mental models' also required new systemic insights into the ingrained management assumptions that block real system change and learning. Building a 'shared vision' goes further in supporting systems thinking by requiring organizations to collectively develop a common sense of purpose and direction. Similarly, encouraging 'team learning' through new forms of shared learning, dialogue and collective knowledge defined the systemic process for creating a shared vision. Finally, the fifth discipline of 'systems thinking' was concerned with disclosing the universal 'feedback structures' of system change and organizational learning: 'System thinking is a discipline for seeing wholes. It is a framework for seeing interrelationships rather than things, for seeing patterns of change rather than static "snapshots"' (Senge, 1990, p. 23). Crucially, it is the fifth discipline that forms the 'conceptual cornerstone' that 'integrates' the other four 'supporting' disciplines, by 'fusing them into a coherent body of theory and practice' (1990, p. 12).

While Senge's claims regarding the five disciplines have to be treated with considerable caution, and his work has 'many faces' (Ortenblad, 2007), it is clear that his undoubted innovation was to conjoin systems thinking with practice and

learning in his formulation of the learning organization. This possibility was emergent in the treatment of societies and organizations as 'learning systems', in which learning was, of necessity, 'a groping and inductive process for which there is no adequate theoretical basis' (Schön, 1973, p. 57). From this perspective, the learning organization was bound to be an underdeveloped theoretical construct, because it could not theorize the inductive process of practice. Getting from 'systems' to 'learning' also posed a theoretical dilemma in defining how individuals and organizations learn. Individual learning is, intrinsically, a highly problematic concept in sensory, cognitive and psychological terms, and this is compounded if 'agency', as an action-theoretic concept of intentionality or the ability to act, is identified primarily with the capacity to learn. Learning as action or 'practice' may seem a self-evident manifestation of our everyday conscious experience, but it raises enormous conceptual issues in specifying how individual learning can become 'rational' or 'effective' in the face of 'defensive reasoning' and 'self-deception' (Argyris, 2004, p. 7). Can we conceive learning free from unconscious desires and complex emotions? Can learning, as a form of theoretical knowledge, ever be detached from 'agency' or the motivations, self-interests and values of human actors?

Senge follows Argyris' classic lead in arguing that learning is guided by practices ('theories-in-use' or learning by doing), rather than theoretical knowledge ('espoused theories' or what we say we are doing). In this sense, theoretical knowledge is not learning, unless it is transformed into practice; we do not learn, unless we change our behaviour (Argyris, 2004). But Senge goes even further. Learning is not an individual behavioural attribute, but a 'double-loop' and shared, cognitive learning process that can change organizations by changing our mental models (Senge, 2006, p. 384). The problematic nature of learning as intentional action is apparently resolved by shifting it from the individual to the organization-level as a shared cognitive construct that identifies practice with learning (Weick, 1991; Ortenblad, 2002; Marshall, 2008).

Despite this new emphasis on practice as doing and learning, Senge treats 'practice' as a second order manifestation of knowledge and insight into how systems of social behaviour can be changed (2006, pp. 383–7). We learn because we understand how systems behave, and this understanding leads to better practices. The expert and objectivist bias towards theoretical knowledge of systems takes priority over the outsider viewpoint of participants engaged in everyday practices of learning. In other words, the 'agency' of practice-based learning is subsumed into a systems construct. This conflation may partly explain why the success of Senge's work was always plagued by a disjunction between the utopian rhetoric of learning and change and the absence of practical advice on how learning organizations could be created (Friedman *et al.*, 2005). At one level, this unresolved tension was expressed by an increasing differentiation between the heterogeneous notion of the 'learning organization' – a type of organization embraced by practitioners as a prescriptive systems ideal – and the idea of 'organizational learning' as a multiplicity of collective, situated or participative social practices of learning that were the objects of empirical investigation and analysis by academics (Ortenblad, 2002; Easterby-Smith and Lyles, 2003; Argote, 2011). Practitioners and consultants were willing to 'sell' the intangible end-state of the learning organization

as a plausible and practically relevant systems construct that required their expert interventions, while many academics wanted rigorous evidence that would bridge the perceived theory-practice divide (Grieves, 2008).

Growing awareness of this divide has led to an increasing sense of disillusionment with the learning organization as a vision of workplace transformation and an inspirational guide to practice. At first, Senge's search for the learning organization appeared to have been extraordinarily successful. *The Fifth Discipline* (1990) has sold over one million copies worldwide since its publication (with a revised edition in 2006) and the supporting *Fieldbook* (1994) has sold more than 400,000 copies. Part of the explanation for this success undoubtedly lies in Senge's moral mission to re-humanise the workplace by fusing an eclectic mix of ideas on 'learning' and 'systems thinking' to practical ideals of organizational development, leadership and self-mastery. With this fusion, Senge offered a positive and populist critique of bureaucratic corporations in which resistance to change and top-down leadership had eroded the broader systemic and ecological virtues of community, shared learning and personal development (Senge, 2009). But ultimately, Senge's attempt to reinvigorate the hallow shell of American corporate capitalism with the utopian dream of the learning organization failed to deliver on its practice promise. As a consequence, the learning organization appears to be in the terminal stages of its decline as a vision, management fad and practical guide to organizational change.

