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Developmental evaluation: Complexity leadership theory in practice-A mixed methods study

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Dedication

This work is dedicated to the many unknown and unrecognized community activists who pursued and will pursue collective efforts to improve living conditions for the underrepresented.

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Abstract

Networks of organizations frequently operate within complex adaptive systems in which leadership is practiced in uncertain and ambiguous conditions. Background in complexity theories is first provided, along with how they apply to organizations operating in complex adaptive systems. A theory—Complexity Leadership Theory (CLT)—has been derived to model leadership in complex adaptive systems; CLT has been tested very little in practice. Developmental Evaluation (DE) is a practice which helps organizations and their networks adapt within complex adaptive systems. Since both processes are based in complexity, leadership characteristics in each can be expected to be similar.

This exploratory mixed methods study incorporates a qualitative study of key informants to explore the leadership characteristics used in the implementation of DE and a quantitative study of participants of DE to support and verify the qualitative findings. A valuable instrument was developed to measure CLT leadership characteristics in DE, which can be used in subsequent research. Factor analyses found DE leadership characteristics were comparable to CLT leadership characteristics, providing an area of study that can improve the theory while making the theoretical approach more relevant to practitioners. Adding to the theory are emergent leadership characteristics which may contribute to the study of CLT. DE benefits from an improved understanding of leadership characteristics in complex adaptive initiatives.

Keywords: leadership, complexity theories, Complexity Leadership Theory, complexity analysis, Developmental Evaluation, complex adaptive system leadership.

Chapter 1: Introduction and Background

Introduction

Nonprofit leadership today is complex, marked by adaptiveness, interdependence, overlap, and co-evolution (Foster, 2005). Nonprofit organizations—and their networks—are often recognized as complex adaptive systems by complexity theorists; leadership within such complex systems differs from leadership in organizations operating under more traditionally-structured models. Complexity Leadership Theory offers a model for organizations to enable adaptive responses to challenges; it offers tools for organizations and subsystems dealing with rapidly changing, complex problems.

Testing leadership in complex adaptive systems quantitatively is difficult, because of multiple variables acting on each other at various times. What CLT has yet to do well is test the theory outside of controlled computer models in the realm of real, complex adaptive systems. This study finds that leadership as modeled in Complexity Leadership Theory is analogous to leadership as practiced in Developmental Evaluation (DE), a process of continuous feedback loops designed to provide collaborators ways to quickly adapt and improve.

Using an exploratory mixed methods approach, I first obtained rich information on the nature of leadership in Developmental Evaluation through qualitative research. Qualitative questions were based on leadership characteristics identified in the Complexity Leadership Theory literature. The second, quantitative strand built on the information learned in the qualitative research by providing measures to verify the leadership characteristics as observed by practitioners of Developmental Evaluation.

The research is guided by the question of whether a correlation between leadership characteristics in Developmental Evaluation and Complexity Leadership Theory exists. If the correlation is sufficiently strong, Developmental Evaluation can be used to measure Complexity Leadership Theory and its applicability to the conditions in which nonprofit organizations operate. A practical measure for Complexity Leadership Theory will help guide the work of nonprofit organizations in complex adaptive systems.

Complex Adaptive Systems

"Complexity theory" is not a unified body of theory (Thrift, 1999). It is a range of scientific theories which stress non-linearity, unpredictability and self-organization in the way systems work—always-changing, unstable and dynamic. There is no consistent relationship between different elements (Ang, 2011) in complex systems. Interactions between systems may produce unpredictable effects leading to massive changes in the future. There is no necessary proportionality, no simple linearity between causes and effects (see, for example, Stengers, 1997; Waldrop, 1992). It is a set of theoretical and conceptual tools developed across a range of disciplines (Capra, 1996; Maturana, 1980; Waldrop 1992).

Complexity avoids the notion of a system made up of its parts and rejects hierarchy, allowing for more than one set of relationships, each set its own system interacting with each other (Walby, 2007). Different disciplines may approach complexity in different ways, but the properties commonly agreed upon include adaptiveness, interdependence, overlap, and coevolution (Foster, 2005).

Since the time of Rene Descartes, scientists of all sorts, including social scientists, have attempted to explain things by analyzing them—taking them apart, studying them,

and calculating how the parts work together. In complexity, the properties of the parts can be understood only from the organization of the whole. Therefore, complexity thinking concentrates not on basic building blocks, but on basic principles of organization (Capra, 1996).

Nonlinear, non-mechanistic complexity thinking has not only become more popular, it is doing so among a diverse set of disciplines: biology, mathematics, physics, chemistry (Capra, 1996), and sociology (Byrne, 1998). James Lovelock (2000) had an illuminating insight that led him to formulate the idea that the planet Earth as a whole is a living, self-organizing system, which he developed into the Gaia theory. In recent years the themes and results of complexity science have touched almost every scientific field, and some areas of study, such as biology, physics, and social sciences, are being profoundly transformed by these ideas (Mitchell, 2009).

Complexity theories, as a general science of wholeness (Byrne, 1998), can help organizations understand and work within complex adaptive systems. Complex adaptive systems are defined by Holland (2006) as systems containing a large number of components or agents that adapt or learn as they interact. An example of complex adaptive systems could include networks of nonprofit organizations or nonprofit, for-profit, and/or public organizations participating in an initiative addressing a particular issue.

Complexity and the Nonprofit Sector

Tasked with the stewardship of public goods or quasi-public goods, nonprofit organizations have a variety of stakeholders to please. Stakeholders have different ideas about the real problem and thus often have different solutions. Achieving goals often

generates new issues, and the problems nonprofits take on require working across sectoral boundaries and across disciplines. Salamon (2012) claims that the sector performs five fundamental functions (service, advocacy, expressive, community building, and value guardian) being reshaped by four impulses (voluntarism, professionalism, civic activism, and commercialism/managerialism). Making sense of all these forces is no easy task.

