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ORIGINAL PAPER

The Relationship of 'Systems Thinking' to Action Research

Robert Louis Flood

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Abstract This article investigates the relationship of systems thinking to action research by reviewing the main developments in systems thinking and relating these to action research. There are two main lines of thought in systems thinking that lead to wholly different conceptions about action research. The first (systems thinking) advocates thinking about real social systems that it assumes exist in the world. The second (systemic thinking) supposes only that the social construction of the world is systemic. Greater emphasis is placed on systemic thinking consistent with its greater importance to contemporary action research. The article concludes that systemic thinking when taken to its practical conclusion from a critical perspective offers to action research a somewhat unique liberating praxis. Concern that any liberating praxis could remain hollow is addressed through a certain kind of 'spiritual' awareness that is suggested by wholeness.

Keywords Action research · Systemic practice · Holistic practice · History of systems thinking · Complexity theory · Systemic spiritualism

Introduction

Systems thinking emerged in the twentieth century through a critique of reductionism. Reductionism generates knowledge and understanding of phenomena by breaking them down into constituent parts and then studying these simple elements in terms of cause and effect. With systems thinking the belief is that the world is systemic, which means that phenomena are understood to be an emergent property of an interrelated whole. *Emergence* and *interrelatedness* are the fundamental ideas of systems thinking. An emergent property of a whole is said to arise where a phenomenon cannot be fully comprehended in terms only of properties of constituent parts. 'The whole is greater than the sum of its parts', is the popularised phrase that explains emergence. 'Synergy' is the sexy label for it. With

R. L. Flood (✉)
Maastricht School of Management, Endepolsdomein 150, 6229 EP Maastricht, The Netherlands
e-mail: flood@msm.nl

systems thinking, then, it is argued that valid knowledge and meaningful understanding comes from building up whole pictures of phenomena, not by breaking them into parts.

How to go about building up whole pictures of social phenomena is a big question that has led to much controversy in social systems thinking. One idea borrowed from the natural sciences assumes that all phenomena are real systems. The social world therefore comprises many interrelated social systems. A systems approach, it follows, entails qualitative and/or quantitative modelling of these social systems. Models are then employed as research tools to describe or explain a social phenomenon, or as decision-making tools that predict events and suggest actions to take today to achieve improvement some time later.

Another idea states that whilst the social world is intuitively assumed to be systemic, i.e., characterised by emergence and interrelatedness, we cannot go on and boldly assume that it comprises real social systems. After all, any understanding we have of social phenomena is by way of interpretation made through cognitive processes of the human brain. A systems approach therefore will employ concepts like emergence and interrelatedness to interpret social phenomena, rather than attempt to represent systems as if they exist in the world (Checkland 1981). Such a systems approach might be particularly empowering in this endeavour of meaning construction if the world is indeed systemic. That is, such a systems approach promises to construct meaning that will resonate strongly with people's experiences within a systemic world.

Systems thinking in the social sciences can be categorised, albeit rather crudely, into the two schools of thought sketched out above (see Jackson 2009 for systems applications across these eras). The first school I will refer to as *systems thinking*, since it advocates thinking about real social systems that it assumes exist in the world. The second school I will refer to as *systemic thinking*, which supposes only that the social construction of the world is systemic. Each view offers its own fundamental foundations for practice. This article explores some of the intricacies of each view, with each one offering its grounding for the form of practice that we know as action research. The article places greater emphasis on systemic thinking consistent with its greater importance to contemporary action research (e.g., Bell 2008; Burns 2007; Coghlan and Brannick 2010; Jackson 2003; McIntyre 2008; Reason and Bradbury 2006).

From Reductionism to Systems Thinking

System thinking came to the fore when research into living things encountered limitations to the concepts and principles of reductionism (see the collection of papers in Emery 1981). A counter-position in biology took on a coherent form by the mid-1920s. Several scientists began to think in a new way. Paul Weiss, Walter B. Cannon (credited with homeostasis) and, in particular, Ludwig von Bertalanffy, came to the fore. Von Bertalanffy demonstrated that concepts of reductionism were helpless in appreciating dynamics of organisms. Existence of an organism cannot be understood solely in terms of behaviour of some fundamental parts. Parts are interrelated and influence each other. The end result is a whole organism that exhibits emergence. In other words, an organism demonstrably behaves in a way that is 'more than the sum of its parts'. Biology therefore required new ideas to explain happenings like interrelatedness and emergence.

In this regard, von Bertalanffy (1950) developed a theory of open systems. *Open systems theory* employs functional and relational criteria to study the whole, rather than principles of reductionism to study simple elements. An organism as a whole is said to co-

exist in relation to an environment. Its functions and structure diversify or are maintained by management of a continuous flow of energy and information between organism and environment. Flows occur in an organism through its many interrelated parts. Parts are interrelated through feedback loops. *Feedback* is another key idea of systems thinking.