This article offers a critical re-examination of Senge's legacy, both as a systems-thinking practitioner and theorist of organizational learning and change. It focuses on the practice problematic at the centre of Senge's work, and it compares and contrasts his legacy to the broad, diverse and emerging fields of practice theory perspectives on *learning* and *knowing* (Reckwitz, 2002; Fox, 2006; Gherardi, 2009). These two traditions are profoundly incompatible, although they share similar questions and concerns: how to accommodate change with the continuity of practices and the stability of systems; how to cope with the limits of theoretical knowledge; how to theorise 'emergence' beyond the reproduction of systems and structures; how to define 'agency' as a category that includes individual properties of actors and the properties of systems/structures (Giddens, 1984; Bunge, 2003). In exploring these traditions, the idea of the learning organization will be examined as a theoretical construct of systems thinking and as a theorization of practice. Senge, of course, is not a 'theorist' in any strict sense, nonetheless, his systems-thinking perspective is imbued with a theoretical legacy that has inspired practitioners, precisely because it seeks to translate theoretical concepts and ideas into practice (Senge *et al.*, 1994; Senge, 1999). We must, therefore, treat Senge's practice ambition seriously if we are to understand the theoretical limitations of the learning organization and its failure to deliver realistic principles of practice.

The article is organized as follows: it begins with a brief overview of the main parameters of a practice theory perspective on learning. This provides an alternative theoretical perspective on learning, practice and agency against which Senge's ideas can be compared and contrasted. The focus then turns to an exploration of systems thinking and the limits of the learning organization as a system-dynamics construct based on ideas of 'feedback', 'archetypes' and a 'theory of

structure'. The limitations of system dynamics are also analytically explored in terms of Senge's more recent, if cursory, engagement with Giddens' (1984) agency-based concept of 'structuration' and Weick's (1991, 1995) concept of 'sensemaking' as enactment: both early precursors of practice theory perspectives. This is followed by a discussion of the limitations of Senge's attempt to translate the learning organization into a practical theory of organizational change and workplace empowerment. Finally, it is concluded that Senge's work has two major analytical flaws: first, systems-thinking concepts cannot explain the organizing practices and learning processes by which systems as 'feedback structures' and 'archetypes' come into being and change; second, the idea that 'structure produces behaviour' leads to an identification of learning with change, which narrows the understanding of human agency and the practical possibilities of organizational change. From this perspective, Senge's concept of the learning organization is critiqued as a guide to workplace empowerment, organizational change and human agency.

Practice Theories: a Brief Overview

Situating a critical re-examination of the learning-organization concept within the field of practice theories is a complex task. Practice theories and perspectives on *learning* and *knowing* are notoriously difficult to classify or characterize, partly because their methods of inquiry are so diverse (Turner, 1994; Fox, 2006; Gherardi, 2009; Geiger, 2009). They do, however, share some common assumptions, and these will inform the major parameters of this critical review of Senge's work. Most practice theories question foundational claims to knowledge based on 'representationalism' (Schatzki, 1997, p. 293). Rather than referring to 'truth' and 'objectivity' or fixed and cumulative ideals of empirical or propositional knowledge, the focus shifts to questions of 'knowing' and 'learning' in practice. Knowledge is not a cognitive 'possession' inside the head of actors, nor is learning purely an individual activity. Instead, they are 'processes' of participation or interaction within a 'community of practice', or a 'community of learning', that take place within shifting *practice spaces*. In this sense, learning does not simply involve the transfer or distribution of cognitive and codified knowledge; it includes the social practices within which 'shared learning' and tacit knowing are embedded (Bourdieu, 1977; Wenger, 2000). This perspective partly explains why there is a close affinity between practice theories and pragmatist philosophies: both avoid exploring arguments for knowledge or truth. Practical knowledge takes precedence over theoretical knowledge (Raelin, 2007).

Following on from this reversal of the theory-practice relationship, practice theories seek to break free of the traditional dichotomies of representational thought and epistemology. Subject and object, theory and practice, mind and body, rationality and emotion, individual and society, nature and culture, self and other, agency and artifacts are all mutually constituted within 'social practices' (Bourdieu, 1977). One implication of this shift is that *learning* and *knowing* are characteristics of individuals and groups, rather than cognitive attributes of 'mind' or things processed by organizations. This rejection of conventional dichotomies also partly explains why practice theorists are reluctant to derive a concept of the 'social', or 'social

practices', from emergent, or hypothetical, 'structural' categories, whether these are derived from holistic and universal concepts of culture and society or abstract, universal or functionally specified entities such as 'order' or 'system' (Parsons, 1951). For many practice theorists, concepts of system and order are reducible to forms of 'structuring' and 'organizing' that are produced and reproduced, modified and transformed by the everyday enactment of the social practices of human agents, as well as non-human artifacts, objects and things (Schatzki, 2002). As such, this mediation of 'organizing' by social practices means that agency and change are intrinsic to the very processes and practices of organizing.

