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Putting the system back into systems change: a framework for understanding and changing organizational and community systems

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Abstract Systems change has emerged as a dominant frame through which local, state, and national funders and practitioners across a wide array of fields approach their work. In most of these efforts, change agents and scholars strive to shift human services and community systems to create better and more just outcomes and improve the status quo. Despite this, there is a dearth of frameworks that scholars, practitioners, and funders can draw upon to aid them in understanding, designing, and assessing this process from a systemic perspective. This paper provides one framework—grounded in systems thinking and change literatures—for understanding and identifying the fundamental system parts and interdependencies that can help to explain system functioning and leverage systems change. The proposed framework highlights the importance of attending to both the deep and apparent structures within a system as well as the interactions and interdependencies among these system parts. This includes attending to the dominant normative, resource, regulative, and operational characteristics that dictate the behavior and lived experiences of system members. The value of engaging critical stakeholders in problem definition, boundary construction, and systems analysis are also discussed. The implications of this framework for systems change researchers and practitioners are discussed.

Keywords Systems change · Comprehensive community change · Deep structures · Second order change · Comprehensive community initiatives

Introduction

Systems change has been the focus of a variety of national, foundation, and state initiatives devised to improve urban neighborhoods and the human services delivery system. In these efforts, systems change refers to an *intentional process designed to alter the status quo by shifting and realigning the form and function of a targeted system*. Organizations, service delivery networks, poor neighborhoods, and even whole communities are often the systems targeted in these efforts. In most system change endeavors, the underlying structures and supporting mechanisms that operate within a system are altered, such as the policies, routines, relationships, resources, power structures, and values (Foster-Fishman, 2002). Overall, systems change initiatives are rooted in the assumption that significant improvements in the outcomes of a targeted population (e.g., reduced mental health problems in children; increased employment rate for people with disabilities) will not occur unless the surrounding system (e.g., service delivery system) adjusts to accommodate the desired goals (Cohen & Lavach, 1995). Some recent examples of systems change efforts include the systems of care movement that aimed to build a more coordinated service delivery system for children with mental health concerns and comprehensive community initiatives that seek to rejuvenate poor neighborhoods in ways that recognize the interconnectedness across social issues, promote resource access and build resident power.

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Although system change efforts in the human services or community change fields have become increasingly popular, this popularity has significantly outpaced their proven success. In fact, many systems change efforts report outcomes that are far less than what was promised or hoped for (e.g., Amado & McBride, 2002; King-Sears, 2001; Traynor, 2000). Certainly, systems change efforts are complex and challenging. However, we submit that limitations embedded in the conceptual frameworks used to understand, design, and assess systems change efforts are a key contributor to these disappointing results. More specifically, we posit that most systems change efforts have not fully attended to the dynamics and properties of the contexts they are attempting to shift. Simply put, systems change efforts are intended to *change systems*; yet, many systems change efforts ignore the systemic nature of the contexts they target and the complexity of the change process.

One purpose for this paper is to link the practice of systems change work to the bodies of science best positioned to inform one's thinking about systems and the process of change. We propose a framework for conceptualizing systems change that is grounded in two literatures we argue are well positioned to serve this goal: the fields of *systems thinking* and *organizational change*. We start first by briefly describing two systems change efforts that we use to illustrate our framework. We then examine what we can learn about systems and change from existing literature and present a systems change framework that is grounded in this literature. The implications of our framework for the field of systems change are then discussed.

Two examples of systems change

A comprehensive community initiative

Starting in the 1990s, many foundations and federal agencies began to shift the strategies they used to tackle significant social problems. Recognizing the failure of discrete programs to address entrenched and unstructured social issues, funders created comprehensive community initiatives (CCIs) that were designed to: (1) address problems holistically and at multiple levels; (2) engage residents as architects of the design and implementation efforts; and (3) promote sustainable systems change.

In 2001, we became involved as evaluators and technical assistant providers for one CCI designed to address the inequities in educational and economic outcomes in one city. During its first phase, this CCI aimed to build the power of residents in low income neighborhoods by providing them with the resources (e.g., mini-grants, community organizing support, training and mentoring in

leadership and change) to increase their readiness and capacity for collective action. The program designers assumed that this provision of resources would serve as a catalyst for collective action among and between residents and local organizations *and* through this action, social, economic and educational support systems would become better positioned to improve educational and economic conditions within the community.

Systems change in the disabilities arena

The disabilities services arena has experienced numerous systems change efforts during the past 45 years. One shift that occurred in the 1990s was triggered through the reauthorization of the Rehabilitation Act. This reauthorization introduced the concept of consumer empowerment, requiring rehabilitation organizations to shift from a provider-designed service model to one where clients identified their own vocational goals and rehabilitation plans. Allocations of funds were then to be used to support client goals. The first author provided evaluation and technical assistance services to several agencies during this transition.

What is a system?

To build a framework for systems change, it is first important to define what we mean by a "system." At their most basic level, systems are generally considered to be a collection of parts that, through their interactions, function as a whole (Ackoff & Rovin, 2003; Maani & Cavana, 2000). Given this broad definition, the term "system" can be used to describe a wide array of phenomena. For example, from a social science perspective, systems include a family, a neighborhood, an organization, a school district, a human service delivery network, a coalition of organizations, or the federal welfare system. Within the context of systems change, what we refer to as "the 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.

System properties

It is our position that systems change requires a systemic perspective in thinking about the targeted issue and the change process. This means that, beyond a general definition of systems, the development of a systems change framework requires clarifying how one thinks about and defines the properties of systems. System properties refer to the underlying principles that guide system behavior. Attention to these properties is critical, given that one factor challenging the field of systems change is the pre-

ponderance of mental models¹ that are ill equipped to accommodate the actual characteristics of systems. In spite of the growing recognition of the complexity of systems (Kim, 1999; Senge, 1990), the mental models that guide most systems change interventions continue to view the relationship between a systems change intervention and outcome as predictable, uni-directional, and sequential (Supovitz & Taylor, 2005). As in our disability example, many systems change efforts focus their attention on leveraging change in a distinct system part—such as a federal or state policy—with the expectation that this change will result in the outcomes desired (See Fig. 1 for an illustration of this point). Yet, current understandings of systems (e.g., Senge, 1990) highlight that most systems contain a complex web of interdependent parts: leveraging change in one part will lead to the desired outcome *only if* concurrent shifts happen in the relational and compositional elements of the system (See Fig. 2). Thus, a conceptual gap between how change agents *think* about systems change (Fig. 1) and the actual reality of how systems function has emerged (Fig. 2). We argue that it is exactly this conceptual gap that has contributed to the failure of many systems change efforts.

One discipline that provides insight into how to address this gap is the world of systems thinking. For the purposes of this paper, we consider systems thinking as “a general conceptual orientation concerned with the interrelationships between parts and their relationships to a functioning whole” (Trochim, Cabrera, Millstein, Gallagher, & Leischow, 2006, p. 539). In other words, systems thinking is a conceptual way of seeing the world based on systems principles.

