How systems change
can enable transformational and sustainable improvements in people's quality of life and wellbeing

An overview of key literature

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May 2018

CONTENTS

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Section 1 Introduction

This paper is a tailored review and overview of key literature on the topic of systems change. It was prepared for the Life Changes Trust, a charity based in Scotland, to explore a question framed by the Trust as follows: **How can systems change enable transformational and sustainable improvement in people's quality of life and wellbeing?** The Trust commissioned this work to support reflection and learning to strengthen approaches and support for effective systems change in human welfare. The focus of the paper is on literature that is most relevant for services for people and for the human-created systems that bear most closely on their wellbeing. The methods used to prepare the paper are detailed in the Appendix.

The language of 'systems thinking' and 'systems change' as part of the effort to improve human welfare and wellbeing has become common currency in many sectors in recent years (Walker, 2017). There is an expanding scholarly and practice and policy literature. Yet the question framed by the Trust turns out not to lend itself to a straightforward answer. Many initiatives claim 'systems change' as one of their objectives, but not all efforts badged as systems change make convincing examples. Although there is a plentiful theoretical literature focused on big principles, there are no succinct definitions or short descriptions of what actual systems change looks like in practice, and few detailed analyses of how real world initiatives approach the task, what they do, and what happens along the way that can help to clarify for the new reader what we are dealing with. To some extent, this reflects the fact that systems change takes many forms, but it also reflects that the terminology is used in different ways by different writers. There is also rather little independently verified evidence of the concrete impact of systems change efforts.

This paper integrates theory with some real world examples of systems change interventions culled from a wide inter-disciplinary literature. The literature draws from the physical and natural sciences; social, psychological, behavioural and environmental sciences; from health, development, implementation and improvement science; from complexity science; and especially from organisational management and business sciences, where systems and how to influence them has been a subject of close scrutiny at least since the 1950s.

To understand real world examples of systems change and to explore them critically, it is first necessary to be understand the foundational constructs: what do we actually mean by a 'system' in a human welfare context, and what do people mean when they talk about 'systems change'? These questions turn out to be complex and subtle, and their difficulty perhaps explains why there are so many claims made to 'whole systems working' that do not stand up to careful examination. The American writers Pennie Foster-Fishman and colleagues (2007) in their excellent overview from the field of human services entitled *Putting the system back into systems change* consider that a failure to fully understand the concept of a system, or of what might be required to change it, lies at the heart of this problem:

> *"Although system change efforts in the human services or community change fields have become increasingly popular, this popularity has significantly outpaced their proven success… Limitations embedded in the conceptual frameworks used to understand, design and assess systems change efforts have not fully attended to the dynamics and properties of the contexts they are attempting to shift"* (Foster-Fishman et al, 2007, p198)

The paper therefore takes some care and time to explore the foundational constructs and extract what seem to be the important implications for systems change in practice, before moving into the more practical realm of identifying key principles or common characteristics of successful systems change efforts according to the literature. It also offers some examples as illustrations of systems change efforts at work, and summarises in the conclusions the key messages from the review for those who are interested in engaging in systems change efforts.

Section 2 Definitions and key concepts

2.1 Systems

The term system is used in diverse ways. It can describe various collections of entities; physical or digital structures (e.g. the underground 'tube' system in London, or the worldwide web); biological systems (e.g a forest, an ecosystem); and systems made up of or

created by people, including families, communities, organisations, agencies, institutions, and codifications (e.g statutes, the law). Thus for example, an ambulance crew, a medical team, the practices used to treat a particular condition, a 'care pathway' process, a medical department, a hospital and indeed the entire National Health Service may all be described as 'a system' depending on the context. We also speak of value systems, systems of thought and belief, systems of behaviour, family systems, social systems, engineered systems, mechanical systems, eco-systems… the list is endless, and not clarifying.

At a basic and technical level, a **system** is usually defined as an **interconnected and interdependent set of entities, where decisions or action in one entity are consequential to other neighbouring entities** (e.g Welbourn et al, 2012). Systems are thus defined by the interactions that occur within them; (Berryman, 1981). Interactions are the whole essence:

> *"A system is a group of interacting, interrelated and interdependent components that form a …. unified whole. A system's overall purpose or goal is achieved **through** the actions and interactions of its components"* (Coffman, 2007, 3 , my emphasis)

Another similar definition is offered by Foster-Fishman and colleagues (2007):

> *"A system is the set of actors, activities and settings that are directly or indirectly perceived to have influence in or be affected by a given problem situation"*

Systems of all sorts consist of 'stocks' and 'flows' (Meadows, 2008). Stocks are the assets or resources contained within the system (these might be material and non-material, depending on the system in question), and flows increase or decrease those stocks (inflows increase stocks, and outflows decrease them). 'Balancing loops' (see below) in physical and natural systems keep the system in equilibrium relative to its specific purpose.

Although the different components of a system may have specific functions, a system itself is not a functional hierarchy, with functions and interactions between the components fixed immutably. A human-designed or human-created system must, however, by definition have a purpose or a goal. W. Edwards Deming (1900- 1993), a key systems thinker with strong

influence on industry and management in the United States for much of the 20th Century also believed it must create something 'of value' to someone:

> *"A system must have an aim. Without an aim, there is no system...A system must create something of value. In other words results"* (Deming,1994, p50-51)

Of course, the purpose (or purposes) might not be immediately apparent, and might be viewed quite differently by different observers. The intrinsic or explicit 'value' might also be disputed.

In the physical sciences, *closed (or isolated) systems* are defined standardly as systems that do not exchange matter with their surroundings, nor are they typically subject to any force whose source is external to the system itself. A well-designed and properly insulated domestic hot water system would be an example. In the natural or human world however, where systems consist of or include living agents, systems are more usually described as *open* (see below, Properties of Systems) with fluid boundaries and exchanges of influence occurring across those boundaries. External forces may be substantially influential (think, for example, of the effect of climate instability on populations of biological organisms). This feature is critical to our understanding of human created systems and the natural systems they may in turn be dependent upon.

Systems thus may be of varying size and scale, and behave with varying levels of complexity and interdependency. Organised human systems are above all *multi-level* and nested phenomena (Gersick, 1991), and they always consist of two elements: the collective (social or organisational) and the individual. Although we often talk of systems as if they were 'things' that can be rationally 'engineered', this latter point has important implications. Human service systems consist not just of organisations and agencies but of individuals, who have autonomous choice and can take spontaneous actions even though they may be interdependent. To the extent that they do this, they cannot be thought of as (only) parts of a system or as resources within it (Stacey, 2006, p28). Stacey and Seddon (2008), both writing about public sector service systems and their governance in the UK, note that recent trends including the procedures of target-setting and monitoring*, "reflect a particularly simple form of systems thinking"* (Stacey, 2006, p31) of a dangerously naïve variety that fails to see the limitations of uncritical application of principles drawn from the study of systems

as rationally controlled, highly-engineered entities. Cybernetics (the study of self-regulating systems of control and feedback in machines and animals), in particular, has been extremely influential but "*it is a theory of control, and in importing into the social sciences we have imported the engineer's idea of control and have applied it directly to human action without carefully paying attention to the fact that human beings are conscious and self-conscious agents with some degree of choice and spontaneity*" (Stacey, 2006, p29). The extent to which these attributes of personal choice and individual spontaneity create significant – even unresolvable - challenges for those intervening in systems will become clear as this paper progresses.

2.2 Complex and complex adaptive systems

2.2.1 Complex systems

A **complex system**, widely considered a key descriptor of human systems as well as natural systems, is a term used to define a situation in which, in addition to the above, "*even knowing everything about that system is not sufficient to predict what will happen*" (Welbourn et al, 2012). A complex system is therefore a particular kind of system – one that is defined not just by its components and interactions but by its properties of 'emergence' (about which more later) and therefore, its **unpredictability**. Each such system has its own peculiarities, and, it has been wisely said by the great systems thinker Donella Meadows that "*it's dangerous to generalise about them*" (Meadows, 1999, 3).

Many systems that might not appear particularly complex on the surface turn out to be so, once carefully examined (Mowles, 2014). Some writers therefore claim that <u>all</u> social and human welfare interventions in fact turn out to be complex under the surface, rather than merely complicated[1], partly because they are always being inserted into a system, which is itself likely to be complex and partly because they are usually a response to a situation that is in Ackoff's terms, a 'mess', rather than just a more straightforward difficulty (Ackoff, 1974; Reynolds and Holwell, 2010, 4; see Box 1).

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[1] There is a very accessible discussion of the differences between complicated and complex at https://en.wikipedia.org/wiki/Cynefin_framework

In some senses then, all change initiatives in the social world are complex. No intervention exists in a vacuum; all are taking place or being inserted into a complex web that is the surrounding context. Thus, to a greater or lesser degree, some implementation specialists claim that **all** change or improvement initiatives need to be analysed as complex-systemic, whether or not they are explicitly recognised as such (Ghate, 2015).

Box 1

Characteristics of a 'mess'

- difficult to define and difficult to conceptualise clearly
- has serious implications
- involves people
- has many interlocking aspects
- occurs in different guises
- appears differently to different observers
- embodies high levels of uncertainty (about components, causes and solutions)
- does not have a clear answer or solution
- has aspects beyond anybody's direct control
- calls priorities and assumption into question

2.2.2 Complex adaptive (or responsive) systems

An **adaptive system (or a complex adaptive system, CAS)** , so-called, is one that is 'self-organising': that is, it **learns from experience** and can change itself in response to that learning, a process we call evolution in biological systems and technical advance or social change or revolution in human systems (Meadows, 1999). Self-organisation is described as the most powerful component of system-resilience, enabling a system to "*survive almost any change, by changing itself*" (Meadows, 1999). A complex adaptive system consists of very large numbers of interacting entities known as agents. As they interact, the agents adapt to one another, and form a system that is itself adaptive to its environment or context. The theory and terminology of CAS has proven very attractive to students of human systems, such that most writing in this field now refers to the principles of complex adaptive systems as underpinning any kind of implementation, and certainly any systems intervention. In particular, the models used for what are known as 'Step 2' CAS computer simulations (for

example, computer simulations of birds flocking) have shown, intriguingly, that the 'self-organising' and iterated behaviours of individual agents (in this case, birds in a flock) demonstrates an overall global pattern despite there being no global design, plan or programme. These patterns are both predictable and unpredictable at the same time, and they are able to produce novel as well as established results (Stacey, 2006). Even more attractive, the models illuminate sets of rules that govern the behaviours of the agents individually and collectively (sometimes described as 'simple rules' or minimal specifications, as in computer sciences).

