Blending systems thinking approaches for organisational analysis: reviewing child protection in England

It is advisable to refer to the publisher's version if you intend to cite from the work. See Guidance on citing.

To link to this article DOI: http://dx.doi.org/10.1016/j.ejor.2015.10.041

www.reading.ac.uk/centaur

Innovative Applications of O.R.

Blending systems thinking approaches for organisational analysis: Reviewing child protection in England

David C. Lane [a,*], Eileen Munro [b], Elke Husemann

[a] *Henley Business School, Reading, United Kingdom*
[b] *London School of Economics and Political Science, London, United Kingdom*

ARTICLE INFO

ABSTRACT

This paper concerns the innovative use of a blend of systems thinking ideas in the 'Munro Review of Child Protection', a high-profile examination of child protection activities in England, conducted for the Department for Education. We go 'behind the scenes' to describe the OR methodologies and processes employed. The circumstances that led to the Review are outlined. Three specific contributions that systems thinking made to the Review are then described. First, the systems-based analysis and visualisation of how a 'compliance culture' had grown up. Second the creation of a large, complex systems map of current operations and the effects of past policies on them. Third, how the map gave shape to the range of issues the Review addressed and acted as an organising framework for the systemically coherent set of recommendations made. The paper closes with an outline of the main implementation steps taken so far to create a child protection system with the critically reflective properties of a learning organisation, and methodological reflections on the benefits of systems thinking to support organisational analysis.

1. Introduction

This paper goes 'behind the scenes' of a Government-initiated review of a sector of the public services in England: the child protection system. The 'Munro Review of Child Protection' employed a blend of systems thinking approaches to examine the activities, culture, effectiveness and social relations of the child protection sector. We go beyond the officially reported outcomes of that Review to give an account of the OR methodologies and processes used.

The paper proceeds as follows. We introduce the structure and problems of the child protection system. We then describe the approach taken by the Review, concentrating on its use of systems ideas. We turn to three contributions that systems thinking made to the Review and the resulting recommendations. We close the paper with a report on implementation and with methodological reflections on the utility of systems approaches.

2. Setting the scene

Here we describe the context of the work discussed in this paper. We introduce the child protection system in England, describe the

daily, risk-balancing judgements that have to be made and outline some of the concerns that had arisen regarding the functioning of the system.

2.1. Child protection

In England, the child protection system – or just 'child protection' - is a collection of primarily state-administered services involved in protecting vulnerable children and young people from harm and promoting their welfare. This includes investigating cases of maltreatment and intervening in such cases. Here 'maltreatment' includes neglect (a failure to safeguard from harm or provide for basic physical and psychological needs), psychological/emotional abuse, physical abuse and sexual abuse (Waterhouse, 2008). Although the system concerns itself with 0–18 year olds, for simplicity we use 'child' and 'children' throughout.

In England child protection is led by local government, which is responsible for the children in its area and which employs social workers in dedicated 'Children's Social Care' departments. However, 'child protection' also involves a range of other public agencies (schools, health authorities, police) and voluntary organisations. Local government therefore has a statutory responsibility to convene 'local safeguarding children boards' (LSCBs) with the aim of co-ordinating 'multi-agency working' to safeguard and promote the welfare of children. Child protection activities are overseen by the Department for

* Corresponding author. Tel.: +118 378 4285.
E-mail address: d.c.lane@henley.ac.uk (D.C. Lane).

Education and inspected by Ofsted (Office for Standards in Education, Children's Services and Skills).

The scale of activities is noteworthy. Within a twelve months period, for a population of 12.3 million 0–18 year olds, the statistics for Children's Social Care show that there were: 607,500 referrals (reports of concern from a range of individuals); 390,600 'Initial Assessments'; 141,500 'Core Assessments' (more detailed explorations of the problems); and 35,700 'Child Protection Plans' put in place (packages of measures aimed at safeguarding children in the family environment) (DfE statistics quoted in Munro, 2010, p. 27 & footnote 37).

Safeguarding children from all forms of maltreatment is the overarching aim. The most extreme form of maltreatment leads to child death. Reports from LSCBs show that during this one year period there were 20 cases in which a child died because of 'deliberately inflicted injury, abuse or neglect' (Department for Education, 2010c).

2.2. Judgement and the inherent risk balance

Not only is the scale of child protection work considerable, at the level of individual cases it is an extremely difficult job to do. To discharge their responsibilities social workers can, for example, apply to courts to remove a child from his or her parents. This is a profoundly intrusive act which should only be undertaken after careful consideration but it indicates the stakes in this area of social policy. At the heart of child protection work is the need for social workers to choose correctly in each specific situation between two very different responses: 'family preservation' and 'child rescue', and to balance the inherent risks of each (Mansell, Ota, Erasmus, & Marks, 2011). A 'family preservation' emphasis tends to seek ways to keep children with their families. A 'child rescue' emphasis may remove children at a lower threshold. Errors in judgement in either direction have serious repercussions.

Social workers daily face the difficult task of finding the correct balance of judgement. To do this, they aim to spend time with family members so as to establish a relationship of trust and to understand what is actually happening. Making judgements on which approach is best for a particular child is difficult; as the then Parliamentary Under-Secretary of State for Children and Families observed, "We often face our social workers with the judgment of Solomon as to whether it is better to bring a child into care" (Loughton, 2010).

2.3. Emerging concerns

Whilst professionals endeavour to make fine judgements, errors do occur. These are of concern to local and central government. A particular additional feature of the child protection area is that some cases of maltreatment, and particularly the most extreme ones involving child deaths, are also taken up in the media and generate strong critical public reactions. These frequently involve public condemnation, both of the particular social workers involved and the profession in its entirety.

Generally, a range of concerns had emerged about the state of child protection in England. Overall, there was a feeling that all was not right in the sector. There was low public esteem for the social work profession, low staff morale and serious problems in recruitment and retention so that this challenging area of work was being done increasingly by less-experienced social workers.

There had been efforts to improve the quality of professional practice. A prime mechanism designed to correct problems in the sector was the 'Serious Case Review'. These take place when a child dies or is seriously injured and maltreatment is thought to be a factor. The 'local safeguarding children board' must appoint an independent reviewer who examines the parts in the case played by various agencies and organisations. The purpose of an 'SCR' is to understand what happened and to investigate professional practice with the aim of improving it in the future. However, these SCRs were widely seen not to

be working (Brandon et al., 2009). Whilst they kept finding the same problems with practice (Reder, Duncan, & Gray, 1993), there were "divergent views … [and] … different perspectives" about the cause of these problems (Rose & Barnes, 2008, p. 70). What many recommendations shared was an emphasis on, "reviewing or strengthening existing procedures or developing new procedures" (loc. cit.).

It was in this complex environment that the Munro Review was initiated.

3. The Munro Review: use of systems thinking and general structure

Eileen Munro is an academic and former social worker. She was invited by the Secretary of State for Education to "conduct an independent review to improve child protection" in England (Department for Education, 2010b). The invitation stated that, "the system of child protection in our country is not working as well as it should. We need fundamentally to review the system" (*ibid.*) and in June the Parliamentary Under-Secretary of State for Children and Families announced the Review's launch to Parliament (Department for Education, 2010d). In this section we describe the blend of systems thinking-related approaches that were central to the Munro Review and then outline the Review's general structure.

3.1. Application of systems thinking in the Review

Munro had previously argued that, in child protection, it was necessary to take a broad view of the contexts in which humans make decisions – to treat it as a 'system' (Fish, Munro, & Bairstow, 2008; Munro, 2005b; 2005a). Whilst her approach to the Review was wide-ranging in terms of topics, methodologically she hoped to find a 'systems thinking' method which would bring this insight to life and play a central analytical role.

Systems approaches derive their analytical capability from mechanistic roots (e.g. von Bertalanffy, 1972) but also address interpersonal relations in organizations. Hence, there are forms of systems thinking embracing socio-technical thinking (Emery & Trist, 1969), or explicitly rooted in interpretivism (Checkland, 1981). Systems approaches are effective for understanding complex situations; 'whole systems' tools which treat organisations in an holistic manner are widely used, for example, in public health management (Greenhalgh, MacFarlane, Barton-Sweeney, & Woodward, 2012; Midgley, 2006; Pratt, Gordon, & Plamping, 1999). There is a now a wide range of different systems approaches which are used with a critical understanding of the underlying assumptions, limitations and strengths of each (Jackson, 2003; Keys, 1988; Mingers, 2015). In consequence, a range of systems thinking approaches was introduced by Lane and Husemann and these were then blended together and employed at the heart of the Review. We introduce these approaches here.