Within the broad discipline of systems thinking, there are multiple theories to draw upon (e.g. Checkland, 1981; Olson & Eoyang, 2001; Senge, 1990). These different theories provide somewhat competing perspectives on how to define, understand, and change a system. For this reason, it is essential for those engaged in systems change to locate their approach to systems within this larger literature. Due to our focus on applying system principles to the real world practice of systems change, we focus our attention on two approaches within the applied area of system intervention: soft systems methodology and system dynamics. For those within the systems thinking field, this marriage may at first cause pause as these approaches have fundamentally different epistemological assumptions underlying their dominant methodologies (See Lane & Oliva, 1998 for an analysis of these differences). However, we believe an

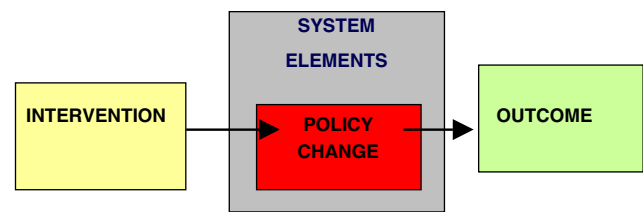


Fig. 1 Common example of a systems change intervention model

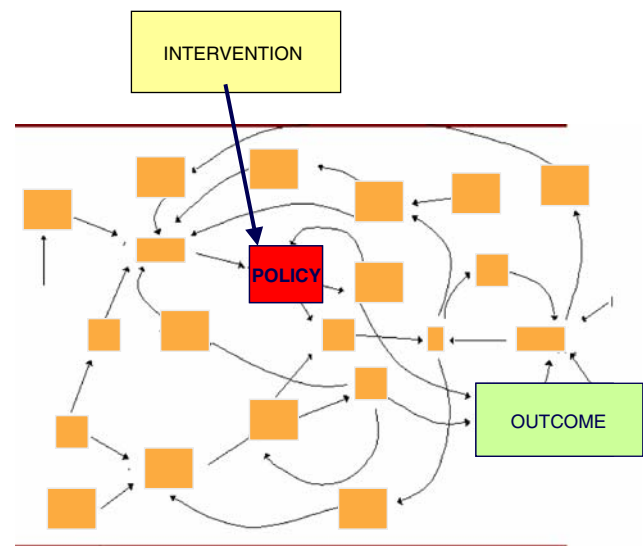


Fig. 2 Our proposed model of systems change

integration of their conceptual orientations creates a robust intellectual foundation for systems change. In particular, each approach pursues a process to create a systemic awareness of a problem situation; yet, their methods shed light on different systemic elements. Thus, their merger provides a more comprehensive understanding of system functioning. Below we describe these two approaches and their contributions to our framework.

Soft systems methodologies Soft systems methodology (SSM), developed by Checkland (1981), has made a critical contribution to system thinking by challenging the notion that systems built around human activity (e.g., a system for addressing poverty) are subject to the same assumptions of functional objectivity used in understanding systems in the natural/physical world. Specifically, Checkland argues that properties of human activity systems (e.g., the function or purpose of the system, definitions of the problem, and relevant system boundaries) are often subject to the eye of the beholder and therefore may be experienced and understood differently by different stakeholders, based upon their position, role, and experiences (Flaspohler et al., 2003).

¹ Mental models, or theories in use (Argyris & Schon, 1974), are cognitive frameworks based on our knowledge and assumptions about how the world works that are used when conceptualizing and acting on a given task (Senge, 1990).

Because of this, SSM focuses on engaging multiple stakeholders in developing multiple “rich pictures” (Checkland, 1990) of a problem situation and desired state, each of which is understood to reflect a given world view rather than an objective reality. Checkland highlights that this process should not strive for consensus, but instead seek to find ways for stakeholders to accommodate these different worldviews. Further, SSM encourages change agents to resist purely structural or mechanistic frameworks when analyzing problems and to consider the social, cultural, and political elements as well. Thus, in developing an understanding of a system (what Checkland calls the problem situation), our framework for systems change incorporates ideas from SSM by:

- (1) *Emphasizing the subjective nature of systems analysis.* This includes gaining insight into the different stakeholder interpretations of the problem situation and recognizing that the feasibility of solving a problem depends largely on how many and which perspectives are selected for understanding the problem (Checkland & Scholes, 1990).
- (2) *Recognizing that systems change is as much of a process as an end state.* Similar to Checkland and others (e.g., Midgley, 2000), we emphasize the importance of an ongoing and iterative approach to systems analysis and solution development.
- (3) *Emphasizing the importance of examining the political, social, and cultural aspects of a system* when identifying relevant system parts.
- (4) *Attending to both the experienced realities of system life and the desired state* with the goal of identifying gaps between the two so levers for needed change can be identified.

System dynamics thinking Started by Forrester (1969), this approach has sought to apply general systems thinking principles to managerial and societal issues by looking to the patterns of cause and effect relationships within a system to explain system behavior (Forrester, 1969; Jackson, 2003; Senge, 1990). Toward this end, this approach provides valuable principles for understanding *system structure* including interaction characteristics, the role of feedback, the implications of delays between actions and consequences, and how unexpected consequences from actions can create new conditions or problems. These insights, in turn, can help one recognize meaningful patterns within the system and discover significant levers for change. Finally, system dynamics theorists focus on understanding root causes underlying a given issue. That is, they seek to identify originating factors within a system which give rise to an identified problematic outcome. In

sum, the theories behind system dynamics contribute to our framework by:

- (1) Providing tools (e.g., positive and negative interactions, delays) for *structuring our thinking about the patterns of the interaction between system elements* and the potential implications of those interactions for the system as a whole.
- (2) Emphasizing the importance of *identifying root causes* when engaged in a systems analysis.

In conclusion, the systems change framework presented in this paper incorporates insights from Soft Systems Methodologies and Systems Dynamics Thinking to guide the assessment of system functioning and to identify potential levers for change. While our approach does not require the full application of the methods embedded in these approaches (i.e., systems dynamics computer modeling), change agents and researchers could select to use these tools in their efforts while applying our framework.

What is change?

Since our interest in understanding and conceptualizing systems is related to how to effectively *change* their form or function, it seems imperative to examine what we mean by the concept of change. Several disciplines have dedicated themselves to understanding and explaining the change process, particularly the field of organizational sciences, and much can be learned by drawing upon the theories within that field. Like the systems thinking literature described above, the change literature has a diversity of perspectives available and these distinct approaches have important implications for how one conceptualizes change and identifies the factors to leverage for change. We describe below the theories we have drawn upon to form our conceptualization of change and present the implications this has for our approach to systems change.

Clarifying the type of change

Change theorists acknowledge that there are multiple forms of change and that these different types of change achieve different ends, are used in different contexts, target different factors, and encounter different forms of resistance (e.g., Van de Ven & Poole, 1995; Weick & Quinn, 1999). For the purposes of our approach to systems change, we focus our use of the change concept around two dimensions: (a) the nature of the change pursuit, in particular whether it is episodic or continuous (Weick & Quinn, 1999); and (b) the degree of change, in particular the extent to which the change is incremental or radical in nature (Watzlawick et al., 1974).

The nature of change Change theorists distinguish between episodic change efforts and those that are more continuous or emergent (Weick & Quinn, 1999). For our model, we are primarily focused on the dynamics of episodic change pursuits because they represent the dominant approach to reforms in the human service systems and community change field. Episodic change pursuits tend to be planned (rather than emergent), driven externally (such as from a funder or federal policy requirement), occur in a relatively bounded time period, and often emerge because there is somewhat of a misfit between the system and its environment. Usually this means that the system is not effectively meeting the goals it was designed to achieve or a new purpose or goal for the system has been externally mandated. The disabilities services example (with the goal of consumer empowerment) illustrates the type of episodic change effort that frequently occurs under the rubric of systems change. Through a radical shift in federal policy and funding, the vocational rehabilitation service system became the target of a dramatic change effort aimed at altering how and what types of services were available.²

The degree of change Episodic change efforts are transformative in terms of the degree of change they target (Weick & Quinn, 1999). In the field of organizational sciences, much attention has been given to the types of changes that are needed to bring about desired end states (Bartunek & Moch, 1987; Watzlawick et al., 1974). *First-order change* involves making sure things are done right by making incremental improvements within existing modes of practice - for example, trying to improve educational outcomes in poor urban neighborhoods by making improvements or adjustments to existing curriculum or school-based programs (i.e., doing the same things better).