Finally, most practice theories and perspectives also involve an implicit or explicit reconceptualisation of the polymorphous concept of 'human agency' (the capacity to act). By focusing on practices as the site or locus of the 'social', the emphasis shifts to how the ongoing enactment of everyday activities is guided not by rationality, intentional action, explicit knowledge or cognitive states, but by past practices, taken-for-granted understanding, know-how, tacit knowledge or informal rules – all of which may be diffuse, indeterminate or unreflective (Bourdieu, 1977). An epistemology of practice therefore assumes that agents share tacit knowledge or some form of collective understanding in their accomplishment of practices; they have the know-how to carry on within a practice without being able to explicitly state what this is or how it is learned. This 'prioritisation' of practices over actors and individuals has some disconcerting implications if taken to its logical conclusion (Schatzki, 1997, p. 285). In principle, it is possible to have 'practical intelligibility' without representation, intention without reason, knowing without formal knowledge and, most paradoxically, *agency without actors*. However, many practice-based theories of learning are very reluctant to completely de-centre or disassemble the relations between actors, individuals and agency, because they wish to retain some link between learning and practice, agency and change (Schatzki, 1997; Blacker and Regan, 2009). Instead, the goal is to establish a distance from *agency as action* or purely actor-centred, cognitive and individual explanations of human practices. From a practice theory perspective, *agency as practice* is a form of 'doing and saying', of learning and knowing in practice, rather than the purely reflexive activity of a contemplative actor who thinks, then acts (Schatzki, 1997; Reckwitz, 2002; Caldwell, 2012).

These assumptions, regarding practice and learning, agency and change, will guide the critical re-examination of Senge's work.

Systems Thinking and the Learning Organization

Systems thinking has a long and complex intellectual genealogy, and it has assumed an enormous and disparate variety of disciplinary and trans-disciplinary forms (Mingers, 2006). Various attempts have been made to synthesise systems thinking within an overarching theoretical paradigm, or a 'general systems theory', that encompasses both the natural and human sciences (Midgley, 2003). Invariably, this requires a universal theory of systems, not simply as static entities or closed structures defined by the relation between component parts, but also the concept of systems as *processes* that are open to change

through internal dynamics of self-regulation or interactive 'feedback' with the environment. This synthetic focus on *systems as structures and systems as processes* has never been theoretically resolved (Luhmann, 1995). Compounding this issue, systems thinking, from the 1970s onwards, has become divided into traditional streams of applied or 'hard' systems thinking, which tends to be objectivist and expert driven; and softer, more interpretative, versions that include observers in the definition of systems (Checkland, 1981; 1983). Sometimes the origin of this divide is located in an 'epistemological break' between *first order cybernetics* (hard) and *second order cybernetics* (soft), although the distinction is often overstated (Matthews, 2006; Mingers, 2006). Cybernetics was originally conceived as an anti-reductionist 'science' of communication and control that focused on information and feedback. Instead of conceiving 'control' in positivistic terms as a series of linear chains of causes and effects, the crucial cybernetic idea is that 'feedback' allows systems to adapt, while retaining their intrinsic properties as systems (Warren, 2004). Ashby's (1956) famous 'law of requisite variety' partly carried this insight from feedback to learning when he argued that systems adapt and survive if their rate of learning matches the rate of change in the environment. The idea of feedback also marks the divide between first order and second order cybernetics: the former focuses on the 'laws' of negative feedback and control (stability), while the latter focuses on the 'generative' possibilities of positive feedback and change. Crucially, cybernetic theorists also tend to diverge in their approach to 'agency': the exploration of negative feedback and control assumes that systems 'exist' and have purpose built into them so there is no need for human intervention, while those who focus on positive feedback and learning assume that agency is necessary in the constitution and change of systems over time (Checkland, 1985). In other words, hard systems theory assumes that 'systems' form an ontological reality that can be observed, while soft systems 'transfers systemicity from the world to the process of inquiry into the world' (Checkland, 1983, p. 671).

Senge's embrace of systems theory comes out of these diffuse theoretical origins, but his particular variety of 'systems thinking' is essentially a soft reworking of the hard presuppositions of the 'system dynamics' theories of Jay Forrester (1968), of whom Senge was a mentee, collaborator and colleague at MIT (Forrester and Senge, 1980). Mainstream system dynamics tends to share many of the overarching assumptions of 'general systems theory' and first order cybernetics, including the following: a belief in the underlying unity of the natural and social sciences; the idea that the properties-of-the-whole have more explanatory power than the properties-of-the-parts; the assumption that overall systems causality, or the interactions between components and subsystems, should replace positivistic notions of linear casualty; and, crucially, the idea that systems as a whole can change and evolve because they are 'open' and 'dynamic', rather than closed and entropic. Forrester's and Senge's work shared these assumptions, and, in many respects, Senge's work as protégée is a popularising homage to Forrester's vision, by extending his ideas into learning theory, management science and organizational change (Grieves, 2008; Moxnes, 2009).

While system dynamics shares many of the grand ambitions of systems theory for exploring large, complex and non-linear interactions, it broadly represents a

much narrower strand of systems thinking, and it has 'hard' and strongly deterministic overtones (Lane, 2000). System dynamics may be conceived as 'a theory of structure', but it is essentially a method and a set of computer simulation modelling techniques that tends to be applied to a narrow range of practical control problems in non-linear and complex dynamic systems. Modelling 'practical problems' and gaining 'useful' results are, ultimately, more important than a theoretical understanding of general systems (Wolstenholme, 2003).