Munro sought an 'holistic' method to analyse the thinking behind previous policy recommendations, as well as the 'ripple effects', or unintended consequences and feedback loops, of those policies. She wanted a method that would reveal both why the well-intentioned reforms of previous years had been proposed and why they seemed not only to have failed to produce the intended improvement but also created new problems. The ideas of intended and unintended consequences relate, respectively, to teleology and teleonomy - central ideas in systems thinking (Checkland, 1981), indicating that a systems perspective was required. A range of systems mapping approaches is available (Lane & Husemann, 2009; Mingers & Rosenhead, 2001). Here, the focus on causal mechanisms and behaviour over time, combined with the wish to consider anticipated and unanticipated consequences of policy initiatives, indicated a central role for system dynamics modelling.

Originally created by Forrester, system dynamics focuses on causal mechanisms to provide an effective means of understanding why

social systems behave over time in a given way and how different policies can change that dynamic behaviour (Forrester, 1961, 1968b). Benefiting from technical roots in servo-mechanism theory, system dynamics helps organizational actors to experiment with different policies (Lane, 1999). Using the concept of feedback loops, qualitative maps and/or computer simulation, models are employed to articulate and represent the mental models of those wishing to craft policy for such systems. The field has become increasingly interested in organisational learning (Senge, 1990), in "cognitive and affective issues" (Edmondson, 1996, p. 582), and the creation of intersubjective meaning (Lane & Husemann, 2008). The technique of 'group model building' is particularly effective in addressing such concerns (Vennix, 1996). This participative approach to map/model creation can help generate an agreed conceptualisation of the problem (Andersen, Vennix, Richardson, & Rouwette, 2007), allow people to share both thoughts and feelings about different policy options (Rouwette, Korzilius, Vennix, & Jacobs, 2011) and help build consensus (van den Belt, 2004).

There is also appreciable interest in moving from atomistic, hierarchical and authoritarian organisational forms to ones in which holistic understanding combines with flat organisational structures and intrinsic motivational effects to enable a 'learning organisation' (Forrester, 1965, 1971; Ghaffarzadegan, Lyneis, & Richardson, 2011; Rahmandad, 2008; Senge, 1990; Senge & Sterman, 1992) .

Two other sets of systems ideas were also employed. The first, from cybernetics, is the concept of 'requisite variety' which proposes that complex situations can only be managed effectively when an appropriate range of possible actions is available (Ashby, 1956; Conant & Ashby, 1970). The second set, from organizational development, derives primarily from the works of Argyris (Argyris, 1982, 1990; Argyris & Schön, 1978) and explores interpersonal causal reasoning, single and double loop learning and the unintended, sometimes self-reinforcing, consequences of policies. We shall return to these two sets of ideas in more detail when describing their use in Sections 4–6.

Though introduced sequentially here, for the Review these systems thinking ideas were blended together in an innovative way. In fact, these ideas have considerable overlap. For example, Edmondson (1996) argues for significant similarities between Argyris' ideas and those of system dynamics. Such overlap indicated the natural fit of these different approaches and their blending together proved to be a powerful way of gaining the best from each approach in order to understand the complexity of the child protection system. In general methodological terms the work therefore relates to the OR tradition of mixing different methods – as discussed later.

3.2. General structure

'The Munro Review of Child Protection' was supported by civil servants based in the Department for Education. It drew on a 'Reference Group' of individuals with direct experience and knowledge of the sector: a Director of Children's Services, a judge from the Family Proceedings Court, two academics specialising in child protection and social care, the Chief Executive of a leading children's charity, a consultant paediatrician with responsibility for children in the Department of Health, an adoptive mother with experience of fostering more than 100 children, and two young people who had themselves been through the child protection system.

The work was organised into eight strands: Early Help, Rules and Guidance, Children and Young People, Courts, ICT, Learning from Practice, Media and Public Confidence, and Performance and Inspection. Each of these sub-groups was peopled by individuals (some from the Reference Group) of similar stature and experience. Evidence collection followed these strands, with evidence calls issued on 1st July (Munro & Davis, 2010). 'Evidence' ranged from numerical data to first-hand experiences of: workers in child protection, children, managers, police officers, teachers and other professionals.

The following sections give an account of how systems thinking shaped the policy advice that was generated by the Review.

4. Using and advocating systems thinking

The Review was public in its use and advocacy of systems thinking. The aim was to "look back at past reforms to explain what has happened, with systems theory providing a strong basis to build the Review's understanding" (Munro, 2010, p. 10). To do this, the first report advocated systems thinking and described the broad relevance of its underlying theory. During the Review, systems thinking was used to consider a large number of factors as well as links between factors. As an example of this, we undertook an analysis of the broad effects of past policies. We consider that example in this section.

4.1. Unearthing a compliance addiction

We used systems thinking to analyse the macro effects of past recommendations. We drew on published research, expert interviews conducted in the early phases of the Review, other qualitative and quantitative evidence, and further expert comment from the Reference Group. We talked to people knowledgeable about child protection, eliciting and visualising their views. Whilst the primary systems tool was a 'causal loop diagram', or CLD (Forrester, 1968a; Lane, 2008), other ideas helped illuminate what we unearthed.

Previous recommendations had led to an emphasis on creating or strengthening procedures (Rose & Barnes, 2008). The aim was apparently to improve performance by controlling the detailed operations in the sector. The result was a vast increase in Government guidance and procedures; by 2010 one key document was 55 times longer than its 1974 version (Parton, 2011). Unsurprisingly, there was also a view that "[p]rofessional practice and judgement … are being compromised by an over-complicated, lengthy and tick-box assessment and recording system" (Laming, 2009, p. 33). What systems mapping unearthed was that this prescriptive approach had contributed to the emergence of a compliance culture.

Using an aggregate representation of the sector, the compliance culture was seen to proceed from the assumption that a prescriptive approach is effective (Fig. 1, extreme right). This produced a high target level of prescription. Compliance enforcement increased. Increased prescription of what constituted the 'right thing to do' meant that the 'scope' that child protection staff had for their work decreased. Increased 'Compliance with Prescriptions' was then the proximal effect.

The resulting balancing loop B1 is the first of two feedback loops that embody ideas from Argyris. Balancing loops are learning loops; they monitor what is going on, detect errors and departures from implicit and explicit goals and enact corrective action. Argyris (1982) sees single loop learning as error correction which takes for granted the underlying goals and policies. Loop B1 accomplished this teleological task, monitoring what was going on and operating to produce an intended consequence: procedures operating as prescribed.

However, pursuing compliance also had distal effects which rippled through the system along chains of causality.

First, reducing social workers' scope for using their professional judgment reduced their sense of satisfaction derived from work because they lost their professional autonomy. This increased turnover, reduced experience levels and reduced public esteem for the profession (Fig. 1, bottom). These consequences were supported empirically by, for example, data on morale levels, resignation rates, time in post etc. The underlying mechanisms are consistent with work showing that enriched job design yields increased performance and staff satisfaction, and reduced absenteeism (Wood, van Veldhoven, Croon, & de Menezes, 2012), whilst the effects themselves are consistent with findings on regulation, commitment, self-esteem, exhaustion and staff turnover (Lapointe, Vandenberghe, & Panaccio, 2012).
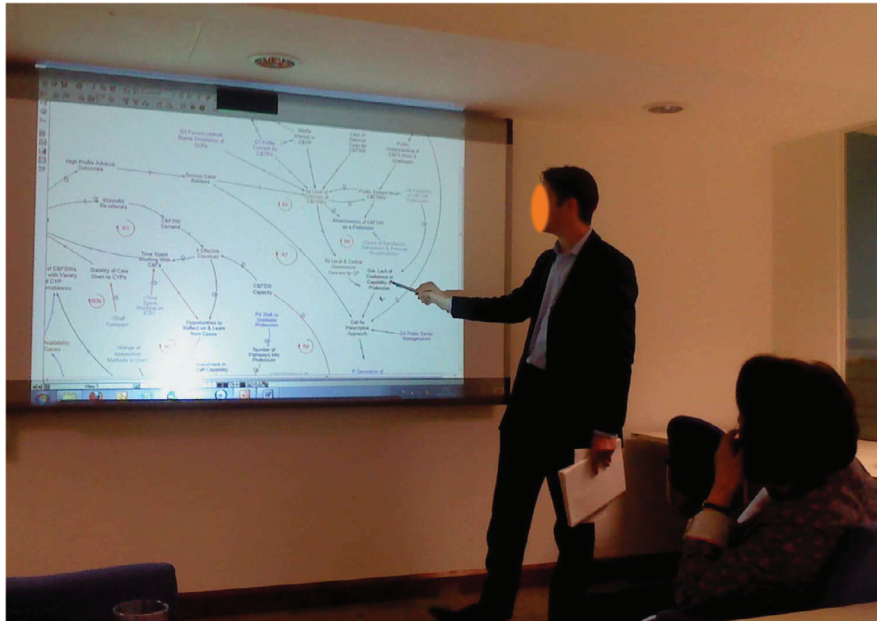
Fig. 1. Causal loop diagram illustrating the intended and unintended consequences of a prescriptive approach to child protection and the emergence of a compliance culture. Arrows labelled 's' represent causal influences which, *ceteris paribus*, cause changes to the influenced variable in the same direction, whilst 'o' labels indicate changes in the opposite direction. From Lane and Munro (2010).