The parallels these observations suggest for human systems and especially for human innovation efforts within complex systems seem helpful in understanding some of the challenges faced by real-world implementation and open the way to hope that change can be managed in some meaningful way. Yet despite the now common currency of CAS terminology in much writing on change and innovation in health and other public services, some critiques (e.g Stacey, 2001; Mowles 2014) point out limitations and oversimplifications in the application of CAS concepts to human systems. In particular, they note that the behaviours being modelled have limited relevance to typical human activities. For example, Mowles (2014) comments that in the examples of the birds' flocking behaviour, the pattern of emergence simulated never evolves beyond flocking itself. Only when the models move to 'Step 3' (which includes very diverse, non-average and non-linear interactions) do the patterns start to take on a life of their own, more similar to what we see in complex human systems, and at this point, predictions and rules become much harder to apply. As Stacey notes,

> "*it is highly simplistic to think of humans as simple rule-following beings… the essential and distinctive characteristic of human agents is that they are living bodies that are conscious and self-conscious, capable of spontaneity, imagination, fantasy and creative action. (They are) essentially reflexive and reflective… they are social beings in a distinctive way who …exercise at least some degree of choice as to how they will respond to the actions of others, and this involves the use of some form of evaluative criteria*" (Stacey, 2006, p33)

Stacey and colleagues therefore prefer to reframe the concept of the 'contingency based' CAS model and to think in terms of what they call '**complex responsive processes'** as more helpful for understanding systems in the social sphere. The word 'responsive' rather than adaptive used here places more emphasis on individualised human agency and less on systemic evolutionary mechanisms, and hence is felt to be more representative of the actual complexity found in human systems.

Nevertheless, whether we go all the way with Stacey's critique or not, as Eoyang (2011) notes: "*in spite of the concern about possible misapplication of metaphors from complexity science, the language has proven useful to respond to a variety of concerns*" (p323). The language and metaphors prompted by a consideration of complexity science continue to be used by many writers on systems change in human service or welfare contexts.

2.3   Systems thinking

'Systems thinking', arguably, is the foundation for effective systems change. Although there are different ways of describing the core elements of systems thinking, overall this means taking "***a systemic perspective in thinking about the targeted issue and the change process***" (Foster-Fishman et al, 2007 This in turn means being clear about how one thinks of and defines the properties of systems, where 'properties' means the underlying structures, features and principles that guide system behaviour. Foster-Fishman and colleagues (2007) for example claim that the failure of many systems change initiatives can be traced back to flawed thinking about the nature and form of the system in question. They note that the 'mental models'- defined by Senge (2006, p8) as "*deeply engrained assumptions, generalizations or even pictures or images that influence how we understand the world or how we take action*" – that are held by policy-makers and intervention designers frequently do not reflect the reality of complex adaptive systems. Instead they view the relationship between intervention and outcome as much simpler than it really is: as linear, predictable, and uni-directional, and as if social systems were like mechanical structures, with switches and levers to control them (Boulton et al, 2015). Systems thinking by contrast emphasises the unpredictability of systems (and therefore of system-change attempts), and the non-sequential and reflexive nature of action and consequence. It reflects an understanding that the interrelationship between the parts, and their relationship in turn to a functioning

whole, are the defining characteristics of a complex system. Recall again that systems are defined by the interactions between their constituent parts, not by the constituent parts themselves (Foster-Fishman 2007, 208; Vexler, 2017). 'Systems thinking' shifts the focus to the connections and interactions in a system, rather than the components alone. It also can help us find clarity in the 'mess' that typifies real-world systems:

> *"Systems thinking provides ways of selectively handling the detail that may complicate our thinking… in order to reveal the underlying features of a situation from a set of explicit perspectives"* (Reynolds and Holwell, 2010, p5)

2.4   Systems change

And finally in this section on definitions, what do we mean by 'systems change'? In the study of human service systems, systems change has been defined as ***"an intentional process designed to alter the status quo by shifting and realigning the form and function of a targeted system"*** (Foster-Fishman et al, 2007). Note that this definition is value-free (you could be engaged in systems change for all kinds of reasons, benign or otherwise), but in the social world, this generally means a concerted attempt to change the underlying structures and supporting mechanisms that operate within a system, such as the policies, routines, relationships, resources, power structures and values that shape it (Foster-Fishman et al, 2007, p197; Gopal and Kania, 2015) for the purposes of improvement or the alleviation of distress. It can mean attempts to dismantle a system (such as the systems that allow a social ill to persist - slavery and forced labour, for example; Vexler, 2017); or attempts to intervene in and buttress or 'fine-tune' an existing system to improve its operation in particular ways, for example by adding a connecting part that fills a critical gap. Walker (2017) therefore emphasises collaborative and brokering elements as part of the definition of systems change for philanthropic organisations: *"identifying the organisations and individuals already working on a problem, and helping them join forces to achieve their common goals"*. Less frequently, it can also imply the building of whole new systems to achieve new goals or purposes (Coffman, 2007). In recent times, the creation of digital information systems such as the internet is an example of this.

Analysts distinguish between types of system change in terms of periodicity (*episodic* or *continuous*) and degree (*incremental*, or *radical/transformational*). Episodic change describes the kind of change efforts most often made programmatically or on a project-by-project basis by government and philanthropic organisations. This tends to be intentional and planned (rather than emergent or fortuitous), driven externally, and time-bounded (Foster-Fishman et al, 2007). Many intervention 'projects' aim at episodic change.

Continuous systems change on the other hand describes the kind of change that occurs as a result of shifting social needs or mores, and may happen without any external master-plan driving it and as a result of many un-orchestrated influences and actors. This kind of change is also more likely to be incremental or *first-order* (for example, doing the same things iteratively but better, such as improving a curriculum in school over time), whereas *radical* or *transformational* change, by definition episodic, is often the espoused goal of governments or organisations with social or political goals and is usually a form of second-order change – a decisive break, or major or fundamental shift (a 'paradigm' shift; for example, the deliberate re-distribution of resources between advantaged and low-achieving schools; Foster-Fishman et al, 2007, 201).

Gersick (1991), beautifully combining insights across multiple disciplines including the social sciences, physical sciences, biological evolution and natural history, organisational management and adult human development explores a model of 'punctuated equilibrium' for systems change. Punctuated equilibrium describes the process whereby systems may exist in a state of relatively stable equilibrium, interrupted from time to time by revolutionary change. 'Equilibrium' here does not mean absolute stasis: even systems in equilibrium are in fact constantly shifting, undergoing or initiating constant minor adaptations in response to internal and external changes whilst preserving their essential 'deep structure' (a term she borrows from Chomksy's work in linguistics; see below). However, when deep structure is disrupted by crisis, by massive external environment changes or simply by the natural process of outgrowing old ways and the thirst for a new way to do things, then the way is open for revolutionary change. According to Gersick, the difference between the incremental changes of equilibrium periods and revolutionary changes *"is like the difference between changing the game of basketball by moving the hoops higher and changing it by taking the hoops away"* (Gersick, 1991, p19). Perhaps

counter-intuitively, however, she also notes that work in the physical and natural sciences has showed that revolutionary change, once initiated, does however have to be gradually dispersed throughout a system in order to have its full effect; history suggests no single change, however dramatic, is likely to convert a whole system instantaneously. Revolutionary change also has to take root firmly before being widely spread or it may eventually be diluted or destroyed by the parent population (the example here is the differentiation of new species in the natural world, where mutations may be destroyed before they can breed) or by the strength of the existing system, a phenomena sometimes described as otherwise known as 'system inertia' (see below) when traditional ways of doing things gradually re-assert themselves after what seems like massive change, albeit in some slightly modified form.

Systems change is probably one of the most challenging forms of social innovation we can attempt, not least because it is usually focused is on the 'wicked' problems of our time (a term coined to describe the most intractable, multi-dimensional, and shape-shifting problems that exist, Rittel and Webber, 1973). Just as each complex system is peculiar in its own way, so Walker (2017), and Green, (2016) similarly note that each complex systems change venture is different and efforts must be tailored to the specific setting, context, goals, resources and so on.

Systems change almost always involves a series of 'adaptive challenges' (Heifetz et al, 2009) rather than technical ones[2], requiring great agility and flexibility on the part of those who engage with it. Also, it is usually undertaken with the expressed goal of long-term sustainability: the fundamental point being to achieve lasting rather than ephemeral change. Many social initiatives are badged as 'system change', not least because funders have begun demanding this (e.g Linkins and Brya, n.d), although relatively few initiatives in fact meet the criteria set out in Box 4 (Common features of an effective 'system change' initiative, see Section 5). The idea of system change is particularly attractive to social and human welfare improvement organisations and funders because it holds the promise of sustainable change with far-reaching consequences, as opposed to the more contained and

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[2] Adaptive challenges are those where the causes of the problem are disputed, and the solutions are unclear. Technical ones are those where there is a high degree of agreement about the causes and the solutions of a problem.

constrained efforts that exemplify a typical single-intervention approach. There appears, in other words, to be more 'bang for the buck'. The idea of system change is also that its magic lies in in its potential for prevention of the problem in the first place – if the system surrounding and influencing a social problem can be altered, the root causes of the problem will also be affected in ways that can amplify the effects of the intervention and perhaps even ultimately dispense with the need for it altogether. So for example a domestic violence project that not only works with victims, but also works at the level of perpetrator attitudes and behaviours begins to address the deep issues that contribute to the violence in the first place.

Finally, the process itself may *be* the system change. Forming new relationships, making new connections, understanding new perspectives, shifting mind-sets, and 'reframing' problems can in themselves be transformational. Processes such as these do not, however lend themselves to standard measurement techniques in the manner of the kind of psycho-social or health outcomes we often expect from social programmes.

Section 3 Properties of systems

3.1 'Post Newtonian' Views of Systems

Contemporary thinking about human and social systems and about change within systems and organisations has been heavily influenced by the physical and biological sciences. Eoyang describes how a worldview grounded in the traditional Newtonian view of change emphasised features of the physical world: time, mass and distance. So terms have been handed down like *inertia* (that organisations will not change unless acted on by and external force), *resistance* by individuals and organisations, *progress* (a pre-determined point towards which organisations should move), *momentum* (smooth and predictable paths of change), *power* (to move a passive object), *perturbation* (disturbance caused by an external force) and a*lignment* (homogenous commitment to a single goal; fit between structures). Assumptions underpinning this view of systems were that boundaries were relatively closed, relevant factors could be identified and enumerated, and linear causality could be

hypothesised. But as the pace of global and social development accelerated towards the end of the twentieth century, the idea of complexity – even chaos – in systems began to seem more appropriate to describe the dynamics we encounter as we try to create social change. Studies of the biological and natural world gave us the metaphor of an *ecosystem* for innovation (Bason, 2010), concepts like *adaptation* and *evolution*, the concept of the *disturbance or disruption* (positive and negative; Christiansen et al, 2009) and the *beneficial toxicity* of innovation as a stimulus to adaptive mechanisms (Welbourn et al, 2012). Gradually a 'post-Newtonian', non-linear science of complexity has built upon and in some respects replaced the simpler and earlier constructs, offering more useful approximations to the modern world. We now know that systems are not 'things', and certainly not linear, and that levers of change (so-called) are not like levers in a mechanical system. Mowles et al (2008) for example are very critical of the way some international NGOs represent and try to manage change as if it were simply 'a matter of doing the right thing at the right time', which they find simplistic, authoritarian and hubristic.