In contrast, *second-order or radical change* involves a paradigm shift in how a problem is perceived and what strategies are used to address it; how things are done is fundamentally altered within the targeted context. For example, when examining the poor performance of urban schools, school administration and city leaders recognize the pattern of poor urban schools receiving fewer resources

and supports than white suburban schools. The issue of poor school performance then becomes conceptualized as larger than just the need to improve school curriculum. The need to shift school district and state policy, practices, norms, and values so resources become more equitably distributed is recognized as the more fundamental and crucial issues to address. When the root of the problem rests in the fundamental nature of the system, attending to second-order change is more likely to lead to more comprehensive and long-term solutions because it requires attention to the underlying root causes of a problem. By addressing these root causes, change agents can ultimately shift the status quo (Seidman, 1988). This is the form of change most often targeted in episodic change efforts and thus is the focus in our approach to systems change.

What does this mean for systems change?

Given the above, what does it mean to engage in systems change? Our exploration of the systems and change literatures suggests that systems change is an episodic and transformative change pursuit that is fundamentally about shifting the status quo by altering the elemental form and function of a system. To do so requires: (1) understanding different perspectives concerning the problem situation; (2) locating root causes to systemic problems by identifying system parts and their patterns of interdependency that explain the status quo; and (3) using this information to identify leverage points that will cultivate second-order change.

This approach has several important implications for the field of systems change. First, it highlights the subjective nature of understanding systems and thus the importance of involving multiple stakeholders in the initial assessment and design stages of a systems change endeavor. In fact, the actual process of engaging stakeholders can serve transformative ends that support the systems change goals. When using approaches advocated for by Checkland (1981), Churchman (1970), Midgley (2000) and others, the act of having stakeholders explore and accommodate differences among competing worldviews can serve to create transformative shifts in stakeholders' understandings of the problems.

Second, it highlights the need for a *root cause analytic framework* to guide our identification of systems parts and interactions. Too often systems change agents identify system parts as the people and programs within a system without fully understanding *why* these system actors or settings behave as they do. Yet, consideration of the underlying causes of system behavior is essential if the goal is to alter the status quo (Seidman, 1988).

Third, it highlights that the focus of a systems change effort is not just a change in a system part as has commonly

² Of course, systems change can also happen as a continuous change endeavor. When systems change happens in this manner, it occurs as a result of ongoing continuous adjustments to a system's form and functioning so that ultimately these small shifts "cumulate and create substantial change" within the system (Weick & Quinn, 1999, p. 375.). In fact, episodic systems change efforts sometimes transform into continuous change efforts, particularly when systems effectively resist significant changes to their status quo. The focus in this paper is on the episodic form of systems change since that is the intended goal of most systems change effort and the type most often experienced (at least initially) by human service systems and communities through funding requests.

been the frame of reference for many initiatives. Rather, a systems view of change also requires a *focus on the interactions between system parts and the patterns that emerge from them* (e.g., Olson & Eoyang, 2001; Senge, 1990). Take again our example in the disabilities arena. Federal policy makers aimed to create significant change in how the disabilities services system provided rehabilitation services by providing the policies and resources needed to make this shift. However, the shift in policy and resources (system parts) did not lead to the other changes needed to support the goal of client empowerment, such as a shift in rehabilitation counselor practices and community employment opportunities. It is the pattern of interactions among parts that ultimately determine how, what, when, where, why, and for whom things happen in a system. This suggests that the outcome that should be of *primary* interest to a systems change agent is if—and how—a strategic change made in one part or interaction within the system influences (or fails to influence) other parts of the system and the subsequent results of these changes.

A framework for transformative systems change

Given the above, how does one start to understand and change systems? Our approach to transformative systems change involves four principal steps (see Fig. 3). The first step is to clarify how the system will be conceptualized vis-à-vis its external environment. Therefore, we begin with a discussion on how to “bound” a system. Second, we focus on understanding potential root causes to a given problem (e.g., Senge, 1990) by identifying *fundamental* system parts—those that can be linked to or explained as the

underlying causes of problems. Third, we move to a discussion of tools for conceptualizing and assessing patterns of interaction within a system. We conclude with a discussion of how to identify critical levers for change within a system.

We have designed our framework to be intentionally broad and encompassing given that broad conceptions of systems aid in our understanding of their complexity (Churchman, 1970). We assume, of course, that no one systems change effort can or should attempt to target all elements identified in this framework. Instead, this framework should be used more as an analytic and diagnostic guide by systems change agents, researchers, and evaluators to foster understanding of system functioning and identify critical levers for change. Ultimately, it is hoped that the framework helps to expand the mental models used to design and evaluate systems change efforts so that intervention and assessment models better fit with the underlying properties of how systems operate and change.

Bounding the system

Some systems theorists argue that establishing system boundaries is perhaps the most critical and defining process in a systems change intervention (e.g., Churchman, 1970; Midgley, 2000). When defining a system’s boundary, two questions need to be addressed: (1) What is the problem that should be targeted for assessment and intervention? and (2) Who and what is contained within the system given the targeted problem? What is important to note is that the most critical aspect to defining system boundaries is the process used to understand the system (e.g., Midgley, 2000). Because different stakeholders contribute different

Fig. 3 Essential components of transformative systems change

BOUNDING THE SYSTEM	UNDERSTANDING FUNDAMENTAL SYSTEM PARTS AS POTENTIAL ROOT CAUSES	ASSESSING SYSTEM INTERACTIONS	IDENTIFYING LEVERS FOR CHANGE
<ul style="list-style-type: none"> ➤ Problem definition ➤ Identification of the levels, niches, organizations, and actors relevant to the problem 	<ul style="list-style-type: none"> ➤ System norms ➤ System resources ➤ System regulations ➤ System operations 	<ul style="list-style-type: none"> ➤ Reinforcing and balancing interdependencies ➤ System feedback and self-regulation ➤ Interaction delays 	<p data-bbox="1230 1362 1394 1409"><u>Identifying Parts to Leverage for Change</u></p> <ul style="list-style-type: none"> ➤ Exerts or could exert cross-level influences ➤ Directs system behavior ➤ Feasible to change <p data-bbox="1230 1541 1449 1608"><u>Identifying Interactions and Patterns to Leverage for Change:</u></p> <ul style="list-style-type: none"> ➤ System differences that create niches compatible with systems change goals ➤ Long standing patterns that support or hinder change goal ➤ Gaps in system feedback mechanisms ➤ Cross-level/sector connections that are needed

perspectives, dialogic processes are needed to negotiate how the problem should be defined, and who and what should be considered critical to the targeted problem and solution.