Feedback and Archetypes

The central idea of mainstream system dynamics is that variables within complex systems are locked in a series of reinforcing feedback loops – both positive and negative – and they can be mapped through information flows and delays in reaction times (Warren, 2004). Positive feedback loops (self-reinforcing) tend to reinforce change, while negative feedback loops (self-correcting, limiting or balancing) tend to oppose change, thus ensuring a variable within a system remains constant (Senge, 1990, p. 101). It is these interacting loops that constitute the functional 'structure' of the system, as well as the main 'causal' determinants of system behaviour. For Senge, almost all the leverage points of 'deep change' in organizations lie 'in the balancing loop – not the reinforcing loop' (1990, p. 101).

By studying feedback processes that control, regulate or determine complex systems behavior, Senge (2006) claims that one can identify a limited range of 'system archetypes' – 10 are identified. System archetypes map the unintended consequences, side-effects or delayed reactions of feedback loops inside organizations, and they reveal the organizational boundaries that hide the dysfunctional failures of managerial action and practice. For example, in the 'limits to growth' archetype, an organization or business may grow beyond its capacity to manage growth effectively, slowly engendering more and more negative feedback loops that eventually slow down, or even reverse, its growth pattern. Managers are usually unaware of these systemic relationships between feedback loops, because they are often counter-intuitive – the result of long-term unintended consequences – and they therefore treat symptoms (counterproductive work routines) rather than causes, creating resistance rather than change (Senge, 1990, pp. 90–2). Once system archetypes are mastered, however, leaders, managers and teams can break out of their existing 'mental models', or cognitive representations, to understand longer-term system complexity and exercise control over the real levers of strategic change in organizations (Senge, 2006, 389–400). It is this isomorphic relationship between knowledge and action, learning and practice that appears to make archetypes powerful mechanisms for accelerating learning and change in organizations (Wolstenholme, 2003).

These reciprocal claims, regarding feedback structures, complex systems behaviour, control dynamics and leverage points of change, are not grounded in hard empirical evidence, rigorous causal propositions or prediction (Senge, 1990, p. 73). Causal validation and verification are not possible through hypothesis testing, because linear causes and effects are not measurable or observable. Directly paraphrasing Forrester, Senge claims we must abandon the positivist notion that 'cause and effect are close in time and space' (2006, p. 63). The

goal of system dynamics is not to prove that *one* model is correct, but that 'all models are wrong' (Sterman, 2002). In translating this viewpoint from modelling to learning, Senge conceives the exploration of system archetypes as an exercise in management learning and re-education.

Despite this apparent emphasis on post-positivism and plurality, system dynamics offers its own alternatives to verification procedures and linear models of causal predictability. The idea of feedback loops and structures appears to operate as a 'black box', but with functionalist presuppositions (Jackson, 2003). Traditionally, the black box concept in systems theory assumes that you do not have to understand how internal processes operate; 'laws' can be derived from systems feedback, and this allows the possibility of manipulating inputs to achieve desired outputs. In system dynamics, however, the measured data inside the black box does not deliver short-term outputs; rather, it models the *latent* changes of the system over the long-term. This viewpoint appears to allow system dynamics to avoid an event-oriented, data-driven or causally reductionist world view of systems.

Yet Senge, like Forrester (1968) before him, also wants his system models to disclose, or 'forecast', the underlying systemic 'causes', or outcomes, of human behaviour. The internal structures of feedback replace linear causality by a 'circular causality' that patterns behaviour over time (Mingers, 2006). System archetypes are, therefore, not just counter-images of prevailing mental models – another way of seeing the world and understanding it – they are designed to disclose the 'real' foundations or causal mechanisms of 'previously unseen forces' that can be changed by the direct interventions of the systems modeller (Senge, 2006). A black box is transformed into a transparent 'white box' (Cavaleri, 2005). In this respect, system archetypes and feedback loops are treated as value-neutral explanatory constructs that allow technical and managerial solutions to systems failures.

Central to this paradoxical blend of scientific humility and technocratic hubris is the assumption that feedback within systems is reducible to two causal loops: positive-reinforcing and negative-balancing. But this characterization of system feedback structures can also be conceived as a manifestation of broader 'autopoietic' or self-producing processes of 'morphogenesis', which involve a multiplicity of 'deviating–counteracting' and 'deviation–amplifying loops' that interact in a highly complex and heterogeneous manner (Maruyama, 2003). Unlike open and dynamic systems that interactively transform inputs into outputs through the control mechanism of feedback, autopoietic systems are self-organising and self-constituting. From this perspective, Senges's system dynamic diagramming of reinforcing and balancing loops is simplistic and ultimately misleading, because it suggests that change can be managed through disclosing a series of feedback control loops and interacting cause-effects relations that define a set of generic archetypes. Moreover, Senge's identification of change with deviation-countering processes (or negative balancing loops), rather than deviation-amplifying (or positive loops), means the cybernetic focus of his work is on *control and equilibrium* within systems. In contrast, 'second order cybernetics' shifts the focus to deviation amplifying change (or positive feedback loops), as well as the possibility of change as the ongoing self-organizing principle of

'complex adaptive systems' (Maruyama, 2003; Antonacopoulou and Chiva, 2007). With this redefinition, the explanation of systems in terms of 'functions' or 'purposes' appears epistemologically unnecessary, although the idea of 'self-organisation' still remains ontologically problematic in any discussion of human social behaviour.