3.2 Physical and Relational Elements of Systems

Notwithstanding that it has been noted that 'systems are ultimately …*constructs* used for engaging with and improving situations of real-world complexity' (Reynolds and Holwell, 2010, 7, my emphasis), rather than 'things', systems now are commonly understood to have physical realities and properties, as well as subjective and relational aspects. Thus, organisations in a system of care do exist as real entities, and interface in particular ways because they are designed or required to do so. But how the parts interact, where the boundaries are drawn between one component and another and how the system operates is also affected by the subjective perceptions of the individuals within the system, and very importantly by their relationships to and with one another and power the hold (or believe they hold) within that system. There is therefore a 'visible infrastructure', and an 'invisible infrastructure' (Metz and Albers, 2014), both of which are simultaneously real but also subjectively constructed, and therefore to some extent fluid.

This idea overlaps but is not identical to the concept of *apparen*t vs *deep* structures in systems (Foster-Fishman et al, 2007; Gersick 1991), which is an important foundational concept for understanding both systems and systems change. The *deep structures* are the

parts of the system that maintain and constrain existing system patterns (Olson and Eoyang, 2001) - the basic parts and basic activities. They are highly stable, the 'below the surface' element that includes normative influences - attitudes, values, beliefs, expectations and assumptions that drive behaviours (Foster-Fishman et al, 2007). It is probably also true that

relationships between individual agents in a system also often lie at this deep level, and may explain why transformational change often requires either conflict resolution activities, or even the removal of key individuals (or groups of individuals) in key organisations or positions and/or the introduction of new leadership as a 'new broom' to clear the way for change (Gersick, 1991). Many writers stress the importance of conflict and 'turf' fights that go on inside systems (Green, 2016, Foster-Fishman et al, 2007), some of which are visible, but some of which are not. Deep structure elements often lie at the root causes of system problems and altering them is claimed to be the only route to transformative, second-order change; in other words, transformative change cannot happen *unless* deep structure is altered (Gersick, 1991). *Apparent structures* on the other hand are the things we can readily discern and therefore most often focus on when we try to institute change. Elements that are often included here are available resources and capacity, regulatory processes (policies, procedures, roles, responsibilities), governance structures, and operational management arrangements. Most people who have been involved in (or defeated by) systems change projects will be aware that one can expend much energy and resource into changing these apparent structures, but still not see the more profound shifts that were the intended goal of intervention.

3.4 Systems Boundaries

Complex systems contain sub-systems ('systems within systems') catering to parts of a population, and at the same time are themselves part of a larger system. On this basis, some authors question whether the idea of a 'whole' (ie 'boundaried') system is in fact a useful construct at all for describing and working within complex social worlds (Mowles et al, 2008). But for most analysts, defining system boundaries (or at least, deciding where to draw them) is critical for systems definition and mapping (Midgley and Pinzon, 2011), and is considered by many systems analysts as the most critical and defining process in any systems change intervention (Midgley, 2000). In a sense, this could be seen as a necessary

process for achieving intellectual mastery over the complexity and intangibility of the task. But delineating boundaries is also a subjective and essentially arbitrary process (Midgely, 2000). They may shift over time and with successive iterations, and are subject to some degree of 'imagination' (Mowles et al, 2008). The lines we draw have specific values attached to them, and these may be explicit or implicit. Where boundaries are drawn is affected by custom and norms, values, politics, ideas about territories and 'turf' (Foster-Fishman et al, 2007), considerations of personal and collective power, and many other factors. Boundary judgements are particularly shaped by the mental models - the cognitive frameworks we use to conceptualise and act on a given task, based on knowledge and assumptions about how the world works (Senge, 1990, 2006) - or 'worldviews' (Churchman, 1968; Checkland, 2010) held by different stakeholders. Forming judgements about where to delineate boundaries between parts of a system, or between one system and another may be difficult, especially when mental models are hidden or tacit (as they often are). It needs to be *"a negotiated process among critical system stakeholders"* (Foster-Fishman, 2007, 203).

Human service systems also have boundaries that tend to be described as *open* (they are flexible and permeable, and as well as interacting with one another they are affected by the external environment); and are often *loosely coupled* (they are autonomous and self-directed, and their actions may *seem* to have little or no visible consequence for other parts of the system; Coffman, 2007). In this property lies another danger for the would-be intervenor – we often assume that taking action in one part of system may be accomplished with relative impunity as regards other connected entities. We are usually wrong: not anticipating perverse consequences by failing to see systems inter-connections is a common failure of systems interventions, discussed in more detail below.

3.5 Feedback, and Time Delays in Feedback

One approach to the study of systems known as System Dynamics (first developed by Forrester, 1968) has illuminated two important properties of systems knowns as feedback loops and time delays. These affect system behaviour in a non-linear way. The effect of *delay* in a system is described by Morecroft (2010), who following many authors uses the domestically familiar example of a slow-to-respond hot water system in which a person

attempting to take a shower is either drenched in cold water or in hot water, out of synch with the speed at which they turn the taps, because the effect of adjusting the temperature via the taps is somewhat delayed. The faster one turns the taps, the more the water temperature variations. Meadows noted that the *length* of the delay in a system (neither too fast, nor to slow) is the critical factor: feedback that is too instantaneous causes '*overreaction and oscillations amplified by the jumpiness of the response*'; delays that are too long cause '*damped, sustained or exploding oscillations…and at the extreme… chaos*' (Meadows, 1999, 8). It can be readily imagined in either a commercial or in a social or economic setting that managing the delay between demand and supply is one of the most difficult but critical aspects of effective systems design and management, and often one of the clearest targets for systems intervention.

The feedback (the information being conveyed back to the system) not only has to be timed effectively for a system to work well, but there is balancing effect to be achieved, created by an optimal interplay of *negative* and *positive* feedback. The terms 'positive' and 'negative' as used here are used to indicate desirability: both are needed for good system health. By 'negative feedback loop' is meant the kind of feedback that is ubiquitous in nature, whereby information conveyed back to the system when there is a disturbance to ideal conditions and triggers an 'emergency' response designed to restore equilibrium: for example the sweat/shiver mechanism of mammals that is designed to maintain core body temperature. These are self-correcting and vital for system health. By 'positive feedback loop' is meant the kind of feedback that is self-reinforcing and gains power from its own operation: for example, the spread of infection; population growth; money in the bank earning interest; the production of fat cells in the body generating hunger, triggered by overeating. Senge (1990) terms these balancing and re-enforcing loops 'vicious' and 'virtuous cycles'. Balancing loops that keep both types of feedback in check are commonly found in nature and in human systems as well as in engineered ones (Meadows, 1999, 2008; Morecroft, 2010), but some work better than others, and some work in such volatile contexts that it is almost impossible for equilibrium to be reached for long.

3.6 Emergence and Synergy

Because the interactions within a system are what defines it, and because in a living system (or one in which living things are agents within it) those interactions occur inside and across boundaries including those external to the system itself, the properties of emergence, synergy, and unpredictability are much emphasised within the systems literature (Green, 2016; Foster-Fishman et al, 2007, Mowles, 2014, Senge, 2006 and many others). Even the most comprehensive and meticulous mapping and planning cannot remove the element of unpredictability that is fundamental to complex responsive systems. *Emergence,* a term which has the double dictionary definition of the *process of coming into existence*, and the *process of becoming visible after being concealed*, is aptly used in systems thinking to describe the way in which 'things happen' or 'things are revealed' as a result of systems interactions and systems interventions. Emergence can be a positive and enabling force – the goal, perhaps, of a whole process of change - or it can be a challenge or a force for disorder, threatening to destabilise the smooth process of change that is sought. *Synergy* is also held to be a property of complex systems (and sometimes the goal of systems interventions), meaning a state in which the interactions between the parts of a system produce combined effects that are greater than their individual effects (ie, the whole is greater than the sum of the parts). As with emergence, achieving 'synergistic' benefit may be the active goal of a systems intervention, where change agents may seek to put or force previously unconnected individuals or agencies into joint co-operation in the expectation that this will produce additional value for the system.

3.7 Perverse Consequences

The whole essence of a complex adaptive system is its propensity to generate emergent behaviours and hence to be unpredictable and 'counterintuitive' (Meadows, 1999). Because of this and other dynamic properties of systems listed above (including time delays in feedback, and the operation of balancing loops), one facet of complex systems is the high risk of perverse consequences when systems interventions are made. Meadows (1999) cautions: "*Leverage points* (for system change intervention) *are not intuitive, or if they are, we intuitively use them backward, systematically worsening whatever problems we are trying to solve*". She cites the example of Jay Forrester, an early pioneer and seminal thinker

in systems analysis based at MIT in the USA from 1950 onwards, who cautioned (against the grain of other contemporary policy thinking) against the massive growth in subsidised urban housing projects for the poor. Forrester's computer simulation work in urban dynamics had showed that the *less* subsidised housing a city had, the better off the city was – even for those on low incomes. He speculated that massive growth in this sector without corresponding job creation and attention to other factors that are significant for human welfare beyond simply having a roof over one's head would, in particular, disrupt a city's employment-to-housing ratio. It would certainly attract new residents to the cheap housing, but without jobs and legitimate means of raising income and maintaining a decent standard of living. He predicted it would add to and concentrate rather than alleviate human misery and its costs to the public purse. He was correct; and after decades of building, the decaying and crime-ridden housing development 'projects' in many US cities began to be removed. Numerous other examples can be found in the literature of the perverse unintended consequences of well-intentioned intervention in systems; for example, closer to home in the UK, in the NHS, a performance improvement initiative in 2001 to fund ambulance services most in need of improving, most of which were identified as being outside London. The London Ambulance Service suffered collateral costs of £1.5m as other areas recruited good staff away from London, with costs to the London service of £20,000 per head to re-recruit and train replacement staff (Abercrombie et al, 2015).

Other types of perverse consequences can also arise from human agents actively 'gaming the system'. For example improvement targets set as part of systems improvement efforts to which pay or other benefits or sanctions are attached often lend themselves to this. Seddon (2008) cites the case of Building Development Control (aka Planning) departments in local authorities in the UK. The setting of target times for resolving applications can lead to 'churning', where more complex applications that cannot easily be resolved at first pass can lead to up to 40% of applications being returned to the system, packaged variously as Refusals, Requested Withdrawals and Consent-with-Conditions: "*all ruses* (by staff) *to enable the achievement of the (8 week) target*" (Seddon, 2008, p83).

3.8 Inertia and 'Resistance to Change' in Systems

A property known as 'systems inertia' is noted by many writers on systems change. Green (2016), summarises barriers to change in terms of institutions, ideas and interests; Gersick (1991) also draws attention to three factors: cognition, motivation and obligation.