There are two types of feedback; one is known as negative feedback with balancing loops and the other as positive feedback with amplifying loops (see for example Forrester 1968; Wolstenholme 1990; Richardson 1991; Kim 1993). *Balancing loops* describe well naturally occurring control processes such as temperature and acidity. If conditions in an organism move out of the tolerable range of naturally occurring control parameters, then control action is taken through balancing loops to reestablish standard conditions. For example, when you feel hot, control action triggers off sweating that leads to cooling through convection, keeping your body temperature below life threatening levels. *Amplifying loops* on the other hand lead to a growth in a trend. This may be desirable or undesirable. Diversification in the growth of an embryo might be considered desirable. Addiction where more and more heroin is needed to achieve the same impact may be considered undesirable. An organism achieves a steady-state, or normal condition, through the interplay of balancing and amplifying feedback loops. The end result is an emergent whole with an overall integrity, albeit a finite one.

Von Bertalanffy (1956, 1981) generalised the open systems concept for other fields of study in what he called general systems theory. The lasting impact of his ideas, however, became known as systems thinking. Systems thinking was enthusiastically taken up as the basis of a new form of social theory.

Taken into the field of organisational analysis, for example, systems thinking sees organisations as complex systems made up of interrelated parts most usefully studied as an emergent whole. An organisation is open to its environment. Management action is taken to hold the organisation in a steady-state through management functions that control activities and information within the organisation, and between the organisation and its environment. The primary aims are to ensure survival and then to secure desirable growth, by transforming inputs and by adapting to changes when they occur. Since parts comprise people, management is concerned with the needs of people at work. Parts, or subsystems, have lists of needs that must be met. Individual motivation therefore requires attention. For example, jobs can be enriched leading to increased productivity and satisfaction. A whole organisational structure that reflects the interrelated nature of its subsystems holds greater potential for participation. System orientated leadership, therefore, is more able to encourage people's involvement, to enable democracy, and to provide conditions for autonomy.

Cybernetic theory is a stream of systems thinking that came together around the same time as Bertalanffy's path-breaking research. The core ideas relevant to action research are presented in the next section.

Cybernetic Theory

Cybernetics is traditionally defined as the science of communication and control in man (*sic*) and machine. It shares an interest in many of the concepts of systems thinking such as feedback and control. Cybernetic models represent dynamic phenomena conceptually, diagrammatically and/or mathematically, employing balancing and amplifying loops. Cybernetics found its home in the management sciences, for example, in the guise of control theory, systems engineering and, more recently, information theory. The field took

shape after WWII in the famous Macy conferences on cybernetics held in the USA. Key participants in these conferences included John von Neumann, Warren McCulloch, and Norbert Weiner. Another founding participant was Bateson (see 1973, 1979) and he has attracted considerable interest in the literature of action research.

Bateson in partnership with Margaret Mead undertook studies in anthropology and the dynamics of social relationships. They all but discovered cybernetic theory before its articulation at the Macy conferences. In the 1930s in New Guinea they observed social entropy where in certain social contexts opposition dialectically heightened between people leading to a breakdown in relations. This can be likened to von Neumann's game of competitive maximization (an amplifying loop). In Bali in the 1940s they observed balance through propriety in social relationships (an example of balancing loops at work).

Bateson subsequently hypothesised a general theory of cybernetics as his studies broadened into psychiatry and evolution. He envisioned unity in structure, for example, where structure in plants is found in the construction of sentences. This is similar to von Bertalanffy's general system theory. Bateson examined all sorts of pattern and order and linked them to modes of organisation and communication. He employed organic analogies as dynamic models to facilitate learning. He drew no defining line between natural and social arrangements and ultimately concluded that patterns and order in nature come together in certain ways in mental activity. The human mind thus is both a part of nature and a distinct thing.

This article so far has assisted the reader to get to grips with the origins and main concepts of systems thinking. With these sorts of idea firmly in mind, open systems theory and cybernetics began to influence practice and this endeavour became generally known as applied systems thinking.

Applied Systems Thinking

I first turn to Checkland's (1985) general model of the organised use of rational thought. It offers a means by which to understand applied systems thinking and a mode for its comparison with other systems approaches presented later on in the article. Checkland argues that research may be thought of as entailing three elements; (a) some linked ideas in a framework, (b) a way of applying these ideas in a methodology, and (c) an application area. After employing a methodology there is reflection on what has been learnt about the three elements. Modifications might be called for. We will see this to be the case as the article unfolds, revealing revisions that led to a better understanding of the potential of the systems idea in a liberating praxis.