Defining the problem situation

SSM (e.g., Checkland, 1981; Checkland & Scholes, 1990) emphasizes the articulation of the “problem situation” in their systems change efforts. A “problem situation” represents one worldview of the present problem and potential solution within a given context. According to Checkland, any one particular issue of concern can manifest a diversity of “problem situations” because different stakeholders perceive and value different aspects of the problem and potential solutions. Thus, the goal of a change agent is to engage multiple stakeholder groups in a process where they each articulate their perception of the problem and then examine and negotiate the similarities and differences across these worldviews.

Take for example our CCI. Though this initiative aimed to reduce structural inequities in educational and economic outcomes within the community, perceptions regarding why this problem existed (problem definition) within the community and what needed to be done to resolve it varied greatly. For example, staff and leaders within local human service agencies defined the problem as a “lack of resources”, claiming that local agencies did not have the staff and funding needed to meet the needs of low income residents and engage them in meaningful ways. Meanwhile, residents in low income neighborhoods believed that the problems stemmed from “a lack of voice”, noting that local service agencies did not meet their needs or listen to their concerns.

In our approach to systems change we adopt some of Checkland’s (1981) techniques, using mostly qualitative and large group discussion techniques to strive to learn the different ways stakeholders define the problem of interest and then work with them to propose a problem statement that accommodates these different perspectives. For example, an accommodating problem statement that emerged in our CCI was “Residents in low income neighborhoods do not have the capacity and power to affect change and organizations do not have the resources or capacity to effectively engage them in meaningful ways.”

Defining the system

Once we have an agreed upon problem statement, we then work to define and bound the targeted system. As noted above, some systems theorists argue that establishing system boundaries is perhaps the most critical and defining process in a systems change intervention (e.g., Churchman,

1970; Midgley, 2000). System boundaries are an arbitrary construction (Midgley, 2000); how we draw them has significant implications for what we consider in our analysis, what we can understand, whose perspectives we value, where we place our intervention, and what change we can leverage (Midgley, 2006). Thus, boundary lines have explicit values associated with them: by clarifying who is included inside and outside the boundary, explicit statements are made regarding the perspectives, roles, and functions that are critical to and valued within the system. Take for example the CCI described above. In this initiative, given the above problem statement, a range of boundaries could be drawn around the system. For example, should the targeted system include local businesses and city institutions? Should it include residents from higher income neighborhoods?

How does one determine the boundaries and thus what to include within a system? In addition to engaging multiple stakeholders to ensure the inclusion of diverse perspectives, attention to elements that are marginalized (meaning they are placed outside the system boundaries by one group but included inside the system by another) can shed important insight into system values and system conflicts (Midgley, 2001). Often, marginalized system components include alternative and non-traditional settings and individuals who are typically excluded from power and decision-making roles. In a systems change effort, the purposive inclusion of these marginalized elements within a system’s boundaries can significantly challenge dominant system values. For these reasons, the actual process of drawing system boundaries can serve as a lever for change.

Ultimately, the process of drawing boundaries within a system is a negotiated process among critical system stakeholders. Once a targeted problem is identified (as described in the previous step), stakeholders are asked to create a description of the surrounding situation or system. This includes identifying *system levels* (i.e., relevant, nested ecological layers relevant to the targeted problem), *niches* (i.e., settings, such as programs and activities, within system levels that promote unique behaviors and opportunities that are linked to or should be connected with the targeted problem), *organizations* (i.e., local organizations relevant to the targeted problem or population), and *actors* (i.e., individuals that are relevant to, vested in, or affected by the targeted problem). Table 1 includes the system description that emerged from our conversations with hundreds of low income residents, organizational members, and city leaders about the problem statement generated above for our CCI.

Why all of this attention to defining and bounding a system? Amado’s & McBride’s (2002) work in the field of disabilities provides some important insights into the importance of clarifying system boundaries. The initial

Table 1 Describing a system related to building resident power, organizational capacity, and resident engagement

System attributes	Example attributes:
System layers	Residents in poor neighborhoods Neighborhood blocks Elementary school catchment areas Service delivery system The city The region/state
Niches	Resident Advisory Boards for local organizations Neighborhood Planning Councils Neighborhood Associations Resident leadership development programs Neighborhood organizing efforts
Organizations	Churches Schools Human service agencies City government
Actors	Mayor Elected officials School Board members Resident leaders Church leaders Teachers Community workers

systems targeted in this change were human service delivery organizations that were attempting to implement a new philosophy and approach to services for people with disabilities called person-centered planning. Evaluations revealed that the degree to which any one agency succeeded at fully implementing this effort—and seeing real results in their clients—was related to the extent to which organizations actively worked to build support from other key agencies and groups within their respective communities. Thus, it was not simply the changes they created within their own organization that mattered; agencies need to create a larger service delivery system that supported the targeted changes.

As this research illustrates, system change efforts are more likely to succeed when they permeate multiple levels and niches within a system, creating compatible changes or conditions across system components (e.g., Cohen & Lavach, 1995). However, if the boundaries are drawn too wide, then the systems change effort can become cumbersome and unmanageable; if drawn too narrow then vital system pieces may be ignored.

Ultimately, it is critical to remember that all systems are bounded and these boundaries place limits on our understanding and our ability to leverage change (Midgley, 2000). By clarifying a system's boundaries, change agents and researchers are able to identify what they consider

outside the scope of an initiative and which system components they need to consider to ensure that compatible changes occur throughout the system. Of course, effective systems change efforts do not always mean concurrent actions at multiple system levels. What is of importance to the systems change agent is the *alignment* of critical system parts with the desired end state. Depending on the readiness of a system, sometimes identifying and shifting a key lever sets the whole system in motion towards a more desirable end state (Olson & Eoyang, 2001). The framework presented in this paper was designed to help change agents and researchers identify these critical levers.

Identifying fundamental system parts to leverage for change

Once system boundaries are defined, the change agent must then focus their attention on identifying what parts of the system to target that can affect change in the system as a whole. Fundamentally shifting the character of a system requires understanding and attending to those parts that maintain and constrain system patterns (Olson & Eoyang, 2001). Organizational theorists interested in second order or transformative change call these parts the deep or “below the surface” structures within a system (e.g., Gersick, 1991). Deep structures include the *normative*

elements of a system such as the attitudes, values, beliefs, expectations, and tacit assumptions that drive the behavior of its members (e.g., Schein, 1990). These structures maintain the system's existence, provide the background of what is considered the "status quo", and explain why and how the system and its members operate as they do (Gersick, 1991). Thus, they can often be identified as the root causes of system problems. According to Gersick (1991), real transformative change (i.e., systems change) will only occur within a system when the system's deep structures are altered. Cultural theorists have agreed, arguing that only by altering the underlying beliefs and values that direct daily practices and behaviors will significant system change efforts take hold and be sustained over time (e.g., Schein, 1990).

In addition to understanding the "below the surface" elements of a system, organizational culture theory recognizes that systems operate at another level that is likewise critical to discerning system operations and behavior: the "apparent" level (Scholtes, 1998). The apparent level refers to the system's visible elements and can include all that can be observed by others that might explain how and why a system operates as it does. Often, cultural theories include in their apparent level analysis the *regulatory processes*, including policies, procedures, roles and responsibilities, the *available resources*, including human and social capital, and *dominant operations*, particularly the power and control structures. Overall, the deep and apparent system elements are highly interdependent with each other; they both emerge from and maintain each other by working in conjunction to build meaning and clarity for system members. Together, they explain the system's purpose, define the roles for system members, and build structures for system operations. Thus, transformative systems change requires attention to both the deep, below the surface structures as well as the more visible system elements. Attention to both means that system change efforts are more likely to succeed because they will create a system whose parts are aligned with the new purpose or goal.