Although Greenhalgh et al, (2014), Cassam (2017) and Ghate (2017) sound an important note of caution that sometimes change is resisted by individuals for warranted reasons (e.g, the change in question is a bad one, or is feared; Heifetz et al (2009), the tendency for systems themselves to resist change is well-noted by would-be innovators (Ghate, 2015). Writing from the perspective of implementation science, Fixsen et al (2005) quote an experienced philanthropist who notes: *'systems trump programs',* describing the way that even the best-resourced and most promising projects will fail or be marginalised if inserted into an unready, unreceptive or unwelcoming system. Green (2016, 41) cites 'institutional blockages' including management systems, corporate culture and bureaucratic processes as fundamental brakes on the speed if not the actuality of systems change. In her analysis of the way in which systems experience punctuated equilibrium over time, Gersick (1991) explores the various ways in which systems may actively or passively resist change. One explanation for the (relative) stability of equilibrium periods is that the system itself benefits from equilibrium. The calm of equilibrium favours human productivity – the ability to pursue goals and accomplish work. Watson (1989), cited in Bason, 2010) thought that the fundamental role of organisations was in any case to reduce uncertainty and introduce stability of routine. For constituent parts (such as organisations or teams in human systems), equilibrium allows for the development of specialisation in operations, fine-tuning of adaptation to the environment or niche, and for the acquisition of deeper and better skill and confidence. For individuals, it is emotionally less demanding and uncomfortable than change (Macdonald, 2002; Rushmer and Davies, 2004). There may also be vested interests, sunk costs (effort already expended in establishing the existing order), and valued relationships at stake. There are also cognitive aspects: Green (2016) notes that communities and groups may be wedded to particular ideas that support the status quo (norms, values, and other 'ideas'); indeed many other writers note that cognitive frameworks and our ability to comprehend problems and their solutions often shape and limit the response to the need to change. Individuals' sense of obligation and commitment

to established structures and designated roles is also at play here, as are existing human relationships that have been formed, and a system may *"pervasively… may be bound by others' expectations and needs*' (Gersick, 2016, 18; think for example of the trauma often expressed by service workers when their service is cut or reorganised so that their normal work with users is perceived to be under threat).

Section 4 What do we mean by Systems Change in the social arena?

4.1 Arenas and Settings for Systems Change

Generally, the characteristics that distinguish genuine systems change attempts include focusing on one (or usually more) of the dimensions shown in the Figure 1 below, adapted from Julia Coffman's work on evaluation of systems change, though not necessarily all at the same time or in this order

Figure 1 Five dimensions of focus for systems initiatives (Adapted from Coffman, 2007)
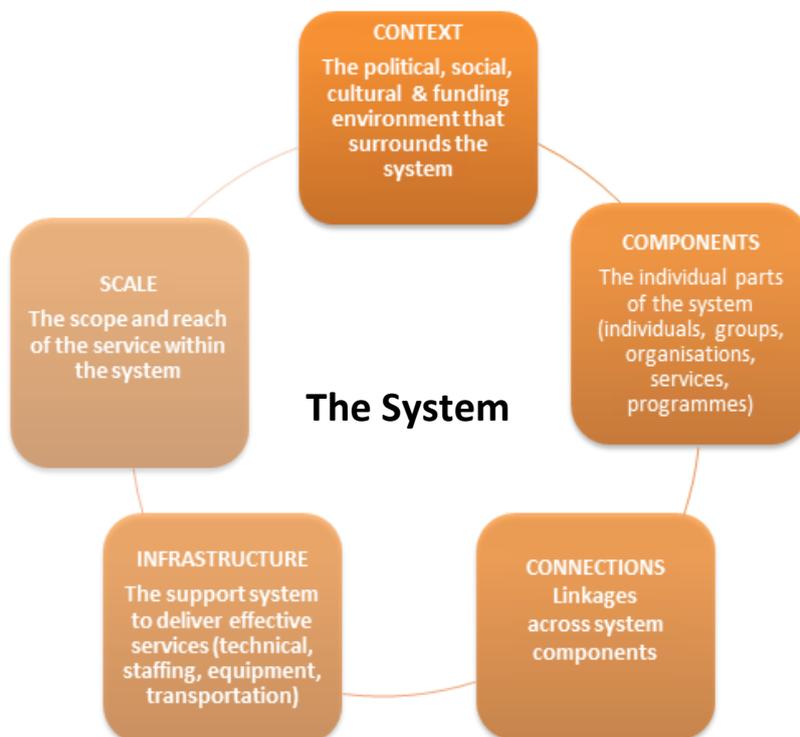
Systems change efforts can happen across all sectors and settings, but are typically active at *multiple levels,* for example, with work streams involving individuals, communities, organisations, and institutions. Many of the most compelling examples are targeted on the 'big' problems of the world, the seemingly intractable ones, especially in the public health, environmental and international development arenas. Social care systems change examples can be found most abundantly in education; less so in other services to people, although in parts of the UK, projects such as Total Place (a discontinued attempt to galvanise joint working across multiple sectors including health; see Lewis et al, 2013) and the ill-fated Troubled Families initiative (Crossley, 2015) in England also had systems change in their sights, albeit not explicitly badged as such.

4.2 Types and Forms of Systems Change

Systems change can take many different forms. As noted above, there is variation around periodicity and degree and many combine elements of both top down and bottom up approaches (top down, starting with leadership and the overt locus of power in the system; bottom-up, starting at grass-root levels, with on-the-ground beneficiaries and workers in a system). But since as we have noted systems are different to one another and all systems change interventions are 'custom' (Walker, 2017; Green, 2016), although there are some discernible common elements, much variation exists.

Systems change efforts may involve '**doing**' systems change - getting involved actively in one or more part of a system, for example by providing a new service or resource or helping existing providers to work more effectively. Examples include the Raspberry Pi project in the UK, a change initiative operated by the Raspberry Pi Foundation (https://www.raspberrypi.org/about/) which began in 2008 as an effort to increase the number of young people acquiring the interest and confidence to eventually become computer programmers by producing and distributing a low-cost, simple and programmable computer (the 'Raspberry Pi') to schools throughout the UK, and then supporting young users to develop skills in using it.

Other examples from the United States include systems change initiatives that provide assistance across a range of dimensions to help upskill practitioners, managers and

planners, for example, Smart Start, which began in North Carolina in 1993 . This has the underlying aim of strengthening the early childhood care and education system to improve school readiness across many states, but works toward that end at multiple levels including to support state's infrastructure (for example, sharing effective governance structures or working on creative ways to apply for and use federal funding), technical assistance to organisations to collect and use data more effectively, coaching for individuals, site visits, research, and convening; see http://www.smartstart.org/about-smart-start/.

Another example from the USA in child wellbeing and education blends research with delivering a new curriculum. *The Compassionate Schools Project* in (Walker, 2017; http://www.compassionschools.org/program/) which is a combination of a research programme and a 'whole child' systems change intervention planned over 6 years form 2014. As the description below suggests, taken for the project's own website, it appears to have many of the hallmarks of a well-planned systems change initiative, although results are yet to be delivered. It claims to be "*the most comprehensive study ever undertaken of a 21st century health and wellness curriculum in an elementary or secondary school setting. Facilitating the integrated development of mind and body, the project interweaves support in academic achievement, mental fitness, health, and compassionate character. The research aims to have a major impact on children's education nationwide in terms of academic performance, physical education, character development, and child health policies due to its extraordinary scale of 50 schools and 20,000 children over the project's seven years. Educating the whole child for self-awareness and self-understanding, the curriculum integrates mindfulness for stress management and self-control; contemplative movements, postures and breathing for physical awareness and agility; nutritional knowledge for healthy eating; and social and emotional skills for effective interpersonal relationships. Elementary school students will learn to cultivate focus, resilience, empathy, connection, and wellbeing as the basis for academic and personal success*". The synergistic design came about after various interventions pitched to the instigators for inclusion, but none met all the criteria for wellbeing that the programme designers wanted. A process of putting all the pieces together ensued, and as the programme is being rolled out other schools district, a customised blend is agreed that reflects local context and feasibility. The programme has yet to deliver results, but is receiving much attention in the USA.

However many systems change endeavours take place more at arm's length, and take the form less of doing and more of **'bridging' - brokering or facilitating and encouraging** others who are already in the space to engage in activities that lead to change, often with a focus on collaborative, boundary-spanning activities. This type of role might include lobbying and advocacy; convening; brokering new relationships and joint working arrangements; commissioning research and analysis to illuminate systems issues; setting up pooled funding schemes (Walker, 2017); and commissioning shared services. Walker (2017, 3) quotes a funder from a large private foundation in the United States describing how frustration at not having the scope of impact they sought led to a process of 'redefining' the philanthropy's role to become "*the curators or stewards of the ecosystem around an issue….the connective tissue between parts of the ecosystem*". In effect, they became *systems entrepreneurs* (see below). Focused '*more on solving problems through creative collaboration and less on the establishment and perpetuation of new institutions*'.

The Freedom Fund (Vexler, 2017; http://freedomfund.org/) based in London but working globally is one example where brokering and supporting is a major part of the model. A £17m global philanthropic initiative to end modern slavery, is often cited (according to one of its senior leaders) as a 'rare example of systems change in action'. Their mission is stated as "*to mobilise the knowledge, capital and will needed to end modern slavery*". Initially, three of the world's main funders of anti-slavery programmes combined investments to co-ordinate efforts and work at a larger scale than each could do alone. The Fund, which is a pooled funding initiative, brings together a large number of frontline civil society organisations in countries with high levels of slavery, and funds and trains these organisations to 'help them connect with government and business to drive through reforms'. They have an explicit goal to build long-term capacity, investing in existing front-line organisations not just time-limited 'project' funding. In their 2016 Annual Impact Report they cited 98 partners in six 'hotspots' across four countries. They measure their success not only in terms of 'traditional' outcomes measures, e.g numbers of people liberated from slavery, numbers of at risk people diverted into education or employment; but also in terms of 'systemic indicators' (number of coalitions built, numbers of grassroots organisations brought to the table, number and types of convenings facilitated, data systems and feedback processes established). The types of activities the Freedom Fund

Partners engage in are extremely various, responding to diverse local needs strengths and capacities as well as local cultures and norms, and range from high level top-down work with international governance to supporting bottom-up work with local communities and activists. See http://freedomfund.org/wp-content/uploads/FF_IMPACT10_WEB.pdf

A European example of brokering and supporting in the early intervention and prevention field is the *Early Intervention and Prevention Initiative* in Ireland (2004-2016), although this did also include the establishment of serval new organisations. https://www.atlanticphilanthropies.org/subtheme/prevention-early-intervention

The Atlantic Philanthropies first partnered with government and then co-funded the set-up and 10 year operation and evaluation of a small number of 'backbone' organisations each with an explicit systemic change mission, as well as supporting numerous smaller individual providers and one central implementation support centre. The backbone organisations sought to galvanise local systems change through co-creative and collaborative working in their local settings, and were in turn themselves part of a wider systems change goal that extended across the whole island of Ireland and worked closely with government. In total, the Atlantic Philanthropies, with Government and other organisations, invested in 52 prevention and early intervention services and programmes across the island of Ireland. Programmes aimed to improve outcomes for children and their parents, in areas of their lives such as child health, behaviour, parenting, inclusion and learning. See: https://www.atlanticphilanthropies.org/research-reports/report-ten-years-learning.