The framework of ideas that characterises applied systems thinking makes the assumption that there are systems in the world. Applied systems thinking tends to concentrate on the structure of functional units. It focuses on intrinsic or relative stability of structures. The number of subsystems could well feature in the framework of ideas. A typical concern is how and under what conditions system transformation will occur. Another is the impact of internal stability on relations with other systems. It follows that the application area is characterised by management problems that occur in these systems. When a problem crops up, it is necessary to enter the system to carry out an intervention on it. The methodology then is an intervention that begins with problem identification and concludes with some final solution and an expectation that things will reach a desirable condition. The challenge is to find the most efficient means to achieve a predefined end. Often, systems models are constructed to predict consequences of intended actions and in

this way they support choice of an optimal action to meet a desired solution (known as feedforward control). Many examples of systems intervention are built on these principles (e.g., Atthill 1975; Jenkins 1969; M'Pherson 1981). The contribution of MIT's Jay Forrester, more than most, has left a giant sized impression on applied systems approaches.

Forrester (1961, 1968, 1969, 1971) created a line of systems thinking originally known as industrial dynamics, nowadays referred to as system dynamics. System dynamics is concerned with creating models of real world systems, studying their dynamics, and improving problematic system behaviour located through the models (Wolstenholme 1990). Early applications were industrial but subsequently broadened into large-scale studies and even global behaviour (e.g., Meadows et al. 1972).

System dynamics creates diagrammatic and mathematical models of feedback processes of a system of interest. Models represent levels of resources that vary according to rates at which resources are converted between these variables. Delays in conversion and resulting side-effects are included in models so that they capture in full the complexity of dynamic behaviour. Model simulation then facilitates learning about dynamic behaviour and predicts results of various tactics and strategies when applied to the system of interest.

Senge studied system dynamics under Jay Forrester at MIT. However, Senge (1990, 1994) through his book *The Fifth Discipline* achieved mega-popularisation of system dynamics as it contributed to organisational learning. A learning organisation is one that continually expands its capacity to create its own future. Senge argues that five disciplines underpin learning organisations: systems thinking, personal mastery, mental models, shared vision, and team learning. The fifth discipline is systems thinking that provides substance to the other four disciplines and hence to the learning organisation as a whole.

Systems thinking in personal mastery helps us to see our connectedness to the world and to more and more of the interdependencies between our actions and our reality. Systems thinking applied to mental models exposes assumptions that we make and tests if these are systemically flawed, for instance, by identifying feedback not previously accounted for. Systems thinking promoting shared vision clarifies how vision radiates through collaborative feedback processes and fades through conflictual feedback processes. Systems thinking through team learning identifies both positive and negative synergy in dialogue where, respectively, the whole becomes greater or less than the sum of its parts. Senge's ideas and other more recent studies in system dynamics arguably are on the border of systems thinking and systemic thinking.

Systems thinking found its way into action research, initially yielding what has been called a socio-ecological perspective.

Socio-Ecological Perspective

The socio-ecological perspective is a derivative of and is sometimes known as the open systems thinking school. Whilst growing out of open systems theory, it is shaped by psychoanalytic thinking and an action orientation (Greenwood and Levin 1998). Greenwood and Levin in a helpful summary of the historical roots of the socio-ecological perspective, locate its origins in research carried out by The Tavistock Institute of Human Relations. Working with Tavistock, Trist and Bamforth (1951) in their famous study on the longwall coal-mining method showed the importance of understanding interrelatedness between production technology and work organisation. The longwall method fragmented the work cycle on each shift in a reductionist manner. This lessened rather than improved productivity. There was a lack of compatibility between demands created by the

technology and needs of the workers as a group of interrelated human beings. Interrelatedness had been neglected and an impoverished outcome emerged.

Greenwood and Levin go onto explain how the industrial democracy movement came out of this and other early Tavistock studies. Further developments involved Kurt Lewin's (1948) concept of natural experiments and action research, which feature strongly in methodologies derived from the Tavistock program of research. A Norwegian, Einar Thorsrud, and an Australian, Fred Emery, also made significant contributions. It is the contribution to action research made through the partnership of Emery and Trist that I concentrate on below (the Emery-Trist paradigm, see Baburoglu 1992; Trist et al. 1997).

The socio-ecological perspective takes the open systems principle as its intellectual framework of ideas. It characterises this principle in a particular way (see Barton and Selsky 1998, which is drawn upon in the following discussion). A system is defined by the 'system principle' (i.e., the organising principle), which can be used to characterise the intra- and interrelationships existing in and between a system and its environment. These relationships are referred to as 'lawful relationships' reflecting the view that systems and individuals are capable of knowing about their environments (task environments and extended fields) in contrast to von Bertalanffy's view that environments are essentially random. Of particular interest to the socio-ecological perspective is the notion of a shared social field of organisational action, understood in terms of lawful relationships.