Systems and Practices

The intrinsic limitations of Senge's reading of systems and feedback processes also reveals the managerial and instrumental world view that implicitly informs both the theoretical assumptions of system dynamics and the learning organization concept (Grieves, 2008). System dynamics may be a methodology of practice, but it presumes an ontology: systems exist 'out there' as real entities, because the world is a system of systems. This meta-construct also informs a set of reinforcing assumptions; systems as social entities have purposes and their parts have functional properties; systems have feedback mechanisms that can be subject to causal analysis; and the causality of systems can be subject to control or transformation by the intervention of the observer, expert or manager. By accepting these assumptions, Senge appears to make the classical error of many forms of systems thinking – he conflates 'causes' with 'functions': system dynamic explanations constantly revert to functionalist explanations. It is this conflation that allows him to assume that feedback structures can be reduced to a limited range of system archetypes with clearly defined boundaries and leverage points of change (Senge, 2006).

Unfortunately, few real world organizational problems are reducible to the functionalist-prescriptive properties of systems. Even if we assume that cause and effect is a long-term manifestation of system behaviour, and change can be leveraged through negative feedback, this is still not adequate as a model of action or practice or its unintended consequences (Warren, 2004). Invariably, we do not know what 'action' or 'practice' means until we enact it. In this sense, the *a priori* causality of systems or their long-term causal effects cannot explain the spatial-temporal processes of practice. Like Forrester, Senge sidesteps the issue of practice; the negative causality of feedback operates behind the backs of actors: 'They only come back to haunt you in the long term' (2006, p. 91). In effect, the efficacy of practice as an issue is simply assumed as a virtuous black box of feedback processes that will emerge in the future to disclose the real or true causality of our actions. While this allows Senge to affirm the importance of practice as a learning intervention, the influence of human action on systems remains elusive and mystifying.

Senge appears undaunted by these epistemological and practical concerns. Instead, the system-thinking assumptions that link feedback, archetypes and organizational change to processes of learning become the programmatic intent of his work: 'the reasons that structural explanations are so important is that only they address the underlying causes of behaviour at a level that patterns of behaviour *can be changed*. Structure produces behaviour, and the underlying structures can produce different patterns of behaviour' (Senge, 1990, p. 53 [*emphasis in original*]). By modelling feedback structures, especially negative feedback loops,

we can change behaviour at an organizational level. This idea is central to Senge's rejection of behaviourist ideas that you can change behaviour with behaviour, and his parallel objection, in principle, to positivistic notions of organizations as mechanistic entities. For Senge, 'behaviour follows structure', because different people placed within the same structure will behave/learn in the same way (Mingers, 2006). The learning organization reproduces this structural logic – system learning or organizational learning takes priority over individual learning.

For Senge, changes in behaviour occur through systemic change, and organizations are 'living systems' with organic and ecological qualities and so they can only be understood as dynamic wholes that can learn (2006, p. 77). Holistic 'systems thinking', ecological thinking and the learning organization are synonymous: 'Companies are actually living organisms, not machines... We keep trying to drive change – when what we need to do is cultivate change' (Senge 1999, p. 180). However, Senge does not clarify his concept of organizations as living systems or his notion of organic change as 'growth' that can be 'cultivated'. Nevertheless, this focus clearly reveals his tendency to overlay the functionalist assumptions of system dynamics with evolutionary ideas. Systems are not merely causal mechanisms, they have functional properties, and they appear to 'evolve' because they have higher order purposes. Function and 'purpose' is therefore identified with feedback mechanisms that sheer, control, or modify the adaptability of systems, and without feedback mechanisms, system archetypes appear to have no causal possibilities for adaptability. This conflation of 'function' and 'purpose', therefore, parallels the conflation of function and causes, and it leads, almost inevitably, to teleological modes of explanation in which the increasing 'growth', 'development' or 'adaptability' of a system serves the needs of the system as a whole (Van de Ven and Poole, 1995). In this way, the functional emphasis on purpose, self-regulation, feedback and adaptability as learning replaces any explanation of how or why change occurs: the detailed contextual and empirical exploration of the origins, causes or practices of organizational change is lost in the abstract functionality of hypothetical system needs or imperatives (Parsons, 1951). Again, this is a classic dilemma of social systems theories of organizational change, even when they attempt to dispense with the idea of systems as entities with functions (Luhmann, 1995).

Beyond System Dynamics: Structuration and Sensemaking

The difficulty of linking systems thinking, learning and organizational change partly explains why Senge's later work is notably more cautious in its appropriation of system dynamics: '*The Fifth Discipline* proposed a definition borrowed from system dynamics – which looks at structure in terms of feedback interactions within a system. Our new definition of that term is "a pattern of interdependency that we enact."' (Senge, 1999, p. 181). Senge also notes 'system dynamics has had little to say about where particular feedback structures come from, or why some structures dominate and not others. Without an account of the coming into being of the feedback structures that give rise to persistent patterns of behaviour, *system dynamics lacks a compelling theory of practice* that can inform leaders interested in creating new structures, behaviours and outcomes' (2001, p. 2

[*emphasis added*]). In other words, a systems theory that cannot explain how systems change cannot define the possibilities of practice and human agency.