Section 5 Conclusions: Principles for, and characteristics of, successful systems change

5.1 Before one begins: describing and understanding 'the system' in question

The stand-out message from the widely interdisciplinary literature on systems change is that no-one should start this work without a clear understanding of the basic properties of systems, as described above in Section 3. Human systems are like – but not exactly like –

other systems (natural, mechanical) and the most sophisticated analyses are able to draw useful analogies with system properties in other dimensions of the natural or built world, but know where the similarities stop. It may be interesting, for example, to note that algorithms can be designed to predict the flocking behaviour of in a murmuration of starlings, demonstrating order out of what seems like chaos using simple rules, but this becomes less useful as an analogy for human systems and how we might control or influence them when one understands that the only purpose of the flocking behaviour is aggregation; nothing else 'happens' as a result of this behaviour.

In addition to understanding the properties of complex systems in general, another stand-out message for effective systems change is the significance of careful preparatory analysis of the *specific system* that is the target of intervention, so that as much as possible is known before work starts. Those who are working to change a system must first acquire "*a deep understanding of the system or systems they are trying to change and all the factors that shape it*" (Kirsch et al, 2016). In this it is important to try as far as possible to look at the whole, daunting though that may be. It is a basic tenet of systems science that one cannot understand a system by looking at just one part, and a system cannot be influenced if parts are left out of the effort (Foster-Fishman et al, 2007). This, it is expected, will:

- help delineate boundaries, giving a sense both of the scope of the task and who (or what) the task involves;
- illuminate connections, interdependencies, duplication, and 'turf' between the various stakeholders
- reveal the nested layers that form the structure of a complex system
- reveal the relationships (or lack of them) that pertain between stakeholders and give some insights into power hierarchies

Delineating system boundaries at the outset of a system-change initiative is considered particular essential by many as a prelude for constructive collaboration by actors in a complex system. It may be a time-consuming as we have noted, due to the subjective nature of that process, and will unavoidably be a contested process. It also important to remember that system boundaries may never be fixed, and how they are understood will vary depending on who is observing them and for what purpose.

There are in fact a multiplicity of tools for the purpose of systems description, mapping and analysis, including social network analysis (Gopal and Kania, 2015); and 'influencer maps' (Kirsch et al, 2016). Bason (2010) recommends the use of 'service journeys' to trace how people move through systems of care and other systems. Causal Loop Modelling (part of a methodology known as System Dynamics, Rich Picturing (part of Soft Systems Methodology; Checkland and Poulter, 2006); Boundary Critique and critical heuristics (Ulrich and Reynolds, 2010; Midgley, 2000; Midgley and Pinzon, 2011) are examples of well-developed methodologies arising out of somewhat different perspectives and schools of analysis that are amongst the most useful to systems practitioners[3]. Foster-Fishman et al (2007) also give some suggestions for how to undertake a system definition exercise by paying attention to *levels* (or layers), *niches, organisations* and *actors*.

There is of course always danger that some of the tools for formal systems description and mapping may overemphasise the apparent and physical structural properties of systems (for example which agencies are part of the whole system, which populations or groups do they serve, how are they regulated by policy and statue etc), and overlook the significance of deep structures and relationships between actors within the system. It is therefore important to watch carefully that the simplifications we necessarily apply to make the task more understandable and manageable are not over-simplifications that may, in the end, prove counterproductive.

5.2 Find a *systems entrepreneur*

Walker (2017) and Balfour (2017, writing about human trafficking interventions) use the term *systems entrepreneur* to describe the key individual(s) or teams who act as galvanising and supportive agents in the process of systems change. This role is critical to effective systems change, and distinguishes systems change from 'point' intervention management in much the same way that an adaptive challenge is distinguished from a technical one. Arguably, one cannot 'manage' systems change; one can only incite (and then support and encourage) it.

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[3] I am grateful to Professor Gerald Midgley for suggesting this particular list.

"A systems entrepreneur is a person or organisation that facilitates a change to an entire ecosystem by addressing and incorporating all of the components and actors required to move the needle on a particular social issue" (Balfour, 2017)

Such a person wears many hats and performs many different roles. Ultimately, their role is to 'create a climate in which there is shared understanding of the goals of systems change' and understanding of the significance of each party's role in producing those outcomes. They must have credibility (or at least acceptance in that role) across multiple stakeholder groups, be an excellent and proactive communicator, a networker and a broker, and able to act independently, flexibly and with tact, insight and diplomacy. Balfour likens them to "*a central gear… the catalytic force that creates momentum among all the other actors*". Other terms that capture this idea are in also use: '*systems incubators'* (groups doing systems change together); and '*change agent'* (Rogers, 1995; Foster-Fishman et al, 2007). At the heart of all of these terms are concepts of credibility and authenticity (the change agent has to be an 'honest broker' - with no hidden agendas or pretended expertise); freedom from vested interest; insight into varying motivations and priorities; and ability to move between settings and agendas with agility and skill, seeing the connections as well as the road blocks, and helping stakeholders to achieve respectful and effective collaboration. It is a role requiring huge skill and tact, as well as a maturity of perspective, determination and resilience.
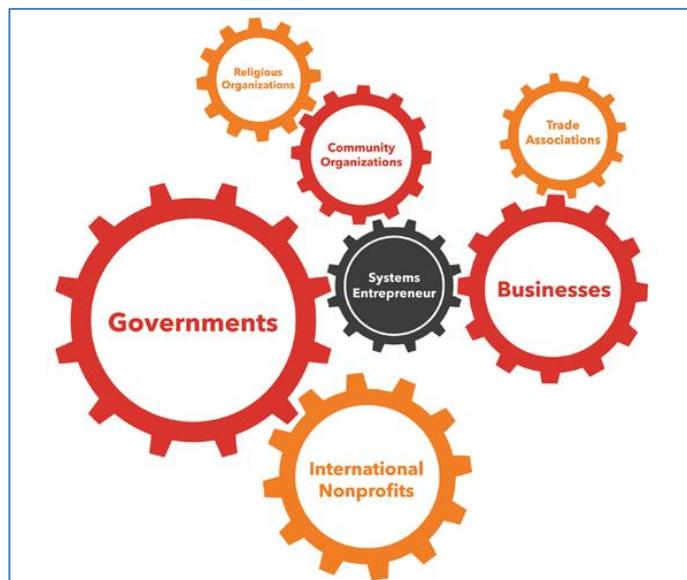
Figure 2 The systems entrepreneur as a central gear; (Balfour, 2017; Vexler, 2017)

5.3 Systems change is about shifting mind-set

Senge (1990, 2006) noted that mind-shifts almost always underpin successful change, and these generally happen when diverse actors are brought together in new ways. Hence

many systems change efforts include convenings for activities under the rubric of co-creation (see below) across boundaries of various sorts, paying careful attention to 'hearing all the voices' in the room. Sometimes the mind-set shift may itself be the system change agent (Foster-Fishman et al, 2007). For example, professionals in different sectors may make profound changes in practice once they recognise they share goals in common with others in different part of the system, and once they hear from those in the system they might otherwise have little exposure to (Ghate et al, 2013, 33; and Lewis et al, 2013). As Churchman, a key systems thinker writing fifty years ago noted "*systems change begins when you first see the world through the eyes of another*". (Churchman, 1968, quoted in Reynolds and Holwell, 2010, 8). Letting go of *dogmatism* and *reductionism* (Reynolds and Holwell, 2010, 6) and according to Meadows (1999), starting a process at least initially by being open to anything (she calls this '*not having a paradigm*') may be the most powerful of all levers in the systems change arena (and also possibly one of the most challenging).

At the level of individuals, this mind-set shift might take the form of 'unlearning' (Rushmer and Davies, 2004) a particular behaviour underpinned by beliefs or knowledge that has now been called into question (for example, public health nurses abandoning prior practice in advising parents to place newborns supine on their backs or sides to sleep, rather than prone on their stomachs; Macdonald, 2002). This is emotional and unsettling work for the individual (Macdonald, 2002; Kuhn, 1970; Levinson, 1978) and not something to be taken lightly by systems entrepreneurs.

5.4 Distributed and 'systemic' leadership

Most commentators agree that systems change requires purposeful leadership, but that this is leadership of a very specific kind. There is wide consensus that traditional forms of 'command and control' (also often called 'top down' leadership or 'leading from the front') is not effective for systems change work (Seddon, 2008; Stacey, 2006; Foster-Fishman 2007,

Ghate et al, 2013 and many others). Seddon provides a useful summary of command and control attributes; reproduced in Box 2.

Box 2 Command-and-control thinking; from Seddon (2008) p 48	
Dimensions	**Command-and-Control thinking**
Perspective	Top-down, hierarchy
Design	Functional specialisation
Decision-making	Separated from work
Measurement	Productivity output, targets, standards, related to budget
Attitude to customers	Contractual
Attitude to suppliers	Contractual
Role of Management	Manage people and budgets
Ethos	Control
Change	Reactive, projects
Motivation	Extrinsic

Systems change is too complex and too subtle to achieve simply by mandating it: ie, telling people, 'do it because we say so', (although we still often see examples of this in all arenas of public administration). Rather effective leadership for systems change for the public good has to expect, allow for and facilitate emergence. Thus, the some of the traditional qualities we have valued, culturally and politically, in leaders of the past, including forceful and unwavering single-minded focus, obstinacy and willingness to 'stand alone' may in fact be counter-productive when systems change is the goal. Since systems change work inevitably crosses many boundaries and typically involves multiple layers of culture, structure and operations, leadership of systems change work always needs to be *collective* (that is, involving many, not few), and *distributed* (that is, found and encouraged at various levels of organisation and community structure, not concentrated with those who have positional authority attached to specific office or role).

A recent study of system leadership in public services in Britain for the Staff College (Ghate et al, 2013), drawing on prior work on 'whole systems' change in the NHS by the Kings Fund (Welbourn et al, 2012), developed a framework for describing the attribute of effective cross-systems leadership in practice. In addition to drawing on the wider literature on leadership in complex systems, the framework was based on empirical case study data from the UK and four other countries, and interview data from those working in complex systems change leadership or support roles in the UK. It distilled six

> **Box 3   Six 'ways' for systems leadership: dimensions of effective leadership**
>
> 1. **Ways of feeling:** the moral compass and personal core values that leaders hold
> 2. **Ways of perceiving**: how leaders see, observe and hear the surrounding context and actors, seeing the big picture and paying close attention to diversity
> 3. **Ways of thinking:** the cognitions, curiosity, intellectual agility and clarity of analysis that leaders show - how think about and translate or make sense (for themselves and others) of the context for change
> 4. **Ways of relating:** how leaders form and sustain productive relationships with other stakeholders, with self-awareness, authenticity, empathy, and respect
> 5. **Ways of doing:** how leaders stimulate, enable and facilitate others, and their ability to share and cede power (and credit), as well as use resources creatively
> 6. **Ways of being:** the unifying personal qualities of effective systems leaders that embody some familiar characteristics of strong leaders (bravery, resilience, confidence, energy and drive) and some less familiar ones (humility, magnanimity, patience).
>
> From Ghate, Lewis and Welbourn (2013) *Systems Leadership: exceptional leadership for exceptional times* Nottingham: VSC

dimensions of effective systems leadership, summarised in Box 3.