Given the above, we propose four major dimensions for identifying fundamental system parts operating at both the visible and deep levels within a system. These are similar to those identified by other systems change scholars (Fiorelli & Margolis, 1993; Parsons, 1997; Tushman & Romanelli, 1985), represent many of the core levers for change within a system that have been identified by systems thinking scholars (e.g., Meadows, 1999), provide insight into stakeholder worldviews (Checkland, 1981), and capture the range of factors often identified in root cause analyses processes: (a) *system norms*, including attitudes, values, and beliefs; (b) *system resources*, including the human, social, and economic capital available within the

system; (c) *system regulations*, including policies and procedures; and (d) *system operations*, particularly power/decision-making processes and structures. In our approach to systems change, we have found it useful to consider these dimensions across all system levels, niches, organizations, and actors identified in our system description because they often take on different characteristics in different pieces or subsystems within a system. In fact, differences within a system can shed light on tensions and patterns within the system and highlight where change is most likely to be leveraged or resisted (Olson & Eoyang, 2001).

One core premise guiding our approach is that while any one systems change effort is unlikely to have the resources to target every apparent and deep structure, it is essential to understand three attributes of each system part: (a) *its character within the system* including how it is *similar and different* across different system actors and subsystems, (b) the extent to which it *coheres with the goals of the systems change endeavor*, and (c) how it *influences and is influenced by other fundamental parts*. The information provided below and the questions included in Table 2 are designed to facilitate this analysis. As the below description illustrates, understanding the character and influence of any one part requires a simultaneous consideration of its interactions with other system characteristics.

System norms: attitudes, values, and beliefs

Stakeholders' worldviews determine how they see systemic problems and construct system solutions (Checkland, 1981). These worldviews, which include their values, beliefs, and attitudes, also dictate their behaviors. When these worldviews are shared by others, they can create a dominant normative context that determines the practices and functions of a system or subsystem (Fiorelli & Margolis, 1993; Schein, 1990).

When these normative beliefs are consistent with a new program or policy they can facilitate the adoption of these changes (e.g., Bartunek & Moch, 1987; Klein & Sorra, 1996); when they are not, they prove to be significant sources of resistance (e.g., Foster-Fishman & Keys, 1997; Shadish, 1984) and can significantly delay, if not derail, change efforts (Oetting et al., 1995; Wickizer et al., 1998). Because most systems change endeavors, by their very nature, typically challenge existing attitudes, values, and beliefs, some argue that a shift in these system norms is fundamental to the second order change targeted by these pursuits (e.g., Corrigan & McCracken, 1995; Sun & Scott, 2005).

For example, when shifting the service delivery system for people with disabilities towards a greater focus on self-determination and supportive employment opportunities,

Table 2 Guiding questions for examining critical systems parts and interdependencies

System characteristic	Guiding questions
Identifying System Norms	<ul style="list-style-type: none"> • What current assumptions explain why things are done as they are? What current assumptions support the systems change effort? Which ones might impede its success? • What are the “theories in use” that stakeholders use to explain why the targeted problem exists? • What are the values guiding current programs, policies, and practices within the system? What are the values guiding the proposed change? To what extent are these two congruent or compatible with each other?
System Resources	<p><i>Human Resources</i></p> <ul style="list-style-type: none"> • How will setting members be expected to behave if the systems change effort is successful? Do system members have these skills and knowledge sets now? • Are there local champions for the change? Do they know how to leverage change within the system? Do they understand how the system operates? What is needed to help system members develop this understanding? <p><i>Social Resources:</i></p> <ul style="list-style-type: none"> • To what extent are relationships among stakeholders a contributing factor to the targeted issue? In what ways? • What formal and informal relationships in the system explain “the way things are done around here”? • How will relationships need to shift in order for the proposed initiative to be successful? Who will need to interact with whom and what will be the nature of that interaction (i.e., information sharing, collective action)? • What aspects of the system might support or hinder relationship development? Are policies/procedures put into place to guide, support and encourage collaborative relationships, shared work, and service coordination? <p><i>Economic Resources & Opportunities</i></p> <ul style="list-style-type: none"> • Whose needs are prioritized in the ways that current resources are allocated and opportunities distributed? Whose needs are ignored? • What new resources or opportunities are needed to support the desired change? How does the system need to use its resources differently to support the goals of the initiative? Who might perceive this reallocation as a loss?
Identifying System Regulations	<ul style="list-style-type: none"> • What policies, practices and procedures exacerbate the problem you want to address? Which ones have made it difficult to fully resolve this problem in the past? • What current policies, practices and procedures are incompatible with the new or planned change? Which ones might get in the way of the systems change effort succeeding? • Is there a gap between the stated policy and implemented practices? If so, why? • What policies are not in place but are needed to fully support the goals and philosophies of new change? • What current practices or procedures are incompatible with the new or planned change? Which ones might get in the way of the systems change effort succeeding? • What practices are not in place but are needed to fully support the goals and philosophies of new change? • What practices or procedures exacerbate the problem you want to address? Which ones have made it difficult to fully resolve this problem in the past? • What daily routines will support and encourage the desired changes? Which ones might get in the way of this change being fully enacted?
System Operations: Power and Decision-Making	<ul style="list-style-type: none"> • What types of decisions are most critical to the functioning of the system and where does authority over these decisions rest? • What types of information and resources are most important to the system and who controls access to these resources? • Who are the social “movers and shakers” of the system? Do these individuals support the systems change effort? • How does the systems change effort challenge the existing power and decision-making structures? What new power bases or decision-making structures will need to be developed to support the goals of the initiative? What else within the system will need to be altered to support this new power structure?

Table 2 continued

System characteristic	Guiding questions
System Interdependencies	<ul style="list-style-type: none"> • How do deep and apparent structures (e.g., policies, attitudes, relationships) currently interact with each other? What do these interactions mean for the desired systemic change goal? • Where among the interdependencies seems to be the weakest link? Where is the longest delay moving from one part of the system to the other? What do these characteristics mean for your systems change effort? • Will strengthening an existing interdependency or adding/deleting a link accelerate the achievement of the desired change? • How can interdependencies within the system be leveraged strategically to promote sustainability of the desired change over time? What needs to be in place for the system to continue to “feed” and support this change? • What interdependencies between system parts could undermine sustainability of the change effort? • How do current feedback mechanisms support or impede system change goals? What additional feedback mechanisms could be added to facilitate systems change?

Corrigan & McCracken (1995) found that when local service providers and leaders did not believe in the philosophy of self-determination—and instead valued the sheltered workshop experiences they had been providing—the programmatic shifts did not occur. Thus, one aspect of assessing the attitudes and values within a system is to determine the extent to which they are congruent with the goals, values, and assumptions of the targeted change. While a positive attitude towards a systems change pursuit does not assure its adoption, it is unlikely that system transformations will occur in the absence of positive appraisals of the change (Armenakis, Harris, & Mossholder, 1993).

Case example In our CCI, the dominant norms within the community have often run counter to initiative goals; understanding them has helped to explain why resistance to the CCI efforts have emerged and what else needs to be done to more successfully leverage change. For example, one goal of this CCI is to promote partnerships and collective actions between residents and local organizations. Initially, the funder required all potential organizational grantees to describe in their grant applications how they partnered with residents in the design of the proposed program (an attempt to shift system regulations). However, none of the first round applicants met this expectation. Without putting the initiative work on hold, and with the intent of building public will, the funder decided to make grant awards based on other relevant criteria. Interviews with organizational leaders indicated that one reason for this lack of partnering was the belief that collaborating with residents was more resource intensive than worthwhile. With these insights in hand, the funder designed additional strategies to nurture norms more compatible with the partnership goal such as providing opportunities for networking between residents and organizations.