The socio-ecological perspective posits that the environment has an identifiable 'causal texture'. The four-step classification of these textures is presented in a classic paper by Emery and Trist (1965) that culminates in the most volatile texture, the turbulent field. Turbulence comes about through decisions and actions of managers in specific firms from a particular industry. These create mutually reactive chains as decision-makers respond and adapt to each other's decisions. Each decision-maker mobilises their own competitive tools to pursue their own objectives. Behaviour is constrained by tacit agreements about the rules of competition, where rules are what decision-makers can expect of each other. A situation (system and environment) can become particularly volatile when unintended consequences of individual actions build up, become linked in unexpected ways, and change the character of the environment itself. This is likely to occur in politicised, pluralistic, and fragmented circumstances.

An important focus in socio-ecological thinking is what emerges at system levels larger than an organisation. Pollution, poverty, and economic and political stability are obvious examples. Organisations may respond to such occurrences in many ways. In turbulent conditions that prevail today, the socio-ecological perspective suggests that collaborative arrangements, in which resources can be pooled among dissimilar kinds of organisation sharing an environment, may quell turbulence.

The socio-ecological framework of ideas manifests in a number of methodologies referred to in the literature of action research, including active-adaptive planning (Baburoglu 1992), participative design workshops (Emery 1989) and search conferences (Emery and Purser 1996). The process of these methodologies aims to establish a common understanding between participants based on the framework of ideas just introduced.

Greenwood and Levin (1998) point out that there are many interpretations of these methodologies and no one approach is correct. Each one has its own version of the framework of ideas, methodology, and action area. Indeed, Greenwood and Levin's mode of operating a search conference suggests something quite different in these three elements than so far discussed. They propose a form of liberating praxis that reflects systemic thinking. Nevertheless, I intend to continue the discussion for now in the mould of systems thinking so that I can illustrate how it has been employed as an approach to action research.

An organisation-orientated search conference based on systems thinking typically begins by establishing preliminary boundaries of the system and its environment. This enables things to move forward. Boundaries may be updated at any stage, as understanding of the system becomes clearer. Boundary identification focuses on interrelatedness of actors. A simple 'actor archetype' might include shareholders, employees, suppliers, competitors, and governmental agencies. The next step is to articulate lawful relationships between actors in the system, between the system and the environment, and in the environment. Value propositions are formulated. For example, a customer value proposition could focus on price, image, and personal relationships (Kaplan and Norton 1996). A search conference seeks to achieve alignment of value propositions by referencing to ideals through dialogue, but note, this cannot be achieved without first negotiating a clear value set that co-joins actors of the system. The process of discourse about value propositions surfaces things that need attending to and results in solid strategies and action plans.

Although offering an important development in human thought, the concepts and principles of systems thinking as such have been subjected to considerable criticism. The next section very briefly outlines some key questions raised about the validity of systems thinking in social organisational contexts. It sets the context for the emergence of systemic thinking and my subsequent presentation of two main systemic approaches.

Systems Thinking in Social Organisational Contexts

One of the main concerns with systems thinking is that a social model built on biological concepts places too much emphasis on structure and function. (We might exclude here the Emery-Trist paradigm that is based on a contextualist rather than organic root metaphor, where the unit of analysis arguably is 'the historical event,' not 'the organism'; cf. Pepper 1943.) Very little is said about processes that go on in social affairs, such as cultural activities, political trading and power struggles. Perhaps the biological view offers some contribution in terms of a social arrangement that might be particularly suited to one situation or another. However, there are many alternative views that promise to yield even more insight into social affairs (see Morgan 1986). That is, there is a wealth of different ways of defining human activity. Many texts have dealt with these and other criticisms of systems thinking (e.g., Checkland 1981; Jackson 1991).

Thus, results arising from systems thinking, such as organisational boundaries and purpose, inevitably turn out to be controversial. Choice of the most efficient means to achieve some given end (purpose) will also encounter split opinion. Admittedly, this criticism assumes that systems models are employed as representational tools purporting to represent reality, whereas they could be used as hermeneutic tools in meaning construction. In principle this defense may hold. In practice, however, it has to be said that for as long as people operate with a view of the world, or, in Checkland's terms, an intellectual framework of ideas, in terms of real social systems, systems models are bound to be used as representational tools. The view of the world must change first.

Systems thinking is an influential mode of thought that today remains the commonly held view of what the systems idea has to offer. As we now go onto discover, that view is far from an accurate or fair assessment of what systemic thinking has to offer. With systemic thinking there is growing rejection of the notion of a concrete social world that comprises real social systems, as people come to appreciate a quite different systemic quality to their existence. Writers such as Peter B. Checkland, C. West Churchman, as well as many others, began to argue from a systemic perspective that 'human systems' are

different. Checkland (1981) from a soft systems viewpoint contends that 'human systems' are better understood in terms of emergent systems of meaning people ascribe to the world. Systemic thinking is thus useful in meaning construction. Churchman (1968, 1979) from a critical systemic perspective pleads that it is not possible to think about 'human systems' as emergent systems of meaning without encountering serious moral dilemmas. To appreciate 'human systems' in action research therefore requires learning and understanding about emergent systems of meaning and moral dilemmas that emerge when they interplay through human interaction. These are important themes that come through with force in the remainder of this article.