These attributes are shown within an integrated model that shows how they sit at the centre of the surrounding systems context and its challenges, in Figure 3 below[4].

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[4] NOTE: In the Figure X, 'paradox' refers to the noted tendency of systems to be characterised by opposing forces and tensions that may not be reconcilable and must be 'lived with' (Ghate et al, 2013, p21)

Figure 3 Systems leadership in systemic context

Systems Leadership- an integrated model
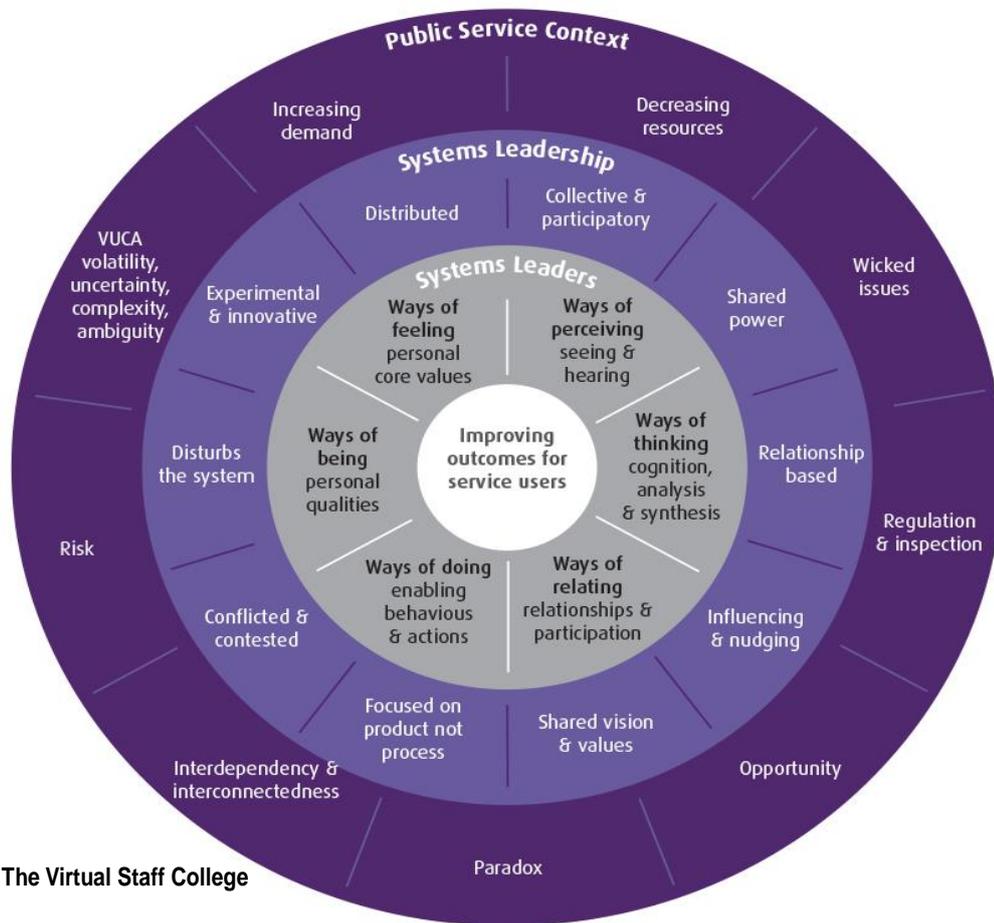
© 2013 The Virtual Staff College

26

5.5 Power analysis

Much of the literature on systems change emphasises the significance of power for how systems work and how they may be influenced, and the vital importance for systems change agents of making a careful power analysis (where power lies and who holds it) before starting work. "*How power is enacted within a system is both symbolic of and a manifestation of the status quo… attention to power creates an … opportunity to target root causes of problematic behaviour*" (Foster-Fishman et al, 2007). Green (2016) calls this a *Power and Systems Approach* (PSA) and holds this to be central to how change is achieved. He gives numerous example of how power is not always held in the obvious places, noting

"a power analysis should stimulate ideas for strategies for engaging with the main institutions [or individuals] *that drive or block change... It should also help ...understand how those allies and opponents perceive the change… and why change **doesn't** happen - the forces of inertia or paradigm maintenance "* (p243). Foster-Fishman and colleagues suggest

the focuses of power analysis should be *influences*: who and what influences how resources are distributed; how actions are carried out; how decisions are made; and how individuals and groups gain and leverage the power they hold. A power analysis for any given situation should be able to disaggregate and identify who or what holds 'power within' the system under scrutiny; where there may be 'power with' (power than can come from collective action); and 'power to' (who is able to do what within a team or organisation).

According to Green (2016), this may help move the focus to those who are often excluded from decision-making (those who are marginalised within the normative power structures) and whose empowerment often lies at the heart of long-term change. In Green's field (international development) empowerment of individual and communities often *is* the systems change goal itself, and so this approach clearly makes sense.

Seddon, by contrast, takes a cooler view of the concept of empowerment as a form of systems change in the work arena, which he sees as a preoccupation and a buzzword of command-and-control managers (whose own mind-set and behaviour to begin with is the disempowering force; if managers did not think and behave like this, in his view, 'empowerment' would not be necessary. Those doing the work would already have autonomy and investment in the work).

> *"When you change the system, putting people* [not processes] *in control...the motivation is intrinsic. …We should not think of this as 'empowerment'*… (It happens anyway) *when people are instrumental, along with their managers, in redesigning a system"* (Seddon, 2008, 77)

5.6 Watching the margins

Related to power issues is the principle of paying close attention to the margins – these being the elements that are placed outside the system boundaries by one group but included in the system by another. We noted (above) that the act of drawing boundaries

around a system is in itself a political and subjective act with implications for how we approach any systems change effort. But in addition to serving the important purpose of engaging multiple stakeholders to ensure a comprehensive mapping of perspectives, attention to elements that are marginalised can give important insight into system values and system conflicts (Foster-Fishman et al, 2007). These may include alternative and non-traditional settings, and individuals who are typically excluded from power and decision-making roles. The deliberate inclusion of and emphasis upon those marginalised elements within systems boundaries, perhaps contrary to established norms for representing that system, can significantly challenge dominant system values.

5.7 Identifying leverage points

Some authors are extremely critical of the use of analogies like 'levers' of system change on the ground they imply a simple relationship between cause and effect that does not hold true in complex social systems; (Mowles et al, 2008). This critique is important. Nevertheless, the concept of *leverage points* (points or places of intervention that may be more likely to bring about change in a system) is useful for structuring thinking about priorities and probabilities of success for systems intervention, provided we do not interpret the metaphor too literally. Donella Meadows's fine and inspiring paper for the Sustainability Institute (Meadows, 1999) draws out a series of twelve leverage points, presented in increasing order of effectiveness, from a wide literature on systems and how they work. She starts with points of leverage suggested by the properties of natural and human-engineered systems (e.g the existence of constants and parameters; flows that create the balancing forces of negative and positive feedback; feedback delays and how they interfere with re-equilibration) and moves in increasing order of effectiveness through the points of leverage presented by the properties of social and biological systems (rules and incentives, ability to evolve and self-organise, goals, mind-set and paradigms). For her, the most powerful leverage point of all is "*the power to transcend paradigms*" – in other words, the ability of human beings to discard dogmatism, retain an open mind and entertain the possibility that things may be other than how they seem. She also notes that the leverage points are not at all intuitive, which is why human interventions in systems so often create perverse consequences and make things worse.

5.8 Working 'with the grain': readiness and alignment

Although perhaps counter-intuitive (we often tend to think first of the radical or transformational types of systems change when we hear the term) many writers on systems change note that effective systems change work often works 'with the grain' rather than against it. The existing system is unlikely to be defective in all respects, and finding the places where people or agencies may be most receptive is a recommended strategy of several writers in this field. Gopal and Kania (2015) offer five principles for philanthropic foundations wishing to engage in effective systems change, one of which is to develop 'sensing mechanisms' to identify and surface existing trends, where energy and momentum already lie within the system. Without this, they suggest that foundations may either fail to amplify pre-existing developments that support their own aspirations; or they may inadvertently impede their own efforts by creating friction. Green (2016) describes how many successful development projects build on precedent: *"working with precedent rather than importing best practice from outside makes it more likely that whatever we do or suggest will be compatible with the local system"* (p242). Meadows (1999) notes that when change is leveraged within a system's norms and regulations (the 'rules' – laws, regulations, policies etc), change is more likely to happen because rules exert particularly strong influence on system behaviour. Hence, lobbying for policy makers' attention is a favoured tactic of would-be systems change agents. Of course, sometimes the precedent is the problem, but the principle of recognising existing strengths and playing to them is familiar in many fields of intervention as well as in the systems change arena. Nesta's 'Radical Efficiency' booklet (a set of recommendations distilled from case studies of cost-cutting service improvement projects, [NESTA, n.d.] notes that 'working with the grain' by which they mean placing emphasis on working with existing social relationships and building relationships between services staff and users) is a core principle of effectiveness. Implementation scientists place great emphasis on the concept of 'system readiness' (as well as individual and organisational readiness) and 'system alignment' as precursors to successful innovation and have developed tools to measure these attributes. This flags up for would-be innovators that ensuring that system components are likely to be receptive to change and finding the points of complementarity with existing processes ('business as

usual'; Ghate, 2015) is a sensible preparation that helps innovation and change to progress more smoothly.

5.9 Working with emergence, uncertainty, ambiguity, diversity and conflict

The properties of emergence and synergy create special challenges for effective systems change. Pawson and Tilley (1997), evaluation scientists, used the term *generative causality* to describe a type of emergence whereby global patterns arise as consequence of what locally-acting individuals are doing. However, this may be relatively contained in scope, and may not give much insight into the nature of those local interactions (Mowles, 2014). In the management literature, Heifetz et al (2009) use the memorable metaphor of 'getting on the balcony' above a dance floor as a way for organisational managers to see for themselves what emergent patterns are forming in their team or organisation, and what the 'big picture' looks like when they are managing in complex and fluid situations. As noted, emergence may be not just a property of systems but a goal of systems change, but Stacey (2001) argues that it is only when actors or agents in a system are extremely diverse, and interact in non-average and non-linear ways, that truly evolutionary and novel behaviour - meaningful, change-making emergence – begins (Mowles, 2014, p166). This type of emergence is therefore especially unpredictable and can create a degree of ambiguity around what, exactly, the relationships between actors in a system are, or are on their way to becoming (Ghate et al, 2013). The ability to work with ambiguity and to make it tolerable to those who are part of change processes is therefore held to be an important attribute of an effective systems leader. Clearly, in cases like this, the command and control form of management is unlikely to hold much credibility with those being led: command and control implies substantial- if not absolute - confidence on the part of the leader that doing X will lead to Y result, and a fair degree of certainty regarding the key variables that might influence the outcome of a situation. Neither of these conditions is satisfied in conditions of emergence.