These ripple effects were not anticipated and certainly not welcome. Yet they were not 'side effects', in that they were no less 'effects' than those originally intended. Rather, they were telenomic effects, effects that the policies were not meant to produce but which nevertheless resulted from the complex connections in the system. They were unintended consequences.

A second ripple effect arose as prescription reduced the range of approaches used with children and the quality of interventions was reduced too (Fig. 1, top left). The consequences were interpreted using the idea of 'Requisite Variety': policy in a controlling system must have available a variety of responses that is as great as the variety of circumstances it seeks to control (Ashby, 1956; Conant & Ashby, 1970). Children are found in a very wide variety of circumstances and a 'one size fits all' approach to working with them lacks the flexibility required to supply the help that is needed. Hence, as the 'scope' available to social workers reduced, so the quality of help that their interventions provided reduced. Errors are made. Sometimes they can relate to cases involving very serious harm or death. Such errors should lead to reflection and learning via a second feedback loop, B2. This is an example of double loop learning; error correction which can question and even change underlying goals and policies. Via this loop the system had the opportunity to examine whether it was correct to sustain a belief in the effectiveness of prescription.

However, the history of the sector shows that prescription has increased. This is seen as resulting from the error correction mechanism of B2 being undermined via a third ripple effect.

An inability to learn from failures is reported in many settings; a range of factors has been identified (Tucker & Edmondson, 2003). With child protection, a compliance culture made it possible to avoid the lesson of errors. For example, the evidence indicated that the existence of detailed procedures offered a ready defence against allegations of failure: one demonstrated that procedures were followed. The mechanisms operating in the compliance CLD were seen as a manifestation of Argyris' 'Model O-I: limited learning systems' (Argyris, 1982). In a combination of 'camouflage' and 'defensive rou-

tines' (Argyris, 1990), the potential learning loop B2 faltered as the ability of the sector to acknowledge errors reduced. The sector did not experience double loop learning, did not learn from the events or examine the possible deficiencies of a highly prescriptive approach.

In fact, the diagnosis indicated an additional, more significant effect. Prescription became increasingly attractive to a sector scared of being pilloried in public. 'Handling' errors via the deflective action of arguing that procedures were followed produced an escalation of commitment to the effectiveness of a prescriptive approach, reinforcing loop R in Fig. 1 (centre right). In a vicious circle, the sector created a self-defence mechanism which disregarded errors but also extended "a tick-box culture that may … look good on paper despite all the shocking evidence to the contrary" (Batty, 2008). This can be seen as a case of 'escalating error' (Argyris, 1982) and the feedback loops of the system dynamics 'addiction' structure (Meadows, 1982).

The result of this use of systems thinking ideas is therefore a plausible explanation of the behaviour observed: an intention to use prescription created a compliance culture which ignored the limitations of prescription, indeed, which led the sector to experience some form of organisational addiction to prescriptive approaches.

4.2. Advocating systems thinking

The compliance addiction analysis made various contributions. Munro recalls that it helped her begin to see how previous reforms of the sector had not had the desired effect of improving services while they had continued down the path of increasing prescription.

The CLD appeared in the first report (Lane & Munro, 2010). An animated presentation was prepared entitled 'Learning But Not Learning in Children's Services' which others could use to 'tell a story'. We used it on a leadership programme at the National College for Leadership of Schools and Children's Services in December 2010 and subsequently provided it to a number of participants at their request.

The compliance addiction CLD was easy for people to understand and generated overwhelming support from the sector. The general

Fig. 2. Group modelling conducted during the Review: participants developing the large systems map.

reaction was, 'Yes, this picture is what we see happening'. Staff who had shown the presentation to their teams reported the same response. In later stages of the Review's consultation processes numerous participants referred to this diagram in just those terms. In these ways this piece of systems thinking created confidence in the sector regarding the direction of the Review and came to be seen as an important element in the creation of trust between those conducting the Review and those working in child protection.

This was one example of the report's general advocacy point: that because it facilitated both thinking about the whole as well as the parts, and the application of double loop learning, a systems approach to child protection was necessary and would be used in the subsequent stages of the Review. To advance this case a table in the report contrasted an atomistic approach to child protection with an holistic approach. The interim report reproduced this table and went on to identify the 'holistic' column as "the approach towards which the review advocates that the system moves" (Munro, 2011b, p. 77).

This broader advocacy was also received well. Many appreciative emails were sent to the Review's secretariat in the Department for Education and to Munro herself. The Under-Secretary of State for Children and Families is reported to have "maintained that Munro's review had 'struck a chord' with the frontline social workers he had spent time with" (Garboden, 2010).

The Review's first report laid the ground for future work on the state of child protection. The task was now; "to look forward – with systems theory helping the Review design an improved approach … what is needed is a stronger understanding of the system and analysis of how aspects of the system interact with each other" (Munro, 2010, p. 10).

5. Mapping how child protection was working

A broader systems thinking contribution to the Review resulted from a detailed examination of child protection activities and their consequences. During the next phase, 'group model building' was used; this involves a series of facilitated meetings in which participants' ideas are represented using maps. The approach has many similarities with the participative approaches of 'soft OR' (Franco & Montibeller, 2010; Mingers & Rosenhead, 2004; Rosenhead, 1989), not least the idea that modelling work can have a broad range of

benefits that extend beyond analysis into the support of learning and the promulgation of shared understanding and commitment (Eden, 1995; Franco, 2013; Phillips, 1984). In the system dynamics field, whilst there is particular interest in the analytical benefits to be derived from that form of modelling, considerable thought is also given to the group process and to its benefits for participants (Forrester, 1971; Lane, 1992; Richmond, 1997; Vennix, 1996). This stage of the work was critical to the Review's ultimate recommendations. The process and methodology of the analysis are the subject of this section and of the following one.

5.1. Developing group understanding

Because of the fine granularity of this stage, and the aspiration to create a platform for exploring alternative policies, we started afresh and began building a new CLD with participants who provided a mix of policy, practice and academic experience. Eileen Munro was a 'virtual member': briefed on each meeting's results and offering queries for the next. Civil servants in the DfE provided relevant qualitative and quantitative data and we looked at data on the effect of organizational factors and working practices from other countries (Healy & Oltedal, 2010; Healy, Meagher, & Cullin, 2009; Mor Barak, Nissly, & Levin, 2001). Information elicited in the meetings was cross-referenced with evidence generated by the different strands. The symbols of causal loop diagramming proved straightforward for participants to grasp and they became proficient in expressing their ideas using them. When uncertainties or problems arose these were resolved by using the precision of the mapping language to create clarity and a shared view in the discussion, or by seeking out qualitative or quantitative empirical data that might support or challenge any contested assertions.