With this implicit criticism of his own work, Senge appears to move away from the expert-centred concept of system dynamics and towards a more learning-centreed theory of organizing processes and practices that can incorporate organizational change and learning. But the fundamental difficulty with system dynamics as a methodological tool and modelling technique is that its theoretical analysis of general systems and structure is intrinsically weak, as is its theorization of practice: 'The implicit theory of practice in classical system dynamics is technocratic: expert system dynamics analysts gather data through interviews and observation and develop system dynamics models, and then recommend solutions to "policy makers" based on the analysis of models' (Senge, 1998, p. 9-10). To construct a broader theoretical overview of system dynamics that includes practice would require a reworking of 'structure' to accommodate both the influence of systems and organizing processes, structure and human agency (Bunge, 2003; Caldwell, 2006). Giddens' (1984) influential agency-based 'structuration theory' and Weick's (1995) 'sensemaking' concept of 'enactment' are two attempts to address these issues, and it is no surprise that Senge's later work begins a partial dialogue with both Giddens and Weick (Reichel, 2004).

Giddens' structuration theory is primarily concerned with establishing a relationship between agency and structure as one of *identity* or synthetic 'duality'. Structuration refers to both the temporal processes of *producing-reproducing* structures through social practices and the epistemological identification of agency and structure. This involves a rejection of the holistic idea of 'structure' as systems of integrated normative regulation that exist over time as a collective external reality 'out there' (Parsons, 1951). It also involves an ontological rejection of micro-macro distinctions, dichotomies of subjectivism and objectivism, theory-practice divides and the individual-versus-society dualism that have plagued classical sociological theories of social order and action. Instead, Giddens proposed that the relationship between agency and structure is mediated through social practices or what he terms, the '*duality of structure*'. Structures are dualities because 'the structural properties of social systems are both medium and outcome of the practices they recursively organize' (1984, p. 25). Moreover, because 'structure' is a process-based and practice construct sustained by agency, it is open to change, and this involves a rejection of the determinism implied by evolutionary and old-style systems concepts of social order: '*All reproduction is necessarily production*. . .and the seed of change is there in every act which contributes towards the reproduction of any ordered form of social life' (Giddens, 1976, p. 102 [*emphasis in original*]).

Weick's (2001) 'sensemaking' concept reinforces Giddens' structuration theory, although its epistemological origins are in pragmatism, symbolic interactionism and cognitive psychology, rather than sociological explorations of social structure and social change. Sensemaking refers to ongoing processes of meaning 'enactment', through which individuals and groups create intersubjective interpretations of the world: 'sensemaking is an attempt to produce micro stability amidst continuing change' (Weick, 2001, p. 22). This involves a number of related assumptions: the replacement of organizations as pre-given structures or functional entities with goals by 'organizing' as 'a stream of problems, solutions,

and people tied together by choices' (Weick 2001, p. 28); the idea that enactment occurs through narratives, symbols, talk and labels that create 'plausible stories' of events and causes; the assumption that managerial action is informed by self-ful-filling prophesies in which decisions become realized when they are treated as if they were true or, alternatively, they are treated as rational when they are realized – strategy and planned change are self-confirming or post-rationalizing actions (Weick, 2001, p. 170). And finally, it is assumed that human agency and self-iden-tity are not prescribed by authority, rules or formal roles, but are enacted through the pragmatic self-efficacy of practice. Combining these views, Weick argues that 'organizations are not built to learn' (1991, p. 119). Instead, he conceives organ-izational learning and knowledge creation not as possessions or cumulative acqui-sitions, but as 'puzzling' processes of doing and acting that are characterised by compromise, ambivalence and incompleteness.

Senge's later work draws explicitly on Giddens' theory of structuration and Weick's concept of enactment, especially when he ponders the nature of organiz-ational learning, but his references tend to be characteristically inclusive, rather than analytical:

> Giddens's structuration theory or Weick's theory of enactment say that social structures are continually being created through people's daily actions. From this vantage point humans are continually creating structures – patterns of interdependency – whether they are aware of it or not…According to this view, structures, rather than being fixed, are relatively 'frozen' for the moment. But they are also in continual flux, conti-nually being re-established or changed by actors in a system (Senge, 2001, p. 3).

Senge also claims that Giddens' theory of 'structuration' and Weick's theory of enactment are complementary to his own project:

> System dynamics and enactment or structuration naturally complement one another. Just as enactment addresses the blind spot in system dynamics around how structures come into being, so does system dynamics address the blind spot in the enactment view about how different structures have different dynamic consequences, that is give rise to different patterns of behaviour over time (2001, p. 8).

This statement carries considerable logical force: 'System dynamics does model emergent phenomenon, but it does not model the emergent process' (Flood, 1999, p. 73). Senge fails, however, to acknowledge that his structural reading of system change appears to be fundamentally at odds with both 'structuration' and 'enactment' as broader theories of the processual and emergent nature of change intimately connected with counter-posing concepts of 'knowledgeable human actors' and 'sensemaking' action.