Related to emergence is the necessity of working with diversity and conflict during systems change initiatives: '*cooking the conflict'* as it has been called (Heifetz and Linsky, 2002; Ghate et al, 2013). Cooking the conflict means orchestrating and working creatively (i.e.

raising and lowering the heat) with the tensions that arise when diverse actors engage in a process, with all their differing perspectives, differing preferences, and differing analyses of what has happened and what should happen. This requires skilled facilitation, negotiation and intermediation by the systems entrepreneur who is helping to galvanise change.

'Hearing all the voices' has long been advocated for adaptive leadership, so that it is not just the usual holders of power and influence who contribute to the change process (and who will likely have contributed to the development of the status quo and have a vested interest in its maintenance), but those whose experience and thinking may be different, who have less to lose, and might genuinely introduce change into a system. Active seeking-out of diverse and contradictory perspectives is therefore advocated for systems change leadership (Ghate et al, 2013). Although much has been written about the concept of resistance to change as a force for inertia, recent analyses have begun to take the view that resistance, and resistors, may hold the key to understanding how to improve change projects (Greenhalgh et al, 2014; Ghate, 2017) through their experiential knowledge and the risks and costs of change that they may identify.

5.10 Co-creation

Because of the necessity to work across boundaries, authors from disparate fields are united by a general agreement that successful change efforts – and perhaps especially successful *systems* change efforts - have a basic requirement for co-creation[5]. Co-creation is defined by Pfitzer et al (2004) as a co-process "*deeply involving stakeholders in identifying all dimensions of the problem and designing and implementing solutions*". It is important to note that defined like this, co-creation goes well beyond 'consultation' or 'collaboration' or 'joint working' as we generally use those terms. It involves policy makers and service designers actively sharing and ceding power with service users and front-line service providers: the power to define the problem in the first place, and the power to agree the most effective and appropriate response (Bason, 2010). Co-creative strategies (such as pooling funding) involve "*ceding credit and control – and persuading local partners to give up a bit of their in return… in the name of achieving progress that will actually last. That is*

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[5] Co-*production* is a related but slightly different term, somewhat more limited in scope, including designing and delivering new services or products across sectoral or professional boundaries.

the essence of system change... taking ego out it" (Walker, 2017). Although writers from different fields use different terminologies for the various co-processes that allow systems change agents to '*do with*' rather than '*do to*' or '*do for*' (Ghate, 2016; Bason, 2010), co-creative activities when sensitively used can help realign longstanding adversarial or competitive relationships that can impede systems change and which play facilitating and constraining roles in systems in multiple ways (Ghate et al, 2013; Foster-Fishman et al, 2007, p208).

5.11 Perfection is the enemy of the good (and over-planning is the enemy of execution)

For a social scientist, perhaps one of the most counter-intuitive (and also the most liberating!) themes in the literature on how and when systems change can be most effective concerns the admission by several writers, based in real-world experience, that in systems change, "*we have to make it up as we go along*". Green, 2016, suggests that this is a respectable strategy - indeed, the only strategy - for a serious change agent.

This is not an apology for having an unthinking or unplanned or unsystematic approach; rather it is an acknowledgement that the properties of emergence and unpredictability, and the sheer volume of unknowns (including 'unknown unknowns', in Donald Rumsfeld's now infamous formulation in June 2002) in a systems change effort within a complex context require endless adaptation and flexibility, as well as humility (Mowles et al, 2008) in the face of the challenge. In a systems change effort it is simply impossible to predict everything that may happen in advance (recall that this is the very definition of a 'complex system'), and thus spending too much time planning and strategising may well be wasted effort in the face of what actually unfolds in real time. Or as the famous saying goes: "no plan survives contact with the enemy". Thus, Green quotes the irrigation scientist Robert Chambers' phrase '*Ready? Fire! Aim!*' to describe the process of do - and then re-do - in the light of the learning.

> "*No amount of upfront analysis will enable us to predict the erratic behaviour of a complex system...(the optimal approach) interweaves thought and action, learning and adapting as we go*" (Green, 2016, p245).

Others observe that Foundations pursuing systems change agendas often overdo the preparatory strategic planning stage, when

> *"the real rigor needs to happen after the strategy has been developed, through intentional feedback loops that help surface information, re-examine assumptions, and course-correct strategy"* (Gopla and Kania, 2015).

Mowles and colleagues similarly give a robust critique of the log-frame approach favoured by international development and public health agencies, whose planning processes, while giving all the appearance of rigor and systematisation, actually succeed in over-simplifying the real complexity of the situation that workers on the ground will face, and overriding local intelligence and intuition about what will work in specific local settings (Mowles et al, 2008). They comment that 'failure' against deliverable targets in these settings is penalised by agencies (or funders), when the whole learning from complexity studies is that the essence of systems change in complex contexts will always be to learn by trial and error. This is not to do away with the methods that in theory help to structure thinking and action such as P-D-S-A (Plan, Do, Study, Act - Deming, 1994) just to note that 'planning' in this context may have its limitations.

5.12 Measurement – but go carefully

The same principle of less is more may be true of measurement: a heresy for many evaluation scientists and for almost all present-day funders, who have for many years made rigorous and comprehensive evaluation a condition of funding (Ghate, 2015). Measurement may however be a double edge-sword for system change. On the one hand, measuring (and publicising) descriptions of the status quo ('naming and shaming') or the results of attempts to change it can be a very powerful incentive to continuous improvement. For example, in 2012 a systems change initiative to bring the high speed internet to more schools in the US known as *EducationSuperHighway (ESH)* (https://www.educationsuperhighway.org/) created public measures of broadband speed and availability in school districts across the US using a diagnostic website, with the help of 100 partners (revealing in the process that 63% of school districts lacked the broadband required fir digital learning). Not only was this valuable data for the initiative, but it raised public awareness of the problem and *"created*

added incentive for states to keep up" (Walker, 2017). The data are regularly updated, so everyone can check on progress.

Clarifying what outcomes we expect is also an essential element of constructing a theory of change. It helps organisations and individuals engaged in change orient to their goals and chosen methods, check assumptions about links between inputs, activities and results, and explain to others why they think their efforts are worthwhile (Ghate, 2016/2018 FL ?*in press*?). But since the essence of systems change is that we expect the unexpected, again, devising metrics in advance may be extremely challenging, and much resource may be wasted taking measurements that turn out to be beside the point. Rather little has been written about evaluating systems change (though see Pawson and Tilley, 1997; Coffman, 2007 and Linkins and Brya, n.d) but what is clear is that our current arsenal of 'gold standard' experimental methods (Randomised Control Trials, or RCTs) are proving deeply inadequate to this task, and possibly even downright counter-productive (Cartwright and Hardie, 2012; Deaton and Cartwright, 2017; Ghate, 2015). Arguably, devised in the first instance for clinical trial research, they were never designed to accommodate the shifting and uncontrollable realities of change in complex systems. This can make evaluation design, and in particular devising metrics for evaluation extremely challenging for those assessing the progress and results of systems change efforts. Eoyang (2011, 320) for example notes that "*the nature of complex adaptive systems sometimes precludes traditional research approaches to theory building and testing where research is judged according to its validity and reliability*" and reports that it is 'unreasonable' to compare different complex situations and expect to use methods that hold equal rigour for both purposes. Ghate (2015) notes that experimental methods have as an essential element at the heart of their design the attempt to *reduce* real world complexity and 'noise', making them unsuited to capture the context and 'confounders' that '*lie at the heart of diffusion, dissemination and implementation of complex interventions'* according to Greenhalgh et al (2004). Eoyang calls strongly for mixed methods at a minimum when observing change in complex systems and recognition that "*whilst some facets of a situation can and should be bounded and measured*" (which may allow for quantitative measurement techniques), "*others will enfold such high dimension, unique, and unpredictable phenomena that measurable indicators are meaningless*" (Eoyang, 2011, 329). This is a challenging message for the sector to hear after

years of pursuing the ideal of 'evidence-based' intervention in the social sphere. But it is one that must be accepted if we are to match attempts to document effectiveness of systems change with the reality of the work 'on the ground'. The solution is probably not to cease measurement, but to measure different things ("*expanding the scope of the knowledge that we seek*"; Ghate, 2015). The foci, methods and metrics of evaluation for systems initiatives need to be quite different to those of usual outcome and process evaluations for 'point' interventions.

5.13 The components of effective systems change

As will be apparent from this review, the literature on systems change is broad and fascinating. Many disciplines and field of study contribute to it, and only a fraction of the literature that could potentially be relevant has been covered here. Theory far outweighs the practice evidence, however, and given the sheer scope and ambition of systems change as a concept, the absence of empirical data on impact and outcomes of planned systems change initiative is perhaps not surprising. If one takes the notion of a 'system' seriously, with all its characteristics of complexity and emergence, it may be that there can be no such thing as a 'systems change initiative' (singular) in the human wellbeing sphere, but only 'systems change initiative*s*' (plural): aggregations of activity that each work on an identified element of an issue, but which try to use systems thinking and the tools of cross-systemic co-creation and systems leadership to join the effort meaningfully across boundaries but around an agreed direction of travel.

However, in conclusion, the literature does suggest a number of specific features that characterise working with a systems-change ambition. These features seem especially relevant when considering work in the social sphere, on human welfare and wellbeing and on services for people, but they might well also apply to other systems-change work (environmental improvement, for example). They are summarised in Box 4 below.