Soft Systems Thinking

One way of distinguishing systems thinking from systemic thinking is that the former assumes knowledge is objective whilst the latter assumes it is subjective. Systems thinking attempts to be objective believing that there are real systems in the world that can be identified and improved. Systemic thinking is different.

Soft systems thinking is a form of systemic thinking that understands reality as the creative construction of human beings (Jackson 1991). It sees social reality as the construction of people's interpretation of their experiences. In this way it is firmly linked to interpretive theory. Soft systems thinking therefore generates and works with an evolving appreciation of people's points of view and intentions. Systems concepts are employed in the process of meaning construction, reflecting an intuitive assumption that the world is indeed systemic.

Soft systems thinking defines situations through action concepts (Checkland 1981; Checkland and Scholes 1990). Its intellectual framework of ideas might be described in the following way. People have intentions that lie behind each action that they perform. Neither observation nor theory provides sufficient understanding to be sure of those intentions, i.e., what is happening. For example, a high level of excitement observed in a person's actions might be theorised as threatening or conversely joyous behaviour. It is necessary to progress beyond observation and theory to come up with an 'authentic' explanation about what is going on in the minds of people and hence action that might be taken that is meaningful to them.

Soft systems thinking argues that a specific action concept becomes transparent only in the deeper context of a certain set of social rules. It is in these terms that an actor can be said to be doing some particular thing. Social rules lead to a social practice, that is, ways in which people live and work together. Lying behind social practice is constitutive meaning. Constitutive meaning 'puts in' meaning to the social practice, since it is the fundamental assumption that underlies what is done and what makes it meaningful. An 'authentic' understanding of people's actions may be constructed in this way.

To get to grips with the whole therefore involves the construction of understanding in terms of constitutive meaning, social practices and actions taken. Systems models or indeed any other model may be employed in heuristic fashion to see if they generate insight and assist in the construction process. With soft systems thinking, however, models must never be taken as representations of reality. Each model is employed like 'a pair of spectacles' through which we can 'look at and interpret reality'. Such interpretive thinking is systemic in outlook, not when it employs systems models, but when it helps all involved to interpret people's lives as an emergent whole by uncovering what is meaningful to them in terms of social rules and practices and underlying constitutive meaning. Of course, the

argument goes onto say that systems models are likely to be particularly useful in achieving meaningful understanding.

Furthermore, to achieve a meaningful understanding of any situation, it is necessary both to study the cultural aspects of the context as well as the interpretations and perceptions that people form within the cultural context. Soft systems thinking therefore states that an 'authentic' understanding of any action context requires participation of all stakeholders, that is, all people involved in taking action as well as people affected by those actions. This may be achieved only if people enter into an action context as both an actor and a researcher. Participation of stakeholders is a pillarstone of soft systems thinking and action research. It is an important example of a deep relationship that exists between systemic thinking and action research (e.g., see Checkland and Poulter 2006 *Learning for Action*).

Soft systems thinking provided the intellectual foundations for a number of methodologies relevant to action research (apart from Checkland's work, see for example Ackoff 1974, 1981; and Mason and Mitroff 1981). I have chosen to review soft systems methodology in the next section as an important representative of this tradition.

Soft Systems Methodology

The most thoroughly documented and discussed methodological example of soft systems thinking is soft systems methodology (SSM, Checkland 1981; Checkland and Scholes 1990; Checkland and Holwell 1998; Checkland and Poulter 2006). It thus is an important representative of the soft systems tradition. SSM is typically introduced as a seven-stage process in the fashion rehearsed below.

Stage 1 suggests that a problem situation (the action area) might arise that a number of people feel uncomfortable with. They wish to explore the situation with a view to making some improvement. The problem situation is expressed with Stage 2, attempting to avoid structuring the problem situation that would close down original thinking and hence learning. Conceiving the problem situation as a system in the manner of a search conference would, in Checkland's view, put in structure to thought before learning had had a chance to unfold in a creative fashion. Rich pictures are advocated as one suitable means of expression. They are cartoon type representations that allow people to express their experiences and, as is the case with cartoons, accentuate points that stand out in their minds.

Stage 3 recommends systemic thinking about the real world. The transition to Stage 3 is made by naming possible human activity systems that may offer insight into the problem situation, and may generate debate leading to action to improve the problem situation. A human activity system is a systemic model of the activities people need to undertake in order to pursue a particular purpose. Stage 3 develops root definitions of relevant systems. Root definitions are built around the world-view that states the constitutive meaning underpinning the purpose of a human activity system. The transformation process is then conceptualised. Customers, actors and owners, are subsequently named. Environmental constraints are taken into account. Construction of root definitions therefore embraces customers (C), actors (A), transformation processes (T), world-view (W), owners (O), and environmental constraints (E)—that can be recollected with the CATWOE mnemonic.