System resources: human, social, economic, and opportunity capital

The resources available within a system create significant implications for current and future system capacities. These resources encompass system “inputs” (Katz & Kahn, 1978) and determine what the system has available to enact its purpose and processes. Overall, we consider three forms of critical system resources in our framework: human, social, and economic/opportunity capital.

Human resources Human capital refers to the knowledge, skills, and abilities that exist within a system. Significant differences in human capital are present within most systems; how systems recognize and integrate these differences determine who gets access to other system resources, including social, economic and opportunity capital.

The available human capital can often constrain the successful pursuit of a systems change effort. Even if system members hold attitudes and values that are congruent with an initiative, they may not possess the knowledge, skills, or abilities needed to fully implement the system changes. Without these capacities, or the supports in place to foster their development, systems change efforts will not succeed (Klein & Sorra, 1996; Novak, Rogan, Mank, & Dileo, 2003). For example, Oetting and his colleagues (1995) found that when communities did not have service delivery professionals and leaders who were knowledgeable about prevention, substance abuse prevention efforts were less likely to be successful. King-Sears (2001) also found that significant educational policy reforms did not lead to real changes within the classrooms unless superintendents, principals, and teachers were skilled in implementing them.

Social resources As discussed, systems are defined by the interactions that occur within them (Berryman, 1981). Therefore, when the focus of a change effort is a social system (e.g., a school, an organization, a community), attention to the presence, absence, and nature of social relationships among system members is particularly critical to understanding system functioning. Indeed, researchers across a variety of fields have well-documented how poor relationships across critical stakeholders have impeded systems change efforts. For example, in the field of domestic violence, the presence of historically uncooperative and often adversarial relationships between key organizational stakeholders such as victim service providers, law enforcement agencies, and courts has been recognized as a significant barrier to a community's ability to create a coordinated community response to domestic violence (Pence & Shepard, 1999). As a result, many efforts to strengthen community systems around domestic violence response have explicitly worked to improve these relationships in order to increase interorganizational collaboration and coordination (Hart, 1995; Gamache & Asmus, 1999). Similarly, in the field of community development, turf issues among local service providers and a lack of positive relationships among and between neighborhood residents and local organizations have commonly been identified as barriers to neighborhood revitalization (Walsh, 1998). As such, most community building initiatives pay substantial attention to coalition building among community stakeholders and promoting the development of social capital in distressed neighborhoods (e.g., Hyman, 2002).

Relationships play facilitating and constraining roles in systems in multiple ways. They provide the vehicle for information and resources to diffuse through the system (Bailey & Koney, 2000; Frank & Zhao, 2004); they support the development and transfer of norms, values, beliefs and attitudes (Coleman, 1988; Putnam 2000); they provide a mechanism for system members to access opportunities (Burt, 2000). It is, therefore, vital that change agents understand both how relationships are structured currently within the targeted system and what types of relationships will be required to bring about desired changes.

Economics and opportunities Economic and opportunity capital refers to the configuration and distribution of financial and programmatic/organizational resources within a system. A simple examination of what economic resources and opportunities are available and how they are allocated can shed significant insights into what and who is valued within a system. For example, a comparison of the funds available for treatment or remedial programming (e.g., criminal justice or incarceration programs) relative to

more prevention-oriented programming (e.g., diversion programs for juvenile delinquents) illustrates what types of human services are perceived to be of highest priority in the United States. Thus, one task in understanding if the resource context is compatible with a systems change pursuit is to examine the extent to which current resource distributions (such as school or human services funds) and opportunity configurations (such as program and job locations) reflect and support the desired goals or outcomes of a systems change effort. In addition, it is important to note that the provision of economic resources alone is often insufficient for systems change efforts to succeed when the increase in resource availability is intended to leverage change in the behavior of system members. For example, Johnson & Rusch (1994) and Phelps & Wermuth (1992) found that in order for systems change efforts in the disabilities arena to be successful, the new resources needed to be coupled with training and technical assistance to help system members adopt the new service philosophies and practices.

Case example In its effort to build resident power, our CCI's designers created a neighborhood mini-grant program where residents could apply for small grants to improve neighborhood conditions with their neighbors. This program was intended to provide residents with access to resources and power over program design in ways that had not happened before in this community. It was also intended to provide on-the-ground opportunities for residents to build their capacities to engage in larger scale change efforts. While the mini-grant program has been successful on many dimensions, it began to engage fewer and fewer residents over time. Analysis of program applications and interviews with residents revealed that the decline in resident involvement was partly due to the loss of technical assistance (TA) that was initially provided to residents. After this TA support was removed, only residents who had the capacity to participate (due to their leadership status in the neighborhoods) pursued mini-grants. This insight has led the CCI designers to consider alternative ways to support residents in this program.

System regulations: policies, procedures, and routines

To function effectively, systems need members and settings to act in a coordinated manner aligned with the overall system purpose or goal. To ensure this alignment, systems work to regulate the behavior of their members in a variety of ways. Governmental (local, state, and federal) and organizational policies often have the most sustained and far-reaching impact since they clarify what is normative and expected, sanctioned or rewarded. However, the

power of any specific policy is dependent upon the degree to which it is complied with across system levels. Compliance rates vary greatly across states, communities, organizations, and individuals (e.g., Paulozzi, Spengler, & Gower, 1992). This compliance is often related to the perceived value or popularity of a particular policy (e.g., Adeyanju, 1991) or to the degree to which other elements within the system such as resource supports are congruent with this policy change (Foster-Fishman & Keys, 1997). For these reasons, developing broad support for specific policy changes and aligning system resources to support adopted policies is critical to the institutionalization of a desired change (e.g., Freestone et al., 2001).

Because policies, by themselves, do not clarify how system members should shift their behaviors and practices to support a change, it is necessary to create corresponding changes in system routines. Routines emerge from long-standing formal and informal protocols and procedures that guide, maintain, and constrain the behavior of system members (Olson & Eoyang, 2001, Yin, 1978). Some systems theorists argue that these regulations are so important to system functioning that the success of a systems change endeavor rests on the extent to which the routines, protocols, and procedures are/become compatible with the targeted change (e.g., Meadows, 1999). As the case example illustrates below, system regulations that indicate what will be rewarded/punished are viewed as particularly powerful regulatory mechanisms and should be given careful consideration during a systems change endeavor.

Case example In our disabilities example, the new federal policy that required consumer empowerment created great tensions for the rehabilitation counselors who were evaluated on how many of their clients became employed. Simply put, the process of having clients consider options and control the vocational planning process took more time than having counselors make these decisions. As a result, the procedures in place for evaluating and rewarding employees were incompatible with the new behaviors required by this policy and, subsequently, many counselors resisted this shift.

System operations: power and decision-making

Systems require multiple operations to enact their purpose, including processes for moving products or people through a system, for communicating information across system members, and for making decisions and determining how and where power is held. While many different operations can be targeted in systems change efforts, power and decision-making processes are emphasized in our framework. How power is enacted within a system is both

symbolic of and a manifestation of the status quo; attention to power creates another opportunity to target root causes of problematic behavior.