Box 4 – Common features of an effective 'system change' initiative

An effective systems change initiative:

- focuses on the *root* causes of a problem and has prevention built into its model
- works (though not necessarily simultaneously) at *multiple levels* of the relevant ecosystem: for humans - individuals, families, communities, organisations and businesses (commercial, governmental and non-profit), and institutions (e.g judiciary and law, education, political governance, policy-making, funding)
- works at *apparent* and *deep* structural levels (apparent = visible and most malleable - resources and capacity, including people, operations, management and administration procedures; behaviours; deep = invisible, normative and most stable – attitudes, beliefs, assumptions, relationships, power dynamics, identity, obligations and responsibilities)
- *works with what is there already*: does not displace/replace but amplifies good work already in progress locally, and helps to join partners together to achieve common goals
- *works top-down* (targeted at central policy and regulatory structures, both national and international as appropriate) AND *bottom-up* (supporting communities and grassroots organisations, and local practitioners and individuals)
- *uses co-creative methods* to define the problems and co-design the solutions, and creating joint agreements on 'public value' and indicators of success
- *uses data and feedback intelligently* to assess and review processes as well as outcomes, uses diverse methods, and matches evaluation methods to the complexity of systems change efforts
- recognises that diversity of approach matched to local context is the key to systems change and does not impose an inflexible model for 'how to do it' but is open to *contextually sensitive adaptation*
- *learns by doing*: explores thoroughly and plans carefully before intervention starts, but recognises that plans must be flexible and are likely to require reformulation as experience of 'doing' accumulates

Section 6

References

Abercrombie R, Harries E and Wharton R (2015) *Systems change: a guide to what it is and how to do it* NPC and Lankelly Chase https://www.thinknpc.org/publications/systems-change/

Ackoff R (1974*) Redesigning the future: a systems approach to societal problems* New York: John Wiley

Balfour D (2017) *Want big social change? Find a systems entrepreneur* Huffington Post 1 October 2017
https://www.huffingtonpost.com/entry/want-big-social-change-find-a-systems-entrepreneur_us_587539e1e4b0a5e600a78f49

Bason C (2010) *Leading public sector innovation: co-creating for a better* society Bristol: Policy Press

Behrens TR and Foster-Fishman PG (2007) 3 Developing operating principles for systems change *Am J Community Psychol 39* 411-414

Berryman A (1981) *Population systems: A general introduction* New York: Plenum

Boulton J.G, Allen P. M and Bowman C (2015) *Embracing complexity: strategic perspectives for and age of turbulence* Oxford: OUP

Cartwright N. & Hardie J. (2012) *Evidence-Based Policy: A practical guide to doing it better* Oxford: Oxford University Press

Cassam Q (2017)   *Change can disturb our peaceful existence: are we right to resist it?* Podcast for *Philosophy 24/7 :* http://www.philosophy247.org/podcasts/no-change/

Checkland P. and Poulter J (2010) Soft Systems Methodology in *Systems approaches to managing change: a practical guide* M. Reynolds and S. Holwell (Eds) 191-242

Christensen, C., Grosman, J. H. & Hwang, J. (2009) *Innovator's Prescription*. McGraw-Hill Professional.

Churchman CW (1968) *The Systems Approach*. New York: Dell

Coffman J (2007) *A framework for evaluating systems initiatives* USA: Build Initiative
http://buildinitiative.org/WhatsNew/ViewArticle/tabid/96/ArticleId/621/Framework-for-Evaluating-Systems-Initiatives.aspx

Crossley S (2015) The Troubled Families Programme: the perfect social policy? *Centre for Crime and Justice Briefing 13, November 2015*
https://www.crimeandjustice.org.uk/sites/crimeandjustice.org.uk/files/The%20Troubled%20Families%20Programme%2C%20Nov%202015.pdf

Deaton A and Cartwright N (2017) Understanding and misunderstanding randomised control trials *Social Science and Medicine* https://doi.org/10.1016/j.socscimed.2017.12.005

Deming W.E (1994, 2nd edition) *The New Economics: for industry, government, education* Cambridge. MA MIT Press

Eoyang GH (2011) Complexity and the Dynamics of Organizational Change In P Allen, S Maguire and B McKelvey (eds) *Sage Handbook of Complexity and Management* 319-334

Fixsen, D. L., Naoom, S. F., Blase, K. A., Friedman, R. M. & Wallace, F. (2005). *Implementation Research: A Synthesis of the Literature.* Tampa, FL: University of South Florida, Louis de la Parte Florida Mental Health Institute, The National Implementation Research Network (FMHI Publication #231). http://nirn.fpg.unc.edu/resources/implementation-research-synthesis-literature

Forrester J (1968) *Principles of Systems* Cambridge MA: MIT Press

Foster-Fishman PG, Nowell B and Yang H (2007) 3 Putting the systems back in systems change: a framework for understanding and changing organizational and community systems *Am J Community Psychol 39* 197-215

Gersick CJG (1991) 3 Revolutionary change theories: a multi-level exploration of the punctuated equilibrium paradigm *Academy of Management Review 16 (1)* 10-36

Ghate D (2015) From Programs to systems: deploying implementation science and practice for sustained real-world effectiveness in services for children and families
Journal of Clinical Child and Adolescent Psychology Volume 45:6: Good Enough? Interventions For Child Mental Health: From Adoption To Adaptation – From Programs To Systems DOI: 10.1080/15374416.2015.1077449

http://www.tandfonline.com/doi/full/10.1080/15374416.2015.1077449

Ghate D., Lewis J. and Welbourn D. (2013) *Systems Leadership: exceptional leadership for exceptional times* [on line] Nottingham: the Virtual Staff College

http://thestaffcollege.uk/wp-content/uploads/VSC_Synthesis_complete.pdf

Ghate D. (2016) *The Family Links 10-Week Nurturing Programme: developing a theory of change for an evidence-supported design* http://www.cevi.org.uk/docs2/Family%20Links%2010-Week%20Nurturing%20Programme%20Theory%20of%20Change%202016.pdf and https://familylinks.org.uk/why-it-works#10-week-Nurturing-Programme

Ghate D (2017) *Resistance to Change* Blog for the UK Implementation Society, November 16, 2017 https://www.ukimplementation.org.uk/uk-is-blog

Ghate D (2018 in press) Developing theories of change for social programmes: Co-producing evidence-supported quality improvement *Palgrave Communications,* in press)

Gopal S and Kania J (2015) Fostering Systems Change – five simple rules for Foundations seeing to create lasting social change *SSIR* Nov 20 2015

Green D (2016) *How change happens* Oxford: OUP

Greenhalgh, T., Robert, G, Macfarlane, F. Bate P. and Kyriakidou, O. (2004) 'Diffusion of innovations in service organisations: systematic review and recommendations' *The Milbank Quarterly 82:4* 581-629

http://onlinelibrary.wiley.com/doi/10.1111/j.0887-378X.2004.00325.x/pdf

Greenhalgh T., Stones R and Swinglehurst D (2014) Choose and Book: a sociological analysis of 'resistance' to an expert system *Social Science and Medicine Vol 104* 210-214
http://www.sciencedirect.com/science/article/pii/S0277953613006904

Heifetz R and Linsky M (2002) *Leadership on the line: staying alive through the dangers of leading* Harvard Business School Press

Heifetz R., Grashow A. and Linsky M (2009) *The practice of adaptive leadership* Boston: Harvard Business Press

Kirsch V, Bildner J and Walker J (2016) Why social ventures needs systems thinking *Harvard Business Review July 25th 2016* reprint HO3125

Kuhn. TS (1970) *The structure of scientific revolution* (2nd edition) Chicago: University of Chicago Press

Levinson D. J (1978) *The Seasons of a Man's Life* New York: Knopf

Lewis J, Welbourn D and Ghate D (2013) *Systems Leadership: source paper 3, Leadership Scenarios* http://www.cevi.org.uk/docs/Systems_Leadership_Source_Paper_3_Leadership_Scenarios.pdf

Linkins K and Brya J (n.d) 3 *Systems Change Framework [= for evaluation and monitoring of grantees]* Desert Vista Consulting www.desertvistaconsulting.com

Macdonald G (2002) Transformative unlearning: safety, discernment and communities of learning *Nursing Enquiry 9(3)* 170-178

Meadows D H (1999) *Leverage points – places to intervene in a system* The Sustainability Institute

https://groups.nceas.ucsb.edu/sustainability-science/2010%20weekly-sessions/session-112013-11.22.2010-managing-for-sustainability-speaker-pamela-matson/supplemental-readings-from-the-reader/Meadows.%201999%20Leverage_Points.pdf/view

Meadows D (2008) *Thinking in Systems – a Primer* Vermont: Chelsea Green

Metz A and Albers B (2014) 'What Does it Take?: How Federal Initiatives Can Support the Implementation of Evidence-Based Programs to Improve Outcomes for Adolescents' *Journal of Adolescent Mental Health 54* (2014) 592-596

Midgley G. (2000) *Systemic intervention: philosophy, methodology and practice* Kluwer/Plenum: New York

Midgley G and Pinzon LA (2011) Boundary critique and its implications for conflict prevention *Journal of the Operational Research Society 62,* 1543–1554. doi:10.1057/jors.2010.76

Morecroft J (2010) System Dynamics in *Systems approaches to managing change: a practical guide* M. Reynolds and S. Holwell (Eds) 25-86

Mowles C (2014) 3 Complex, but not quite complex enough: the turn to complexity sciences in evaluation scholarship *Evaluation 20 (2)* 160-175 (theories of change, systems and over-simplification of emergent properties of human social life)

Mowles C, Stacey R and Griffin D (2008) What contribution can insights from the complexity sciences make to the theory and practice of development management? J*. Int Dev 20* 804-820

NESTA (n.d) *Radical efficiency – practical guide*
https://www.nesta.org.uk/sites/default/files/radical_efficiency.pdf

Olson E.E and Eoyang G H (2001) *Facilitating Organisation Change: lessons from complexity science* San Francisco CA: Jossey-Bass/Pfeiffer

Pawson R & Tilley N (1997) *Realistic Evaluation* London: Sage Publications

Pfitzer M, Bocksette V and Stamp M (2013) Innovating for shared value *Harvard Business Review* http://hbr.org/2013/09/innovating-for-shared-value/ar/pr

Reynolds M and Holwell S (2010) *Systems approaches to managing change: a practical guide* London, Springer

Rittel H.W.J. and Webber M.M. (1973) 'Dilemmas in a general theory of planning' *Policy Sciences 4:2* 155-169

Rogers E. M. (1995) *Diffusion of Innovations* Fourth Edition New York: the Free Press

Rushmer R and Davies H (2004)   Unlearning in Health Care *Quality and Safety in Health Care 2004 13 (Suppl II)* :ii10–ii15. doi: 10.1136/qshc.2003.009506

Seddon J (2008) *Systems thinking in the public sector* Exeter: Triarchy Press

Senge PM (1990, 2006) *The Fifth Discipline: the art and practice of the learning organisation* London: Random House

Stacey, R. (2006) Learning as an Activity of Interdependent People. In *Complexity And Organization: Readings And Conversations* R. MacIntosh, D. MacLean, R. Stacey & D. Griffin (Eds.) 237–246 London and New York: Routledge

Ulrich W. and Reynolds M (2010) Critical Systems Heuristics in *Systems approaches to managing change: a practical guide* M. Reynolds and S. Holwell (Eds) 243-292

Vexler D (2017) What exactly do we mean by systems? *SSIR* June 22 2017

Walker JC (2017) Solving the world's biggest problems: better philanthropy through systems change *SSIR* April 5 2017

Welbourn D., Warwick R., Carnell C., and Fathers D. (2012) *Leadership of whole systems London: Kings Fund* [on line: http://www.kingsfund.org.uk/publications/leadership-engagement-for-improvement-nhs]

Appendix

Method

The method for the overview was a tailored, narrative literature search, firmly focused on real world applications for the learning. Grey literature, books and on-line materials as well as peer-reviewed publications were searched, given that much of the writing on systems change originates in the practice literature. Key words were identified and used as the basis for automated and hand searches for relevant journals, books, magazines and reports; literature trails were followed; experts in the field were consulted. The methods were rapid and pragmatic rather than exhaustive and systematic. Major themes were identified and sorted by the author, and formed the basis of the analysis for the main part of the overview.

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