Stage 4 elaborates on root definitions by drawing up conceptual models. Conceptual models in the first instance are the minimum set of verbs (action concepts) necessary to describe the actions of the human activity system, which was seeded in a relevant system,

and grown in the root definition. The verbs are ordered systemically, drawing out the feedback loops that describe the interactions of the human activity system. Conceptual models, which are the result of systemic thinking about the real world, are taken into the real world in Stage 5, where they are compared to the problem situation expressed in Stage 2. Debate is generated whereby world-views inherent in conceptual models are thoroughly questioned and their implications understood. The conceptual model is also employed to surface possible change proposals.

With Stage 6, the change proposals are thought through in two ways. First, the *desirability* of the human activity system captured in the systems model is raised and discussed. Second, the issue of *feasibility* is explored in the context of the problem situation, attitudes and political interactions that dominate. Stage 7 seeks to explore possible accommodation between contrasting opinions and interests that surface in the process of SSM. Implementation of agreed upon change proposals gives rise to another problem situation and so the process of SSM continues.

As Checkland's action research program continued, a maturing appreciation of a framework of ideas, methodology, and action area became evident. Checkland and Scholes (1990) separated out two modes of SSM in action. Mode 1 SSM is as just described. It is the explicit application of SSM to guide action research. However, Checkland and Scholes reasoned that practitioners are immersed in an organisational context on a day-by-day basis, and surely could benefit from SSM principles in this greater portion of their working lives. SSM is not just about one-off action research; it may also help people to make sense of the rough and tumble of everyday affairs. If internalised, SSM affords the opportunity for action researchers to reflect on their experiences and to make some sense of them. There is a need for Mode 2 SSM.

Mode 2 SSM is a conceptual framework to be incorporated in everyday thinking. The main feature of Mode 2 SSM is recognition of two equally important strands of analysis—a logic-based stream of analysis and a stream of cultural analysis. The *logic-based* stream of analysis encourages practitioners to investigate the situation they are in, to look for new opportunities, and to seek ways to achieve accommodation between people, thus closing the gap that may exist between them. The stream of *cultural analysis* is an intertwined inquiry into the action research itself. It is both a 'social systems' analysis and a 'political systems' analysis. Three things are focused upon. First is the action research itself, exploring the role of the client, problem owners, and problem solvers. Second, 'social systems' analysis looks at roles, norms, and values as they influence behaviour. Third, 'political systems' analysis investigates political interaction, coalitions, and the use of power as it makes an influence on decision-making.

Soft systems thinking and methodologies like SSM that are consistent with interpretive thinking have made a considerable contribution to practice. Concerns have been raised, however, that systemic thinking suggests more than just streams of cultural and political analysis. The next section recounts some of the main points that have been raised.

Soft Systems Thinking in Social Organisational Contexts

Soft systems thinking made a clear break with the idea of systems of structure in the world. With soft systems thinking the entire effort becomes a matter of getting to grips with meaning construction through systemic concepts. In so doing, it confines change in social situations to changing people's world-views. However, systems thinking may yet have a point to make. A strong case can be made that structures in the world do exist, such as

economic and political ones, and that these are responsible for the perpetuation of social arrangements. It may be necessary if change is desired to recognise these structures, and then to transform them in advance of, or at least in conjunction with, changing people's world-views.

Furthermore, any approach that arguably is embedded in interpretive thinking as its intellectual framework of ideas is in the firing line of criticisms aimed at relativism. That is, if meaning is purely a matter of interpretation, then every viewpoint must be considered equally valid. In that case, exploring world-views to generate mutual understanding can and perhaps should go on forever. The troubling question that this observation leads to is how then can we move from debate to a pragmatic action research? What seems to be inevitable is that closure of debate leading to action will come from prevailing power structures reflected in the dominant culture of the organisational arena in which debate is undertaken (Jackson 1991).

Following on, the main criticism of soft systems thinking is that it neglects certain difficulties in achieving open and meaningful debate. Critics note, for example, that SSM has little to say in its principles about knowledge-power and the way that this distorts the outcome of debate (Flood and Jackson 1991a; Jackson 1991). Checkland offers some response to the criticism. He recommends 'political systems' analysis as part of the 'cultural stream of analysis'. Still, this adaptation barely touches upon the notion of knowledge-power and social transformation. It fails to acknowledge the full potential of systemic thinking for a liberating praxis. A new approach to systemic thinking called critical systems thinking emerged in the 1980s with these concerns firmly on its agenda.