The group created a complex systems map of the social work profession which organized the wealth of information that was available (see Fig. 2). This looked in detail at the reasons for past recommendations and considered the effects of previous policy initiatives. The map contained nearly 60 variables, expressing the group's shared understanding of the highly complex web of relationships and interconnections. We cannot describe here all of the detail of this large CLD. Instead, we give an illustration of the detailed, event-based reasoning that was used in creating it and the diagnosis it generated.
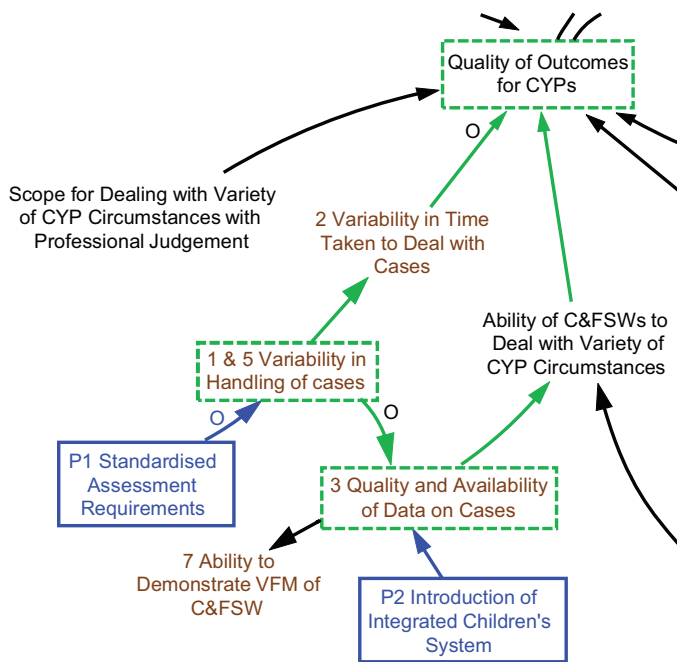
Fig. 3. Detail from the large systems map developed during the Munro Review. Emphasised here are: two policies that had been put in place (solid boxes) and their intended consequences (chain boxes). Arrows labelled 'o' represent causal influences which, _ceteris paribus_, cause changes to the influenced variable in the opposite direction, whilst unlabelled arrows indicate changes in the same direction. The large systems map used some acronyms not employed elsewhere in this paper: C&FSW – child and family social worker; CYP – child or young person.

5.2. Mapping problems, policies and effects

The sequence used to create the map involved first looking at 'problem', then 'policy', then 'intended effects'. Below we give an example of the reasoning used.

In the past, the sector had experienced high variability in the handling of cases. For instance, the following two problems occurred. Firstly, there were instances of initial and core assessments of cases being delayed, leaving children in potentially harmful situations. Second, comprehensive records of cases were not always kept. Now consider two of the policies put in place to deal with these problems (see Fig. 3). The first policy was the introduction of standardised assessment requirements which prescribed the way in which cases were handled. For example, initial and core assessments had to be done using prescribed forms and be completed within 7 days and 35 days, respectively. The second policy was the introduction of a case management software, the 'Integrated Children's System' (ICS). Provided to all regional children's services offices, this software had fixed work flows as a case moved through the organisation and a fixed set of fields, all of which required completion (White, Wastell, Broadhurst, & Hall, 2010).

The intended effects of these policies are clear. The requirement that initial and core assessments be completed within a fixed timescale would, _ceteris paribus_, improve the quality of outcomes for children by avoiding harmful delay in assessing their safety. Similarly, the introduction of ICS and the improvement in quality and availability of case data would, in principle, improve the ability of social workers to deal with cases. However, the final stage of the sequence used to create the map went further by looking at the 'unintended effects' of these policies (see Fig. 4).

The insistence on strict deadlines for assessments applied regardless of the complexity of the situation. Assessments were completed within the deadline even though social workers felt that they had not had time adequately to explore a situation. Staff expressed frustration

at not being able to spend the time on cases to develop a richer understanding or to craft an intervention package that would do the best for the child. Evidence from the 'early help strand' indicated a reduction in the quality of help given (Department for Education, 2010a). This policy also meant that staff had less scope for applying their professional judgement. This lowered the sense of satisfaction they felt and they reported disenchantment at knowing that they could have done a better job.

The requirement that case information be structured via the ICS data fields also had unintended effects. Time spent with families allows relationships to develop and nuanced judgements to be made, both increasing the quality of help given. Again, evidence indicated that because of ICS, staff spent more time at computers (Department for Education, 2010a). This was supported by previous work (Parton, 2005), and accounts of staff, "spending between 60% and 80% of their available time … at the computer" (White et al., 2010, p. 410). Additionally, this further reduced the satisfaction gained from work; staff saw the data entry requirements as needlessly burdensome.

5.3. The systems thinking diagnosis

The process illustrated above was applied across a wide range of child and family social work activities. To help make sense of the resulting complex systems map, we introduced into the discussion the concepts of 'requisite variety' and ideas from organizational development, primarily those relating to the self-reinforcing consequences of policies and the potential for single and double loop learning. These systems ideas proved effective in eliciting comment, in clarifying, debating and agreeing possible links and loops, and in developing a deeper shared understanding of what had happened in the sector. The group then applied system dynamics ideas of loop analysis. This meant looking at the feedback loops that were thought to be operating, identifying the reinforcing loops and balancing loops in the map and understanding how they might be influencing behaviour.

As a result of considering these detailed causal mechanisms, the group agreed that two sets of feedback effects were operating and identified four drivers of the sector which influenced these loops. The drivers are described in the next section. Here we consider the reinforcing loops and then the balancing loops.

First, the group concluded that there were nine reinforcing loops, operating here in a damaging way as 'vicious circles'. These resulted from 'ripple effects' curving round to amplify changes. The mechanisms combined factors involving culture or professionalism with effects concerning tangible resources (c.f. de Greene, 1973). In simplified versions, Fig. 5 illustrates two of these loops. For the purposes of this example we concentrate on effects relating to prescription. This was seen to reduce the quality of help given to children. It also reduced staff satisfaction with their work. In R1, low satisfaction increased sickness rates, increased the general workload and further reduced the quality of help given. In R2, low quality outcomes for children increased staff turnover, also increasing workload.

Two further vicious circles related to the broader environment described earlier. In one, reduction in the quality of outcomes led to high profile failures. The resulting criticisms reduced the attractiveness of the social work profession, making it harder to recruit staff able to produce good outcomes. High profile failures were also an element of a second loop. Low public and Government confidence in the profession and a failure to grasp the inherent uncertainty of child protection work motivated the application of a prescriptive approach.

A second set of effects concerned balancing loops. The group modelling produced agreement that these loops were currently not accomplishing their aim of allowing the system to put itself right.

One loop, influenced by several drivers of the sector, aimed to improve the quality of child protection by increasing prescription. That loop was operating. However, rather than improving the overall situation, this created the set of damaging reinforcing loops described
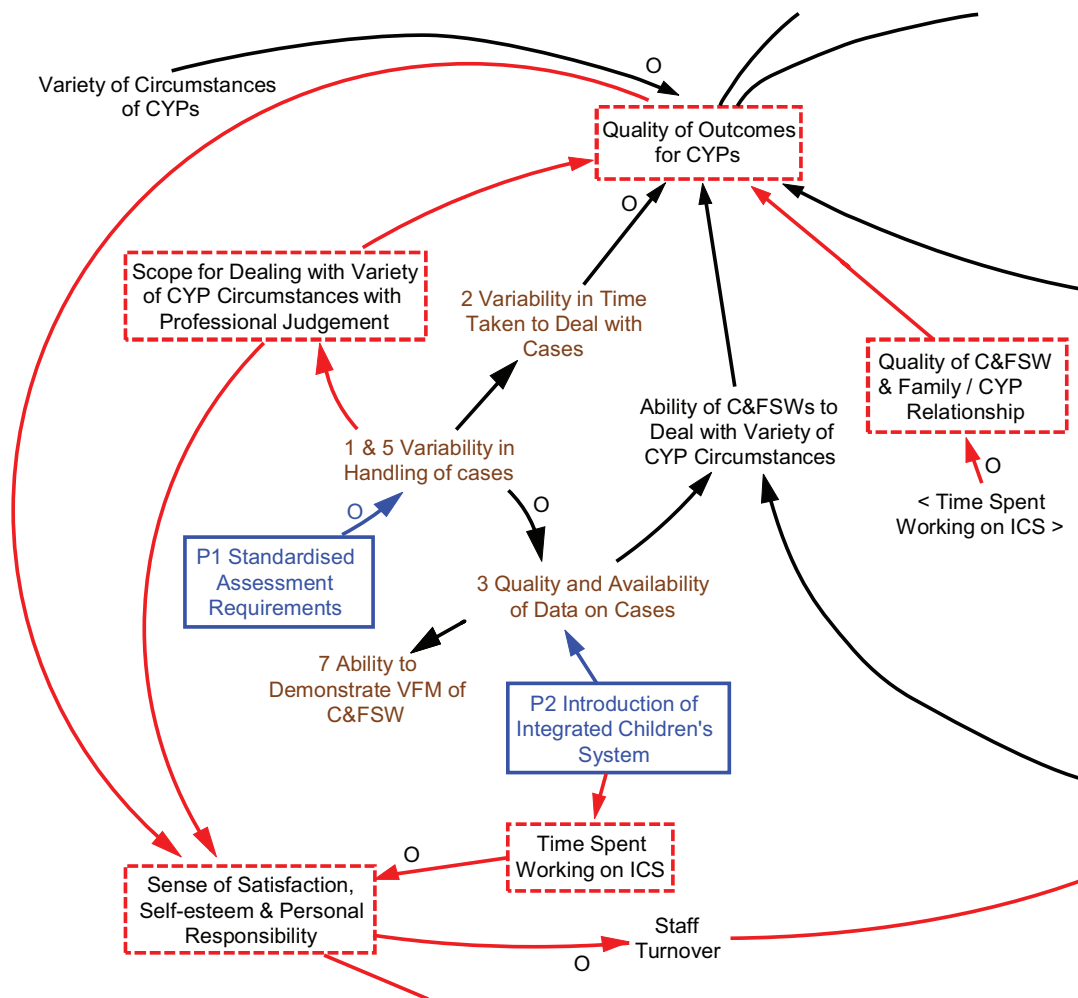
Fig. 4. Further detail from the large systems map. Emphasised here are: two policies (solid boxes) and, now added, their unintended consequences (chain boxes).