It is common for systems change efforts in the human services and community building arena to directly challenge or target existing power and decision-making structures based on the perspective that “top-down” “expert-driven” models of decision-making and service delivery reinforce a climate of dependency and hinder the development of individual, collective, and community efficacy (e.g., Kingsley, McNeely, & Gibson, 1997; Smock, 1997). For example, reforms in the mental health system have worked to empower consumers of services with the authority to determine the form and function of the services they receive (Corrigan & Boyle, 2003). Similarly, many proponents of CCIs have attempted to shift the power structures within their targeted community systems by reorganizing decision-making mechanisms to provide greater opportunity for residents to have control over the design and implementation of activities (e.g., Chaskin, 2000; Smock, 1997). Evaluations of some of these efforts have found that when other system parts are not aligned with the new power structures, significant challenges surface. For example, in some communities residents did not realize real power and authority over the systems change efforts because organizations still retained ultimate control over program implementation (e.g., Auspos, Brown, & Hirota, 2000).

How does one identify the power structures of a system? This can be a complex undertaking since there are many bases of power within any system. Power can be based upon formal authority given to individuals or groups through the policies, procedures, and practices within the system. Substantial power and influence can also rest in other sources such as an individual’s or group’s reputation, their ability to control information or other resources, their relationships with others in the system, and/or their ability to sanction or reward others (Raven, 1993). Overall, an examination of power within a system focuses on influence—specifically, who and what influences how resources are distributed, how actions are carried out, and how decisions are made. It also includes an investigation of how individuals and groups gain and leverage the power they hold.

Case example In our disabilities services example, an explicit shift in power and decision-making control was desired: clients were now expected to have control over their rehabilitation plans and processes. While counselors worked with clients in one-on-one sessions to identify their needs and goals, other elements in the rehabilitation system did not shift to support client control. For example,

resources to support employment were still controlled by the counselors who ultimately controlled which clients received what resources. So, while clients had a voice in their employment planning process, the final say in how they would transition back to employment and what the programs resources would actually support still rested with the professional staff.

Assessing interactions in systems

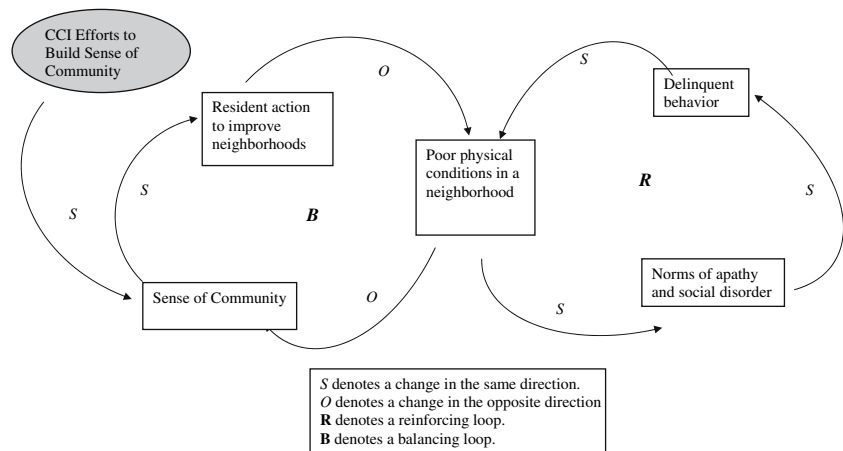
Above we described fundamental systems parts along with some examples of how they may interact within a system to facilitate, moderate, or impede change efforts. What remains in our approach to systems change is an integration of these elements into a holistic picture of the targeted system so that targeted changes can be understood from a systemic perspective. Systems thinking reminds us that all system parts are either directly or indirectly connected to each other and the outcomes of systems are the product of these interactions (Kim, 1999; Maani & Cavana, 2000). This basic tenet of systems science has several important implications for what it means to adopt a systems approach to understanding systems change. Specifically, it suggests that no part of a system can ever be fully understood divorced from its interactions with other system elements. It also suggests that the interactions within the system, including their character and consequences, must be examined to fully understand how and why a system functions as it does (Senge, 1990). The third step in our framework—assessing system interdependencies—was designed with these considerations in mind. We describe below several characteristics and consequences of interactions that systems change agents and researchers can use as tools for thinking systemically about systems change. As we stated above, system stakeholders should be engaged in assessing these interactions given the likelihood that they will have different understandings of these dynamics.

Interaction characteristics

Essentially all systems, no matter how complex, are made up of two patterns of interactions: balancing and reinforcing feedback loops (Kim, 1999; Senge, 1990). These interactions provide information to the system, serving to either escalate or stifle system behavior (Senge, 1990). In a reinforcing interaction, system components interact with one another in a manner that leads to an ever-increasing escalation of a given outcome, thus creating either a virtuous or vicious cycle. Take for example one reinforcing interdependency that is commonly seen within neighborhood systems. According to broken windows theory (Skogan, 1990), minor neighborhood blemishes (e.g., broken windows) that go unattended convey apathy and social disorder that invite—or at a minimum communicate lack of resistance to—further delinquent behavior. Thus neighborhood norms, physical conditions, and local operations are premised to exist in a reinforcing interdependent relationship with one another explaining how neighborhoods can fall into a pattern of escalating decay in the absence of any community intervention (Fig. 4).

Given this, CCIs like the one described in this paper, often design interventions to counterbalance this reinforcing cycle of decay. These interventions are often based upon psychological sense of community theory (e.g., McMillan & Chavis, 1986) which posits a balancing interdependency into this dynamic such that when neighborhoods have relational resources (neighbors feel connected to each other and the group), residents will seek to intervene in their neighborhoods when evidence of decline becomes apparent, thereby limiting the pattern of deterioration (see Fig. 4). Balancing interdependencies are then a pattern of interactions in which system parts serve to stabilize the influence of one another, creating stability or stagnation in the system.

Fig. 4 An example of balancing and reinforcing loops



Attention to balancing and reinforcing interdependencies can shed light on the patterns of system behavior because these patterns are constrained and maintained within these interactions (Olson & Eoyang, 2001). For example, our disabilities service organization had a long standing pattern of failed change efforts. Thus, employees had a strong cultural belief that “change never happens around here.” This belief fueled their resistance to the new mandated changes. This resistance in turn, contributed to the ultimate failure of this new initiative. In other words, the reemergence of this pattern provided feedback into the system that further reinforced the belief that change never happens.

However, in many cases, information feeding back into the system is vital for the system to self-regulate or improve. For example, in our CCI, one source of feedback that was missing was communication from residents to the city about the state of abandoned buildings in their neighborhood and the fact that many landlords were not complying with city code. Without a mechanism for communicating the level of code violations, the frequency of violations continued to escalate. Once this feedback loop was created, the city commissioners increased their monitoring and enforcement of code compliance within these neighborhoods. As this illustrates, attention to how systems can improve their self-regulation through developing better feedback systems can be a powerful lever for change (Meadows, 1999).

Interaction delays

One characteristic that can be present within both balancing and reinforcing interdependencies—and have significant implications for systems change efforts—is a delay (e.g., Meadows, 1999). Delays refer to a time lag that exists within an interaction between two system parts: a shift in one part has a delayed impact on another system part. This delay can often make a systems change effort look or be unsuccessful. Take for example, our CCI, where an increase in neighborhood leadership may take several years to lead to a real shift in system regulations such as city policies because it may take time for leaders to build their organizing efforts and exert power on city policy makers. If left unnoticed, delays can result in failed systems change efforts because systems parts or interactions are targeted that are ill equipped to produce the desired change within an allocated time frame or funding period. Delays are often problematic for systems change efforts because they are often not easy to alter and sometimes difficult to detect (Meadows, 1999). However, by proactively working to identify delays in interactions prior to initiating a systems change effort, initiative designers can potentially mitigate their impact by leveraging change in other relevant system parts or by building other system connections.