Giddens offers the most forceful statement of this difference:

> I insist that structure exists only as the knowledgeabilty of human agents and its instantiation in social practices…Social systems only have structural properties – institutional fixity across time and space – insofar as agents knowledgeably repro-duce (but not intentionally reproduce) pre-existing modes of behaviour. Structure in

my sense is the medium and outcome of that reproduction, which always has to be explicated; to say that forms of activity are reproduced is not to show how and why they occur (Giddens, 1985, pp. 170–1).

Senge's work sidesteps the epistemological implications of this social practice viewpoint. For Senge, the major strength of system dynamics is its claim that structure *produces* human behaviour and action (Lane, 2000). In this sense, systems concepts *integrate* agency and structure, because they elevate systemic wholes above the temporal processes of human interaction and practice. Models of individual-level learning are therefore subsumed into models of organization-level or 'triple-loop' learning, a focus that often runs counter to Senge's overall tendency to valorise human agency (Senge, 2006). For Giddens and Weick, however, the main strength of *structuration as practice* and *sensemaking as enactment* is that the focus shifts to the exploration of the indeterminate production-reproduction processes through which structures and 'loosely coupled systems' come into being through human agency. From this perspective, the central question is generative: how do social practices of learning by groups or individuals sustain organizing processes?

Senge's later work begins to ponder this problem, but his invocation of 'enacted systems' as a theoretical 'integration' of 'system dynamics and enactment/structuration views of *causality in social systems'* is a rhetorical synthesis, rather than a measured act of theoretical or empirical clarification (2001, p. 7 [*emphasis added*]). The classic dilemma of organization theory and analysis is that it is enormously difficult to reconcile a static systems concept of 'structure' with an organizing or 'process' overview of organizational change as social practice (Archer, 1983). The ontological starting point of systems thinking is the reality of 'systems': that parts form wholes; that they exist as entities 'out there'; and that they have structural properties, behaviours or casual powers that are irreducible to their parts (Mingers, 2006). In contrast, practice theory assumes that structures and systems have no ontological status, because it is practice that defines what are parts and what are wholes. From a systems perspective, organizations as organisms also appear to have functional properties and boundaries; while for practice and processual forms of analysis, system boundaries are temporal constructions that could be otherwise (Giddens, 1984; Mingers, 2006). Certainly, if we take away the systems thinking assumptions of Senge's optimistic reading of organizational learning and change and replace them with a 'process' ontology of change as practice, we can radically subvert realistic notions of causality, as well as the remit of normative intervention (Tsoukas and Chia, 2002). Senge, like many organizational learning theorists, seriously underestimates the enormous difficulties of theorizing systems and organizing processes, structure and agency together, while somehow preserving the epistemological reality of an entity called the 'learning organization' (Archer, 1983; Reed, 2003; Mingers, 2006).

Discussion

From its earliest formulations, the learning organization has been beset by the difficulties of linking individual-level and organizational-level learning (Argyris and

Schön, 1978, pp. 14–15). If individuals are the primary agents of learning, and learning is an individual cognitive process, then how do organizations learn? Alternatively, if organizational learning is primarily systemic or collective, then what roles or functions do individuals play in sustaining supra-individual modes of learning? Answers to these questions can lead to 'anthropomorphism' (i.e. attributing learning to organizations) or, perhaps, worse still, 'reification' – treating an organizational entity as having functions and purposes of its own. Senge's work, and a good deal of the early literature on the learning organization, is often guilty of these failings (Friedman *et al.*, 2005, p. 22).

These problems are not new, of course. While the issue of individual versus organizational learning may appear unique to learning organization debates, it is, in many respects, a reinstatement of classic issues of 'agency versus structure' in organizational theory (Giddens, 1984; Reed, 2003). Senge's belated engagement with Giddens' structuration theory is an attempt to find a way of incorporating organizing processes and practice within a systems-based construct. Part of the reason this fails is that Senge's learning organization tends to give primacy to structure over agency, system over action, consensus over conflict, norms over practices. The great virtue of Giddens' work is that it is a sustained attempt at escaping these dualisms, even if it is not fully successful at incorporating 'structure' and 'system' into a process construct of agency that includes practice (Archer, 1983).

Any attempt to assimilate the learning organization into Giddens' structuration theory would require a focus on organizational learning as necessarily an agential process of practice-based learning and so change would be intrinsic to learning as organizing forms of human practices. In this sense, organizational learning and organizational change are synonymous because they are emergent manifestations of *agency as practice* (Caldwell, 2006). This reciprocal linkage between agency and change and organizing practices is crucial. If the learning organization is by definition *a theory of organizational change*, then it should be capable of exploring agency and change as practice-based processes of learning. Paradoxically, this focus is clearly missing from Senge's work, and it has serious consequences for his vision of organizational learning and his implicit understanding of agency, as well as his ideas on leadership (Caldwell, 2012). Senge's learning organization appears to be horizontal and process-based, because learning is widely dispersed, but it is, in fact, vertical, hierarchal and systemic, because it allows learning and knowledge creation to be defined and controlled by leaders, managers and experts. By thus limiting the scope of organizational learning, Senge limits the scope of organizational change and human agency.