above. To the group, this gave insight into how prescription had tightened: a balancing loop, which by itself had the goal of producing a well-functioning sector, produced many of the unanticipated effects described earlier and generated reinforcing loops which resulted in adverse outcomes - and hence more prescription.

Another two balancing loops concerned the utility of Serious Case Reviews. The learning benefits of these loops were undercut in two ways (see also Sidebotham et al., 2010). First, the reviews tended to adopt a person-centred orientation, looking for errors in professional performance without examining the broader factors that contributed to the error occurring. In the group's opinion, Serious Case Reviews therefore produced few useful development points for the profession. Second, time pressures reduced the opportunities to reflect and learn from these cases. The conclusion was that what should have been powerful learning loops for the profession were operating in a weak, ineffectual manner.

The message of the work with the complex systems map may be summarised in terms of such reinforcing and balancing loops. A set of drivers and resulting policies had produced a sector in the grip of a set of 'vicious circles', whilst the balancing loop mechanisms offered no exit route, sometimes being too weak to have corrective results, sometimes contributing to the reinforcing effects. We discuss how this diagnosis was taken forward in the following section.

6. Shaping the integrated set of recommendations

We explored further the system map described above. The insights it produced, and their underlying reasoning, were also discussed at Reference Group meetings. This analysis gave shape to the issues the Review had to address and provided an organising framework for the recommendations made to Government.

6.1. Diagnosing the drivers of the sector

The systems thinking work revealed four drivers of the sector which were key in influencing the loops described above. First was the high level of public concern for the welfare of children and the strong reaction to serious injury or death. Second was an at times limited public understanding of the inherent uncertainty of child protection work. Third was the tendency of inquiries to invoke human error without examining the context and possible systemic causes. Fourth was an approach to improving professional performance through increasing rules and procedures allied to an audit system that primarily monitored compliance with procedures,

The systems thinking showed how this set of drivers, their interlinkages and the resulting policies had generated the situation described above. As the report states, "systems thinking has helped the review form a deeper understanding not only of *what* has been going wrong but *why* the system has evolved this way" (Munro, 2011a, p. 15).

6.2. Recommendations and their basis in systems thinking

Building on this systems-based explanation, the analysis generated 15 recommendations. These were directed at social workers and
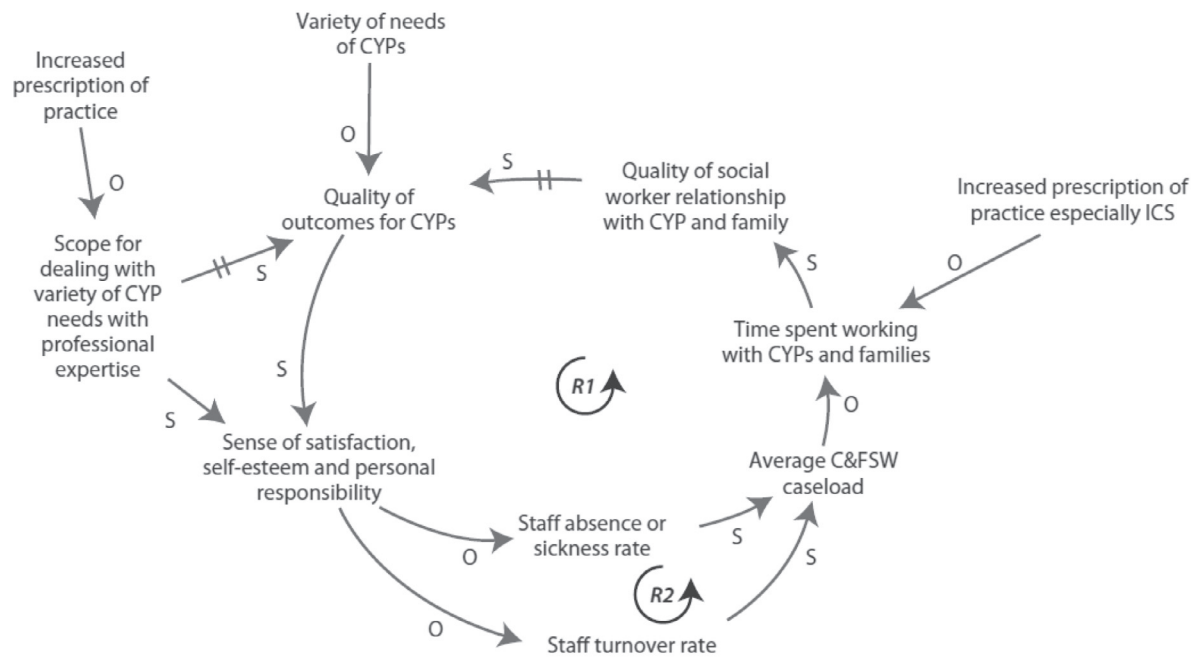
Fig. 5. Two 'vicious circles' that resulted from efforts to improve social work through increased prescription of practice. The double lines are a delay symbol which indicates that an effect will take longer to appear. From Lane and Munro (2011).

children's services but also at the wide range of agencies involved in child protection. At their core is the idea of creating a child protection system with the critically reflective properties of a learning organisation, moving from single to double loop learning, i.e. "instead of 'doing things right' (i.e. following procedures) … [focus] on doing the right thing (i.e. checking whether children and young people are being helped)" (Munro, 2011a, p. 6). Their intent was to, "mov[e] from a system that has become over-bureaucratised and focused on compliance to one that values and develops professional expertise and is focused on the safety and welfare of children and young people" (loc. cit.). Here we give a flavour of these recommendations, showing their roots in systems thinking.

They emphasised the need to value social work expertise and professionalism; rolling back prescription was a specific recommendation. The Government should do this by revising its policies and statutory guidance to the organisations involved in child protection in a way which distinguished essential rules from general guidance. The prescription of national performance indicators, assessment forms or approaches to IT systems should be seen as constraints on local innovation and professional judgement and should cease. Prescribed timescales for early assessment stages should be removed. Instead, a general principle of timeliness relative to a specific child's needs should be applied to all stages. From the perspective of the systems thinking analysis which produced the recommendations, the reduction of prescription aimed to increase the 'scope' available to social workers, allowing for more 'variety' in the system and so breaking the 'vicious circles' described earlier, possibly converting them to 'virtuous circles'.

Changes were recommended concerning how the child protection activities of a range of organisations should be evaluated by local safeguarding children boards (LSCBs). Statutory guidance should be amended to take into account local need and practice should be judged using evidence of children's progress. In systems thinking terms, this removed the concentration on measures of input or activity with their damaging feedback effects. Again, 'vicious circles' would be broken but also assessment of the help actually given to children would create a new balancing loop, helping the system learn about its effects.