Collectively, patterns of balancing and reinforcing interdependencies and the delays within them determine the outcomes and outputs of a system including its overall health and stability, what it is able to produce or accomplish, and the extent to which it is able to position itself to learn from past experience and take advantage of future opportunities.³ Thus, the challenge facing systems change practitioners and researchers is to understand the complexity of these interactions, the time intervals it takes to shift them, and the implications these have for the targeted systems change goal. Tools such as closed-loop modeling (e.g., Anderson & Johnson, 1997; Senge, 1990) provide one means for identifying and visually displaying these interdependencies. Overall, by focusing on shifting system interactions, system change efforts make the system the focus of change and are thus more likely to identify and target the underlying processes that comprise the fundamental causes of the targeted problem (Senge, 1990).

Leveraging systems change

Once systems change agents and researchers have developed a comprehensive understanding of a system’s deep and apparent parts and their interactions, they are well positioned to locate strategic levers for facilitating systems change. We offer the following diagnostic questions to assist researchers and practitioners in the process of identifying both fundamental system parts and system interactions that can serve as these strategic leverage points.

Questions for identifying levers for change in system parts

When using system parts to leverage change, systems change agents can: (a) shift fundamental parts to make them more consistent with the systems change goal; and/or (b) strengthen the systemic influence of fundamental parts that are already aligned with the targeted outcomes. In either case, systems change depends upon the ability of the targeted fundamental part to trigger change throughout the system via its interactions and interdependencies with other system elements. The following questions were designed to help systems change strategists identify strategic parts to leverage for change.

- (1) *Which system parts are currently inconsistent with the systems change goal? Which parts support the systems change goal?* This includes parts that (a) are

³ For a review and discussion of frequently occurring patterns within system interdependencies, their implications for system functioning, and techniques for mapping these relationships through causal loop diagrams see <http://www.systems-thinking.org/arch/arch.htm> or Kim & Anderson, 1998.

problematic in that they cause disruptions in system functioning; (b) have characteristics that are misaligned with the overall purpose of the change effort; and/or (c) are aligned with the systems change goals.

- (2) *Which parts are most likely to trigger system wide change?* System wide change occurs when levers can instigate needed changes across the system. This requires system parts that are either powerful enough and/or connected enough within the system to leverage systemic change. For example, Meadows (1999) proposes that systems change is most likely to occur when change is leveraged in a system's norms and/or regulations because these parts exert strong influence on system behavior. System parts that have multiple, direct cross-level or cross-subsystem connections are also valuable levers for change because they have the potential to radiate change in multiple system sectors simultaneously. Overall, this suggests that systems change agents should pay particular attention to/create system norms and regulations that exert strong influences on system behavior *and* have the linkages to create cross-level or cross-setting changes within the system.
- (3) *Which of the above desired levers for change can actually be altered or strengthened given current resources and understandings?* In other words, what do change agents—in their position and with the available resources—have the ability to influence? Which parts are malleable within the system? Sometimes change agents are not able to exert direct influence on a desired lever for change but instead can leverage change further “upstream” with the hope that system interactions will lead to the intended shifts. Of course, this indirect strategy is sometimes less than effective, given interaction delays and the unintended consequences of change.
- (4) *What impact will the shift in the targeted system parts have on other system parts, interactions and the problem situation?* Even if powerful levers for change are identified, systems change strategists should assess if the change in the targeted system part will lead to the desired outcome. This requires an understanding of how the system will respond to the shift in the targeted part. It includes attention to balancing and reinforcing feedback loops, delays in these interactions, and potential unintended consequences of change.

Questions for identifying levers for change in system patterns and interactions

Patterns and interactions within systems can also serve as powerful levers for change, particularly when they are

adjusted—or created—to foster learning and self-improvement within a system (Olson & Eoyang, 2001). The following questions were designed to help change strategists identify which interactions and patterns to leverage for change.

- (1) *What differences within the system could serve as leverage points for change?* In our disabilities example, local rehabilitation offices varied greatly in their normative culture. Some had leaders and staff who held beliefs and practices that were very supportive of the move to client empowerment; other sites did not. Because the connections between the offices and between the offices and the administrative headquarters were relatively weak, these differences created both opportunities and obstacles for the targeted systems change to occur. Thus, where local sites had deep and apparent parts compatible with the change, some of the policy changes were implemented; where site cultures were incompatible, great resistance emerged. Attention to differences allowed change agents in this effort to identify where systems changes may take hold and where they would fail.
- (2) *What enduring patterns within the system will likely impede change or the targeted systems change goal?* As we described, our disability services system had a long standing pattern of “things never changing.” Although this service system was often the target of new federal and state policies, these policies often did not result in real shifts in system operations or practices. Using the framework we presented above, we were able to understand this pattern by identifying weak or significant delays in interactions between fundamental system parts (e.g., changes in state or federal policy took years to create real changes in employee practices due to the bureaucracy and the ability of other patterns of behavior to resist change). This highlighted the need to better understand why this linkage was weak or delayed, what could be done to strengthen this linkage, and what other systems parts could be altered that influenced procedures and practices.
- (3) *What linkages between system parts could be created or altered to align system functioning with the system change goals?* Are there places where connections are absent or weak and are needed? Are there interaction delays that could impede change efforts? If so, could any of these be circumvented through the purposeful use of other interaction pathways or the construction of alternative linkages? Finally, are there any missing feedback loops within the system? How might the system more effectively seek and integrate feedback?

Conclusion

We have argued that one of the challenges facing both scholars and practitioners interested in system change is the dominance of models for thinking about and carrying out these efforts that are incongruent with contemporary understandings of both systems and change. This paper has sought to address this dilemma by introducing a framework and an approach for conceptualizing systems change in a way that is holistic, focused on second-order change, and accounts for the interdependencies that define complex systems. Based on our framework, we have argued that a systems-based approach to systems change must:

- Recognize the subjective nature of system conceptualizations and engage system stakeholders in an ongoing dialogic process to consider the varied perspectives concerning the problem definitions, system boundaries and characteristics, and system solutions.
- Attend to the normative, resource, regulation and operational characteristics that dictate behavior and lived experiences of system members. Particular attention to the similarities and differences in these characteristics across system levels, niches, and actors can illuminate potential areas of support for—or resistance to—change.
- Result in a sustained shift in the pattern and/or nature of interactions among system parts that ultimately leads to the reduction of the targeted problem.

In conclusion, all change effort are not or nor need to be system change efforts. However, when the nature of the problem being addressed is embedded within dominant system norms, resources, regulations and power operations and their interdependencies, a second order systemic approach to change often becomes necessary. By understanding the deep and apparent structures and their interrelationships within a system, funders and change strategists are more likely to identify system interventions capable of leveraging transformative change. They are also more likely to foresee the possible unintended consequences resulting from planned actions and how these consequences become conditions or opportunities that call for further/different actions. With a more systemic approach to system change, and the documentation of these efforts through rich case-study analysis, the conceptualization, implementation, and evaluation of systems change will begin to reflect the complexity and sophistication this field of study warrants.

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