Critical Systems Thinking

Critical systems thinking (CST) is a term established in the systems community that refers to a wide range of research and practice (see Flood and Jackson 1991a). There is no single approach or set of principles that defines what is CST. However, critical systems thinkers find integrity in their diversity through a number of core commitments. The first of course must be a commitment to *the systems idea*. Ways in which the systems idea is employed in critical systems thinking is multifarious and unravels in the presentation below. Critical systems thinking embraces a further five major commitments (Jackson 1991): critical awareness, social awareness, human emancipation, theoretical complementarity, and methodological complementarity.

Critical awareness comes in two forms. The first is by surfacing and questioning assumptions and values inherent in any systems design (e.g., Ulrich 1983). The second explores the strengths and weaknesses and theoretical underpinnings of systems methodologies and associated methods and techniques (e.g., Flood and Jackson 1991b).

Social awareness is about appreciation of social rules and practices that make acceptable, or not, modes of practice in society. For example, it recognises dominance in western societies of the scientific method and its insistence on learning through generalisations. The cultural mode that is science creates an obstruction to action research and its way of handling learning, which comes by transfer and adaptation of research findings from one context to another.

Human emancipation expresses a concern for people's well being as well as development of their potential. These two qualities of human existence can become severely restricted in modern day societies. First, people may feel that they have become instruments of reengineering in today's drive for efficiency and effectiveness. Second, people

may feel that there is little meaning to them in participatory work practices when intra-psychic forces (Argyris and Schön 1996) and cultural forces invisibly shape outcomes. Third, people may sense limits to and unfairness in the roles predefined for them by the might of knowledge-power.

Theoretical complementarity must follow the concerns of human emancipation for two very good reasons. First, critical systems thinking must not itself slip into the knowledge-power trap creating its own conventional wisdom. Second, the scope of issues raised in the last paragraph cannot easily be addressed by just one systems approach. The brief critiques of systems thinking and soft systems thinking from earlier in this article illustrate that there are limitations to any one framework of ideas. What is required is a complementary and informed development of all varieties of the systems approach (Jackson 1991; Mingers and Gill 1997).

Methodological complementarity sits side-by-side with theoretical complementarity. As Checkland (1985) argues, each framework of ideas brings with it methodological principles for action. Critical systems thinking recognises the need for different sets of methodological principles for each of the three concerns about human emancipation raised above (e.g., Flood and Jackson 1991b).

Making something of these commitments in the domain of practice presents a considerable challenge. Thankfully, the six commitments of critical systems thinking sit strong in the minds of a community of researchers who continue to explore ways and means of realising the commitments in practice (e.g., see the collection of papers in Mingers and Gill 1997; Jackson 2003).

In summary, the argument of this section is that systemic thinking, when taken to its practical conclusion from a critical systemic perspective, offers to action research a somewhat unique liberating praxis. The liberating praxis, however, will remain a hollow one in the absence of a certain kind of 'spiritual' awareness that is suggested by wholeness.

Beyond Fragmentation

The preceding sections are orientated toward an appreciation of systemic thinking in everyday action research. However, when focused on human existence as such, systemic thinking helps people to sense a deep holistic or spiritual quality to human existence. In other words, with systemic thinking we may attain a deeper sense of how we fit in with the scheme of things. Churchman (1982) intuitively sensed this in his writings on systemic thinking, wisdom and hope, ideas that many people have found inspirational. The 'spiritual' quality of systemic thinking, however, became easier to grasp in an everyday sense with the materialisation of a new form of systemic thinking called complexity theory (e.g., Cilliers 1998; Coveney and Highfield 1995; Mitchell 2009; Page 2010; Waldrop 1992). Complexity theory explains that the vastness of interrelationships and emergence in which people are immersed is beyond our ability to establish full comprehension. Complexity theory thus offers a systemic logic that purports to explain why human understanding will forever be enveloped in mystery. It leads us to know of the unknowable (Flood 1999). Once this idea is grasped, a systemic appreciation of 'spiritualism' then envelops the entire human experience and consequently everything that happens within that experience, including action research. We can learn more about spiritualism in systemic thinking by revisiting discussions on reductionism.

Reductionism, let us be reminded, advocates analysis of phenomena, which means breaking them down into constituent parts and then studying these simple elements in

terms of cause and effect relationships. The reductionist way arguably has demonstrated a relevance to the physical world. That part of the world we know as non-living things to an extent can be learnt about in terms of physical relationships of cause and effect. Scientific knowledge of this sort has made possible new ways of living moulded by technological developments in an era of modernisation. Science and technology aim to bring things under control, to achieve 'progress', in order to improve the human condition. Some of these developments might well be considered impressive. Yet, 'technological progress' has led to changes in our biological and social behaviour that some people experience as oppressive. For example, it seems that some people are doomed to a life of drudgery as a result of monotonous work in mechanised factories and computerised offices. Oppression of this kind often results from managers' obsession with technology under their control, rather than the technology itself. These technocrats have lost touch with people and this includes their own self. Modern living it turns out has in certain senses led to impoverishment rather than improvement of the human condition.