There was a recommendation for, "a fundamental rethink of how to learn about professional practice through the [Serious Case Review] process" (p. 60). It was thought necessary to consider what underlying factors made professionals behave as they did, the broader factors 'Behind Human Error' (see Woods, Dekker, Cook, Johannesen, & Sarter, 2010). In line with the advocacy of systems thinking and with the aim of ensuring an holistic view of the context in which child protection work is done, the Review recommended that the Government require LSCBs to use some type of systems methodology whenever undertaking Serious Case Reviews. In this way the report sought to take a balancing loop thought to be ineffective and make it operate as an effective double-loop learning mechanism for the profession.

The recommendations also aimed to address the organizational context of child protection. At a macro level, to give the profession a face (for Government and the public), to improve understanding and to enhance its reputation, a new office 'Chief Social Worker for England' was proposed. This was intended to break, even reverse, a number of vicious circles. Closer to practice, local authorities were encouraged to use the newly collected information on the actual effect of social work activities on children to redesign their services, to be open to changing their approach as seemed appropriate. This relates to the learning loop referred to previously, a true piece of 'double-loop learning' which the report hoped to put in place.

6.3. Systems thinking at the core of the final report

The insights gained from systems thinking appeared in the final report primarily as text. It was in this way that the wealth of detail considered during the systems thinking analysis informed the report. The process and methodologies described in this paper remained very much behind the scenes. However, to illustrate both the approach used and the diagnosis it offered, the simplified CLD of Fig. 5 was included (Lane & Munro, 2011). In policy analysis terms, the systems thinking work ran throughout the report. Whilst traditional in form, the report's text aimed to address the many interacting factors in a manner consistent with the evidence gathered and the causal mechanisms thought to be operating. It offered a systems explanation of why the problems had arisen and why the system was

operating as it was and then built on this to offer a coherent set of recommendations for how to make the system behave differently.

Emphasising the need for an holistic view, the report stated that "[t]he recommendations are to be considered *together*, and the review cautions strongly against cherry picking reforms to implement" and reiterated that the suggested actions have interwoven consequences (Munro, 2011a, p. 10, italics in original).

The large systems thinking map generated as part of the Review's work was the tool that integrated the knowledge contained in the submissions received, interviews conducted and numerical data collected during the Review process. It was central to the creation of an holistic understanding of what was at fault, as well as being the tool that gave rigour and coherence to the Review's final recommendations to Government.

7. Implementation and methodological reflections

Here we describe the successful implementation of the work's recommendations and reflect on the role played by the blend of systems approaches used.

7.1. Implementation

The Government responded to the final report: five recommendations were accepted in principle, ten in full and timescales were given for implementation stages (Department for Education, 2011a). Reflecting the reach of the Review, the Minister wrote to the heads of agencies involved in child protection: Directors of Children's Services, police Chief Constables, heads of voluntary & community sector organisations, the Care Quality Commission, the NHS Confederation and the Royal College of Nursing. He stated that "The Government accepts [Munro's] fundamental argument" and outlined how it would support the "move towards a child protection system with less central prescription and interference, where we place greater trust and responsibility in skilled professionals at the front line" (e.g. Department for Education, 2011b, p. 1).

In Parliament the Minister subsequently offered evidence of 'good progress', describing how statutory guidelines were being simplified and new arrangements for Serious Case Reviews piloted in Coventry and in Lancashire using systems methodologies to increase learning (Department for Education, 2011c).

A new inspection framework shifted the focus away from processes on to the effectiveness of help for children and families (Ofsted, 2012). Inspectors must look beyond written records; they are now required to talk to social workers, observe practice and seek the "Views of children, young people, parents and carers" (op. cit., p. 11).

A progress report identified changes and called for faster progress and attention to the holistic nature of the recommendations (Munro, 2012). It welcomed, *inter alia*, that, "trial authorities … report that the additional flexibility has encouraged better, more thoughtful working practices, and better and clearer consideration of priorities" (op. cit., p. 3).

Revised statutory guidance came into force (Department for Education, 2013b). This reduces prescription, replacing 700 pages with 100 pages. It concentrates on rules for co-operation between the different organizations and agencies involved in child protection but leaves most other activities to the professionals themselves. For example, the hard timescales for assessment have gone. Instead, staff are expected to use judgement and, "see the child within a timescale that is appropriate to the nature of the concerns expressed at referral, according to an agreed plan" (p. 30).

A Chief Social Worker for Children was appointed (Department for Education, 2013a).

Internationally, the Review's ideas have also received attention in other child protection jurisdictions that have experienced similar drift into a compliance culture for example, in New South Wales (Department of Family and Community Services, 2012, 2013) and the Isle of Man (IOM Today, 2011).

7.2. Methodological reflections

The Review used systems ideas to analyse the situation, to diagnose what had gone wrong and to formulate a coherent set of recommendations for changes. It also endorsed systems thinking as a means of embedding those recommendations in the sector. Based on this experience, we offer three methodological reflections on the value of systems methods for understanding organisations.

First, a modelling approach has much to contribute. Research shows that unaided human thought generally rests on fairly short and simple causal explanations with few 'side effects', yet still struggles to infer dynamic consequences even from such simplified mental models (Axelrod, 1976; Dörner, 1996; Rasmussen, 1990). To improve matters, the insight that there are multiple elements, that interconnectedness matters, that a situation may usefully be thought of as a system, is certainly the first crucial step, the foundation for all that follows. However, the act of modelling can then bring that insight to life in new ways which allow a deeper level of analysis. Some form of abstract, formal representation can both capture knowledge in a generalizable way and allow that knowledge to be interrogated to produce and communicate new insights. It provides diagnostic power and a sound basis for organizational intervention. In this way, modelling aids both theory building and insight generalisation.

The work around the complex systems map supported a concentration on causal mechanisms. This enabled poor system responses to be diagnosed as the unanticipated effects of previous policies as well as the identification of the drivers of the sector. Understanding the feedback mechanisms in play then allowed experimentation with possible future policies and the creation of a coherent and mutually supporting package of recommendations for change.

Second, engagement with 'human factors' is vital. Whilst the technical elements must be acknowledged, "The technocratic view is faulty, not because it is incorrect, but because it is incomplete" (Tinker & Lowe, 1984, p. 45). Quite simply, this means that organizations must not be treated merely as mechanisms (c.f. Boulding, 1956). People matter. For example, correctly identifying important organisational concerns, and in a manner which will, "mobilize and sustain the effort" to deal with those concerns, requires stakeholder involvement (Nutt, 2002, p. 43). Similarly, the implementation of a proposed solution does not occur, "simply because it shines with self-evident truth" (Lane, 1992, p, 67).

The requirement is therefore to address not only the tangible complexity of tasks and their information management needs, but also individual responses and social relations. The combination of the two is critical. Soft systems methodology, with its stream of cultural analysis (Checkland, 1981; Checkland & Scholes, 1990), socio-technical system theory (see Emery & Trist, 1969; Mumford, 2006) or the participative approach of system dynamics (Forrester, 1971; Lane, 1992; Richmond, 1997; Vennix, 1996) are examples of this stance.

This stance was fundamental to the Review's systems thinking activities: the compliance CLD displays this combination, as does the approach taken to create and interpret the complex systems map. There is a broader point. The thrust of the recommendations involved a significant change in the sector's social relations, a move away from a fragmented conceptualisation of child protection towards one which involved more group working, which considered the whole child's journey, and which facilitated skills development for the individuals working in the child protection system.

Third, a blending of a number of different systems approaches can be helpful. Organizations are subtle and complex entities. Individual analytical approaches reveal different aspects and so several of them can produce a richer picture. This view relates to the 'complementarist' view in system science (Jackson, 1991; Jackson & Keys, 1984)

and also has connections with 'multimethodology' work on mixing OR methods (Eden, 1990; Howick & Ackermann, 2011; Mingers & Brocklesby, 1997; Mingers & Gill, 1997). This is why, as described throughout this paper, a central feature of the Munro Review was its use of a range of systems ideas, each designed to 'slice' reality at a certain angle and generate particular insights. It was the blending of those different approaches which proved effective.

To highlight one such aspect of the Review's work, a CLD allowed the rich detail of Argyris' 'escalation' idea and an understanding of the need for Requisite Variety, to be folded into Meadows' theory of addiction. All three then contributed to the compliance structure discussed earlier and the organisational diagnosis that it offered.