The sources of this theoretical inversion are not hard to find. Without a practice-based concept of organizing processes and an accompanying exploration of the emergent nature of learning and change as structuration, sensemaking/enactment or, more broadly, *agency as practice*, Senge inevitably encounters enormous difficulties in theorising agency and change. Agency is simply the distributed embodiment of systemic goals and group learning processes, and this allows 'leaders' – as the carriers and creators of these goals and processes – to exercise leadership in 'enacting new structures' (Caldwell, 2012). For Senge, learning and change appear to be enacted upon people, rather than organizing practices that empower people.

While Senge's learning organization appears to mark a partial break with rational and individualist notions of agency identified with intentionality, self-interest or instrumental goals, he is unable to theorize 'process' and 'practice' and the multiplicity of dispersed and decentred modes of agency and learning in organizations. Senge assumes that learning neutrally distributes knowledge as a system-wide product that is codified and transferable. But simply distributing existing formal and explicit knowledge in and around organizations is not sufficient to explain 'knowledge creation' or knowing in practice. In particular, if organizational learning is processual, then it has to be conceived in terms of spatial-temporal flows of learning and 'complex knowledge' creation, rather than just within the fixed boundaries of system archetypes, which appear to create artificial learning boundaries to this process (Tsoukas, 2005). This requires an engagement with practice-based perspectives which conceive of *learning* and *knowing* as processes of doing and saying that are enacted in practice, rather than cognitive attributes of 'mind' or things processed solely by individuals or organizations (Schatzki, 2002). Senge's commitment to 'pragmatism' appears to point in this direction, but he does not explore this pathway (Cavaleri, 2008). Instead, by identifying system thinking with learning, Senge's learning organization becomes a one-dimensional theory of organizational learning and change, rather than a critical exploration of practice and learning (Senge, 2001, p. 3).

At the root of the limitations of Senge's system thinking concept of organizational learning is a broader failure of system theories to explore agency and change in relation to 'practice'. Systems theories invariably treat 'agency' as a subordinate category; actors or actions are 'carriers' or transmission mechanisms of system properties (Bunge, 2003). Alternatively, 'agency' is excluded altogether in the search for more rigorous definitions of system properties that are free from individual motives, intentions or models of rational behaviour (Luhmann, 1995). Systems theories also have problems in theorising agency and change, because they invariably use the same categories to explain the 'structural' stability or self-regulation and reproduction of systems as they use to explain processes of system change, otherwise 'change' becomes an extraneous process or 'agency' is treated as a completely peripheral category (Luhmann, 1995, p. 347).

In Senge's uncritical version of systems thinking, 'agency' is invariably subordinated to structure; it is structure that 'produces behaviour' (1990, p. 53). These structures exist as system entities beyond the practices that produce or reproduce them. Agency is surreptitiously transformed into a category of learning devoid of individual motivations or self-interest. Learning is not really produced by actors; they are simply the carriers of organizational learning or the transmission mechanisms of cognitive information flows within systems. Feedback from practice or trail-and-error learning is, therefore, intrinsically a second-order cognitive manifestation of an already predefined framework of system-based learning. The main focus of systems thinking is not on micro-practices or what people actually do, but on identifying what they do wrong so that 'learning disabilities' can be overcome. The instrumental goal is to identify 'barriers to learning' with resistance to change, rather than explore how learning and change emerge within continually changing social practices of human agents.

Conclusions

The search for the learning organization began with great moral promise over two decades ago, but it has now become increasingly enveloped by a sense of disillusionment as the prospects for transformation and change have failed to materialise (Caldwell 2005; Grieves, 2008; Smith, 2008). The sources of this predicament are complex, but they partly have their intellectual origins in the two major analytical flaws of Senge's work. First, the learning organization rests on a flawed concept of 'structure' that cannot explain the organizing practices and learning processes by which systems as feedback structures come into being and change. Without a practice-based exploration of how learning organizations emerge and change through social practices, systems thinking lacks a credible theory of organizational change and organizational learning. Second, 'agency' as a form of practice, combining intentional action and iterative behaviour with unintended consequences, is subsumed within the behavioural regulation of system thinking structures, archetypes and cognitive models, thereby undermining an analysis of how human action and learning is produced and reproduced through social practices (Bourdieu, 1977; Giddens, 1984; Weick, 2001). Senge (1990) may have wished to affirm a learning-centred vision of the workplace with people as 'active participants shaping their reality' (p. 69), but his narrow understanding of human agency limits its scope.

Senge's (1999, 2001, 2006) later work may partly recognize these problems when he claims that he wishes to move away from an expert-centred concept of systems dynamics and towards a learning-centred and more processual theory of practice that treats 'agency' as an emergent category of action. This requires, however, a theoretical re-engagement between system thinking concepts of organizational learning and a processual understanding of organizing as a manifestation of 'agency' enacted in practice (Bourdieu, 1977; Giddens, 1984). From this perspective, it may be possible to identify practice spaces and new organizing forms that will allow us to reconnect practice and learning, agency and change. Unfortunately, Senge's learning organization never really matched up to these theoretical and practical challenges, and we must now countenance its final abandonment as a vision of organizational change and human agency.

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