What this all boils down to, is that science through reductionism has in our minds fragmented the world, our existence, and our thoughts about how we might manage ourselves. The richness and mystique of life and living is deflated to a mental model with an unrealistic and mind blowing simplicity of the type, 'A caused B'. This alienates so-called parts, for example you and me, from patterns and rhythms of life in which we participate. It separates so-called 'problems', apparently caused by you or me, from the complex dynamics of each unique context. As a result we become subjects of language and observations like, 'I know that you caused this problem'. People are blamed in this way and are then found guilty in the kangaroo court of reductionism. Meanwhile, the blame mentality is further consolidated in NIMO denial, that is, 'the cause of that problem was Not In My Office'. People, especially those with formal power, find it convenient to detach themselves from patterns of interrelationships and emerging 'problems' to which they in fact have a systemic relationship and moral responsibility (people in power can decide what happens to other people). Reductionism, so the argument goes, leaves people out of touch with their own self, other people, and indeed any sense of the human spirit.

A systemic view may assist in healing people from this kind of wretched alienation (Reason 1994). A systemic view recognises a 'spiritual' quality that modern living lacks. In its essence, a deep systemic view pictures each person's life as a flash of consciousness, in existence, and of existence. What a person is, is what everything else is. Thus, a person looking out at the world is in a sense the world looking at itself. Such a view leads to a perception of wholeness, not of individuals and objects. Yet, wholeness cannot easily be analysed and then logically explained because, taking our definition of analysis from the Introduction, that involves reduction, which of course will denature any sense we have of wholeness. Very quickly we will lose touch with wholeness in a trivialised account of its assumed to be properties. So, let us just say that wholeness begins with an intuitive grasp of existence reflected in the words of this paragraph and take things from there.

A most convincing intuitive grasp of existence and hence wholeness is located in the opening chapter of Reason's (1994) *Participation In Human Inquiry*. Reason captures the reader's attention using as a backdrop Berry's (1988) *Dream of the Earth*. Berry we are shown writes of a systemic existence in a mood of spiritualism as he observes that, "we bear the universe in our being as the universe bears us in its being." Berry remarks that, "the two have a total presence to each other and to that deeper mystery out of which the universe and our selves have emerged." Reason enriches the scene as he observes that the human race is indeed no alien species suddenly transported to this universe and deposited on Earth. In a quite literal sense, human beings come from Earth. Because of this, he

observes, "phenomena as wholes never can be fully known for the very reason that we are part of them, leading us to acknowledge and respect the great mystery that envelops our knowing." In other words, not only might you and I know of one's self and the world in terms of wholeness, but also, our grasp of wholeness will be bounded, partial and subjective. For that reason our lives forever will be shrouded in mystery.

Therefore, seeking absolute mastery over our lives, as science and technology do, misses the point of wholeness and takes away our human spirit. It turns the magic of mystery in our lives into the misery of failed mastery over our lives. The point is that complexity emerges in our lives that the human mind is no master over. In fact, the human mind is both the creator and the subject of complexity, not an externally appointed master over it and all its parts. That is why it makes no sense to separate action from research in our minds or in our practice.

So, there is a need in everyday living and at work to maintain a balance between mystery and mastery. This entails operating somewhere between the hopelessness of the belief that we are unable to understand anything and, at the other extreme, the naiveté of the belief that we can know everything. Balancing mystery with mastery means to know of, yet to learn and act within the unknowable that is wholeness (Flood 1999). And here, with these words, I finally locate what I believe to be the conceptual convergence of systemic thinking and action research. It is through systemic thinking that we know of the unknowable. It is with action research that we learn and may act meaningfully within the unknowable. Where these two arcs of reasoning converge, we witness the incredible genesis of a conceptual universe that opens up otherwise unimaginable ways in which people may live their lives in a more meaningful and fulfilling manner.

Conclusion

Systemic thinking is a mode of thinking that keeps people in touch with the wholeness of our existence. It helps to keep in mind that human thought is not capable of knowing the whole, but it is capable of 'knowing that we don't know'. This is a pretty significant step forward in human understanding. Such recognition spotlights the futility let alone the hostility of traditional forms of practice based on prediction and control, which are so prominent in today's social organisational arrangements. It is futile because any social dynamic will always remain beyond control. It is hostile because it attacks people's spiritual well-being by isolating us and treating us as separate objects, rather than appreciating patterns of relationship that join us all together in one dynamic.

Systemic thinking clarifies these and other matters. However, systemic thinking is not an approach to action research, but a grounding for action research that may broaden action and deepen research. That is, action research carried out with a systemic perspective in mind promises to construct meaning that resonates strongly with our experiences within a profoundly systemic world. If systemic thinking delivers on this promise, then modern people may at last sense of our existence on Earth that we belong here, together, perhaps not in idyllic harmony, but at least with thoughtful tolerance.

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