7.3. Closing remarks

A further perspective on the role played by the various systems approaches, and their effectiveness in implementation, comes from a senior civil servant reflecting on the work (Tiotto, 2014); "The systems modelling in the review, has led to many innovations and had a long and sustained impact."

On the benefits of OR processes and tools she records:

"The 'causal loop' thinking that was introduced early in the review helped civil servants, ministers and critically, leaders and frontline practitioners to think about reform of a whole system in which single actions would create chains of causality and ripple effects."

"The concept of single and double loop learning was critical to the long term beneficial impact of the review, in that it enabled those working in the system to understand the damaging effects of a compliance culture derived from single loop learning and the benefit of recalibration from feedback that is only possible with double loop learning."

"The 'unintended consequence' of a ripple effect is now in common parlance in social work, government innovation programmes and particularly in inspection and regulation … we have seen revised government guidance … and an inspection system that is now predicated on causality, ideas about requisite variety and feedback."

We would suggest that the application work described here exemplifies the effectiveness of blending systems approaches for addressing the complexity of real world organisations.

Acknowledgement

References

Andersen, D. F., Vennix, J. A. M., Richardson, G. P., & Rouwette, E. A. J. A. (2007). Group model building: problem structuring, policy simulation and decision support. *Journal of the Operational Research Society, 58*, 691–694.

Argyris, C. (1982). *Reasoning, learning and action: individual and organizational*. San Francisco: Jossey Bass.

Argyris, C. (1990). *Overcoming organizational defenses: Facilitating organizational learning*. Boston, MA: Allyn and Bacon.

Argyris, C., & Schön, D. (1978). *Organizational learning: A theory of action perspective*. Reading, MA: Addison-Wesley.

Ashby, W. R. (1956). *An introduction to cybernetics*. London: Chapman & Hall.

Axelrod, R. (1976). *Structure of decision: The cognitive maps of political elites*. Princeton: Princeton University Press.

Batty, D. (2008). *Paperwork is not social work*. The Guardian newspaper, 1st December.

Boulding, K. E. (1956). General systems theory - the skeleton of science. *Management Science, 2*, 197–208.

Brandon, M., Bailey, S., Belderson, P., Gardner, R., Sidebotham, P., Dodsworth, J., et al. (2009). *Understanding serious case reviews and their impact. a biennial analysis of serious case reviews 2005-07*. London: Department for Children, Schools and Families.

Checkland, P. B. (1981). *Systems thinking, systems practice*. Chichester: Wiley.

Checkland, P. B., & Scholes, J. (1990). *Soft systems methodology in action*. Chichester: Wiley.

Conant, R. C., & Ashby, W. R. (1970). Every good regulator of a system must be a model of that system. *International Journal of System Science, 1*, 89–97.

de Greene, K. B. (1973). *Sociotechnical systems: Factors in analysis, design, and management*. Englewood Cliffs, N.J: Prentice-Hall.

Department for Education (2010a). *Early intervention strand of the Munro Review - MUNRO early intervention september report final*. London: Department for Education.

Department for Education (2010b). Letter from Michael Gove to Professor Munro, 10th June. London: Department for Education.

Department for Education (2010c). *Main Tables osr17-2010v2 - Preventable child deaths in England: Year ending 31 March 2010*. London: Department for Education.

Department for Education (2010d). *Written ministerial statement on the launch of the Munro Review, June*. London: Department for Education.

Department for Education (2011a). *A Child-centred System: The government's response to the Munro review of child protection*. London: Department for Education.

Department for Education (2011b). *Letter from Tim Loughton to social workers - Munro Review of child protection: Government response*. London: Department for Education.

Department for Education (2011c). *Tim Loughton M.P. response to parliamentary question by Andrea Leadsom M.P. 13th december 086572 concerning progress he has made on implementation of the recommendations of the Munro report into child protection*. London: Department for Education.

Department for Education (2013a). *First ever chief social worker for children and fast-track training to lead social work reform (Press release)*. Available from https://www.gov.uk/government/news/first-ever-chief-social-worker-for-children-and-fast-track-training-to-lead-social-work-reform (Downloaded 17/06/2015).

Department for Education (2013b). *Working together to safeguard children: A guide to inter-agency working to safeguard and promote the welfare of children*. London: Department for Education.

Department of Family and Community Services (2012). *Child deaths - 2011 annual report: Learning to improve services*. Ashfield, NSW, Australia: Department of Family and Community Services, Community Services.

Department of Family and Community Services (2013). *Child deaths - 2012 annual report: Learning to improve services*. Ashfield, NSW, Australia: Department of Family and Community Services, Community Services.

Dörner, D. (1996). *The logic of failure: Recognising an avoiding error in complex situations (orig. Die Logik des Misslingens)*. New York: Metropolitan Books.

Eden, C. (1990). Part III: mixing methods- introduction. In C. Eden, & J. Radford (Eds.), *Tackling strategic problems: The role of group decision support* (pp. 90–91). London: Sage.

Eden, C. (1995). On evaluating the performance of 'Wide-band-GDSS's. *European Journal of Operational Research, 81*, 302–311.

Edmondson, A. C. (1996). Three faces of Eden: The persistence of competing theories and multiple diagnoses in organizational intervention research. *Human Relations, 49*, 571–595.

Emery, F. E., & Trist, E. L. (1969). Socio-technical Systems (re-print of 1960 original). In F. E. Emery (Ed.), *Systems Thinking: Selected readings* (pp. 281–296). Harmondsworth: Penguin.

Fish, S., Munro, E., & Bairstow, S. (2008). *SCIE Report 19: Learning together to safeguard children: Developing a multi-agency systems approach for case reviews*. London: Social Care Institute for Excellence.

Forrester, J. W. (1961). *Industrial dynamics*. Cambridge, MA: MIT Press.

Forrester, J. W. (1965). A new corporate design. *Industrial Management Review (now the Sloan Management Review), 7*, 5–17.

Forrester, J. W. (1968a). Market growth as influenced by capital investment. *Industrial Management Review (now the Sloan Management Review), 9*, 83–105.

Forrester, J. W. (1968b). *Principles of systems*. Cambridge, MA: MIT Press.

Forrester, J. W. (1971). "The" model versus a modelling "process" (republished 1985). *Dept. memo D1621-1, system dynamics group, MIT, republished in System Dynamics Review, 1*, 133–134.

Franco, L. A. (2013). Rethinking Soft OR interventions: models as boundary objects. *European Journal of Operational Research, 231*, 720–733.

Franco, L. A., & Montibeller, G. (2010). Facilitated modelling in operational research. *European Journal of Operational Research, 205*, 489–500.

Garboden, M. (2010). Munro should not consider cost, says Loughton. Community Care, 4th Oct, from: http://www.communitycare.co.uk/2010/10/04/munro-should-not-consider-cost-says-loughton/ (Downloaded 22/2/2014).

Ghaffarzadegan, N., Lyneis, J., & Richardson, G. P. (2011). How small system dynamics models can help the public policy process. *System Dynamics Review, 27*, 22–44.

Greenhalgh, T., MacFarlane, F., Barton-Sweeney, C., & Woodward, F. (2012). "If we build it, will it stay" a case study of the sustainability of whole-system change in London. *The Milbank Quarterly, 90*, 516–547.

Healy, K., Meagher, G., & Cullin, J. (2009). Retaining Novices to become expert child protection practitioners: creating career pathways in direct practice. *British Journal of Social Work, 39*, 299–317.

Healy, K., & Oltedal, S. (2010). An institutional comparison of child protection systems in Australia and Norway focused on workforce retention. *Journal of Social Policy, 39*, 255–274.

Howick, S., & Ackermann, F. (2011). Mixing OR methods in practice: Past, present and future directions. *European Journal of Operational Research, 215*, 503–511.

IOM Today (2011). *Review puts focus on care: An independent review of care proceedings is being planned, Tynwald was told (22 November)*. Available from www.iomtoday.co.im/news/isle-of-man-news/review-puts-focus-on-care-1-3990148 (Downloaded 17/06/2015).

Jackson, M. C. (1991). *Systems methodology for the management sciences*. New York: Plenum.

Jackson, M. C. (2003). *Systems thinking: Creative holism for managers*. Chichester: Wiley.

Jackson, M. C., & Keys, P. (1984). Towards a system of system methodologies. *Journal of the Operational Research Society, 35*, 473–486.

Keys, P. (1988). A methodology for methodology choice. *Systems Research, 5*, 65–76.

Laming, W. H. (2009). *The protection of children in England: A progress report*. London: HMSO.

Lane, D. C. (1992). Modelling as learning: a consultancy methodology for enhancing learning in management teams. *European Journal of Operational Research, 59*, 64–84.

Lane, D. C. (1999). Social theory and system dynamics practice. *European Journal of Operational Research, 113*, 501–527.

Lane, D. C. (2008). The emergence and use of diagramming in system dynamics: a critical account. *Systems Research and Behavioral Science, 25*, 3–23.

Lane, D. C., & Husemann, E. (2008). Steering without circe: attending to reinforcing loops in social systems. *System Dynamics Review, 24*, 37–61.

Lane, D. C., & Husemann, E. (2009). What does the arrow mean? Observations on system dynamics mapping and the potential for experimentation with other methods. In J. Strohhecker, & A. Größler (Eds.), *Strategisches und operatives Produktionsmanagement - Empirie und Simulation* (pp. 327–350). Wiesbaden: Gabler.

Lane, D. C., & Munro, E. (2010). Appendix 2: Applying systems thinking ideas to child protection. *The Munro Review of child protection part one: a systems analysis* (pp. 47–52). London: TSO.

Lane, D. C., & Munro, E. (2011). Appendix A: Analysis of impact of increased prescription in social work. *The Munro Review of child protection final report: a child-centred system* (pp. 136–138). London: TSO.

Lapointe, É., Vandenberghe, C., & Panaccio, A. (2012). Organizational commitment, organization-based self-esteem, emotional exhaustion and turnover: a conservation of resources perspective. *Human Relations, 64*, 1609–1631.

Loughton, T. (2010). *Evidence to Commons Select Committee on Education, 15th December (Examination of Witnesses, Questions 42–76)*. From: http://www.publications.parliament.uk/pa/cm201011/cmselect/cmeduc/678/10121503.htm (Downloaded 22/2/2014).

Mansell, J., Ota, R., Erasmus, R., & Marks, K. (2011). Reframing child protection: a response to a constant crisis of confidence in child protection. *Children and Youth Services Review, 33*, 2076–2086.

Meadows, D. H. (1982). Whole earth models and systems. *The Coevolution Quarterly*, 98–108 Summer.

Midgley, G. (2006). Systemic intervention for public health. *American Journal of Public Health, 96*, 466–472.

Mingers, J. (2015). Helping business schools engage with real problems: the contribution of critical realism and systems thinking. *European Journal of Operational Research, 242*, 316–331.

Mingers, J., & Gill, A. (Eds.). (1997). *Multimethodology: The theory and practice of combining management science methodologies*. Chichester: John Wiley & Sons.

Mingers, J., & Rosenhead, J. (2004). Problem structuring methods in action. *European Journal of Operational Research, 152*, 530–554.

Mingers, J., & Rosenhead, J. V. (Eds.). (2001). *Rational analysis for a problematic world revisited*. Chichester: Wiley.

Mingers, J. C., & Brocklesby, J. (1997). Multimethodology: towards a framework for mixing methodologies. *Omega, 25*, 489–509.

Mor Barak, M. E., Nissly, J. A., & Levin, A. (2001). Antecedents to retention and turnover among child welfare, social work, and other human service employees: what can we learn from past research? A review and metanalysis. *Social Service Review, 75*, 625–661.

Mumford, E. (2006). The story of socio-technical design: Reflections on its successes, failures and potential. *Information Systems Journal, 16*, 317–342.

Munro, E. (2005a). Improving practice: child protection as a systems problem. *Children and Youth Services Review, 27*, 375–391.

Munro, E. (2005b). A systems approach to investigating child abuse deaths. *British Journal of Social Work, 35*, 531–546.

Munro, E. (2010). *The Munro Review of child protection part one: A systems analysis*. London: TSO.

Munro, E. (2011a). *The Munro Review of child protection final report: A child-centred system*. London: TSO.

Munro, E. (2011b). *The Munro Review of child protection interim report: The child's journey*. London: TSO.

Munro, E. (2012). *Progress report: Moving towards a child centred system*. London: Department for Education.

Munro, E., & Davis, M. (2010). *Joint letter from Prof Eileen Munro and Marion Davis on call for evidence, 1st July*. London: Department for Education.

Nutt, P. (2002). *Why decision fail: Avoiding the blunders and traps that lead to debacles*. San Fransisco: Berret-Koehler.

Ofsted (2012). *Framework for the inspection of local authority arrangements for the protection of children*. London: Ofsted.

Parton, N. (2005). Changes in the form of knowledge in social work: from the 'social' to the 'informational'? *British Journal of Social Work, 38*, 253–269.

Parton, N. (2011). *The increasing length and complexity of central government guidance about child abuse in England: 1974–2010*. University of Huddersfield, Discussion Paper. Available from http://eprints.hud.ac.uk/9906/ (Downloaded 17/06/2015).

Phillips, L. D. (1984). A theory of requisite decision models. *Acta Psychologica, 56*, 29–48.

Pratt, J., Gordon, P., & Plamping, D. (1999). *Working whole systems: Putting theory into practice in organisations*. London: King's Fund.

Rahmandad, H. (2008). Effect of delays on complexity of organizational learning. *Management Science, 54*, 1297–1312.

Rasmussen, J. (1990). Human error and the problem of causality in analysis of accidents. *Philosophical Transactions of the Royal Society of London. Series B, Biological Sciences, 327*, 449–460.

Reder, P., Duncan, S., & Gray, M. (1993). *Beyond blame: Child abuse tragedies revisited*. London: Routledge.

Richmond, B. (1997). The strategic forum: Aligning objectives, strategy and process (originally published 1987). *System Dynamics Review, 13*, 131–148.

Rose, W., & Barnes, J. (2008). *Improving safeguarding practice: Study of serious case reviews 2001–2003*. London: Department for Children, Schools and Families.

Rosenhead, J. V. (Ed.). (1989). *Rational analysis for a problematic world: Problem structuring methods for complexity, uncertainty and conflict*. Chichester: Wiley.

Rouwette, E. A. J. A., Korzilius, H., Vennix, J. A. M., & Jacobs, E. (2011). Modeling as persuasion: the impact of group model building on attitudes and behaviour. *System Dynamics Review, 27*, 1–21.

Senge, P. M. (1990). *The fifth discipline: The art and practice of the learning organization*. New York: Doubleday/Currency.

Senge, P. M., & Sterman, J. D. (1992). Systems thinking and organizational learning: acting locally and thinking globally in the organization of the future. *European Journal of Operational Research, 59*, 137–150.

Sidebotham, P., Brandon, M., Powell, C., Solebo, C., Koistinen, J., & Ellis, C. (2010). *Learning from serious case reviews: Report of a research study on the methods of learning lessons nationally from serious case reviews*. London: Department for Education.

Tinker, A., & Lowe, A. (1984). One-dimensional management science: the making of a technocratic consciousness. *Interfaces, 14*, 40–49.

Tiotto, J. (2014). *Letter to the President of the Operational Research Society (Operational Research Society President's Medal - Systems modelling in the child protection system in England - Client recommendation), 4th July*.

Tucker, A. L., & Edmondson, A. C. (2003). Why hospitals don't learn from failures: organizational and pschological dynamics that inhibit system change. *California Management Review, 45*, 55–72.

van den Belt, M. (2004). *Mediated modeling: A system dynamics approach to environmental consensus building*. Washington Dc: Island Press.

Vennix, J. A. M. (1996). *Group model-building: Facilitating team learning using system dynamics*. Chichester: Wiley.

von Bertalanffy, L. (1972). The history and status of general systems theory. *Academy of Management Journal, 15*, 407–426.

Waterhouse, L. (2008). Child abuse. In M. Davies (Ed.), *The Blackwell Companion to Social Work* (3rd ed.) (pp. 18–26). Oxford: Blackwell.

White, S., Wastell, D., Broadhurst, K., & Hall, C. (2010). When policy o'erleaps itself: the tragic tale of the integrated children's system. *Critical Social Policy, 30*, 405–429.

Wood, S., van Veldhoven, M., Croon, M., & de Menezes, L. M. (2012). Enriched job design, high involvement management and organizational performance: The mediating roles of job satisfaction and well-being. *Human Relations, 65*, 419–445.

Woods, D. D., Dekker, S., Cook, R., Johannesen, L., & Sarter, N. (2010). *Behind human error*. Farnham: Ashgate.