In a recent INSEAD[1] survey conducted by Ibarra (2015), leaders across sectors listed the most important competencies of their tasks. The top six were: collaboration, inspiration/motivation, getting buy-in, providing strategic direction, decision-making under uncertainty and ambiguity, and influencing without authority. As will be demonstrated later in this document, these are characteristics of operating in a complex adaptive system. The survey results indicate that leaders in complex adaptive systems understand that their roles and their organizations operating within complex adaptive systems are complex, but they may not be adequately learning to adapt to changing circumstances. Many are navigating through their complex environments by learning to partner with others, building alliances, and joining coalitions or collaborations to maintain or increase effectiveness (Boris & Maronick, 2012), increasing the complexity of their environments.

In such networked settings, a new perspective of nonprofit leadership is emerging in circumstances that are too complex to attribute to one single individual, organization, or even to pre-planned strategies. For example, networks created to resolve systemic social issues (e.g., poverty, community development, or global warming responses) may

[1] Not an acronym, and spelled in all capital letters in its literature; INSEAD promotes itself as "The Business School for the World" (INSEAD, 2016)

rotate through leadership in order to effectively adapt to their working environments. Although leadership in complex circumstances may reside within multiple individual leaders, the importance of leadership does not diminish.

Models of leadership in emergent, adaptive organizational systems based on complexity science have been developed and tested using computer simulations (Marion & Uhl-Bien, 2002) or single case studies for one organization using qualitative research (Plowman, Baker, Beck, Kulkarni, Solansky, & Travis, 2007; Plowman, Solansky, Beck, Baker, Kulkarni, & Travis, 2007). Computer simulations are used in an effort to incorporate many variables of leadership in complex circumstances interacting with each other in a myriad of ways. While this simulates many of the intricacies of complex adaptive systems, programming the simulations may not include the temporal aspects of critical variables or properly weight variables with disproportionate influence (Schneider and Somers, 2006). The case studies, based on actual conditions and using qualitative data, are better at considering complexity, but because they study only one organization are not adequate to generalize the diverse circumstances organizations confront. In both cases, the levels of analysis have been limited to an individual leader (micro-level) and the organization (macro-level) and do not study the networks (meta-level) in which the leaders and organizations operate.

Evaluation response to complex adaptive systems. Concurrently, practitioners have been finding their own ways to operate in complex adaptive systems. One method taking hold in some arenas is Developmental Evaluation (DE). The characteristics of DE include adaptability, learning, interdependence and coevolution (Gamble, 2008). These

characteristics are useful in the networks in which nonprofit organizations find themselves working and are strikingly similar to the stated themes of CLT.

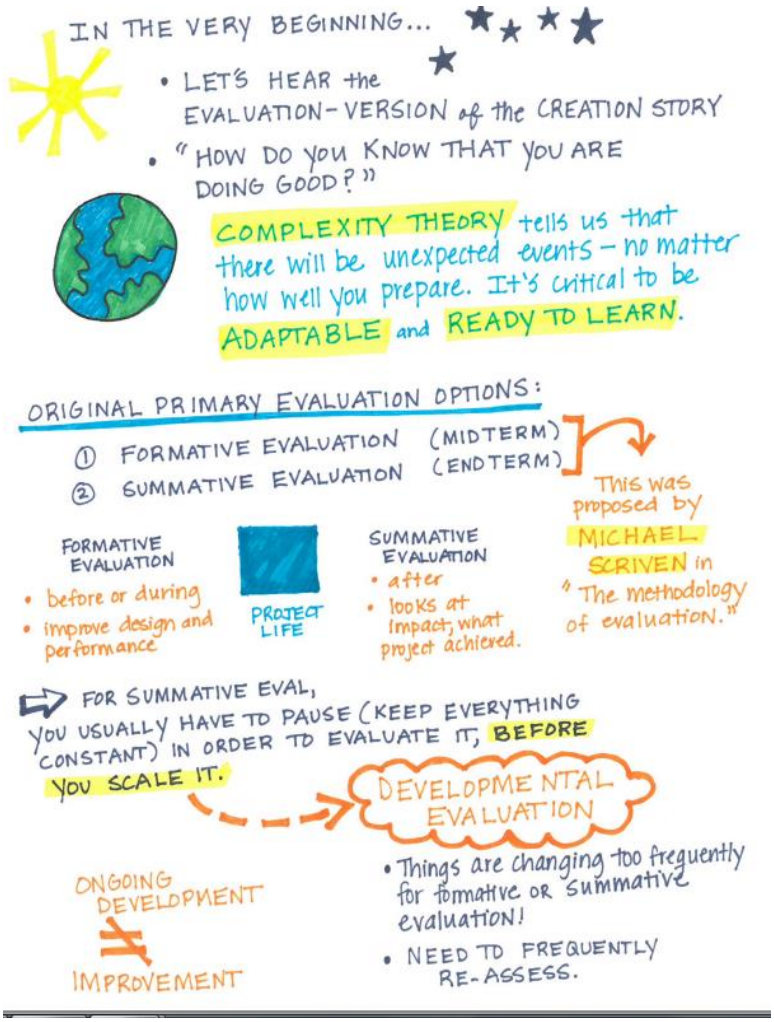
Developmental evaluation[2] is a recent development within the field of evaluation. As a recent development that relies on long-term processes, its measure of success is currently limited to case studies (Patton, 2016).

Patton (2008), who pioneered this form of evaluation, defines it as a collaborative, interactive, and long-term process between evaluators and those engaged in initiatives. Developmental evaluation processes include asking evaluative questions and gathering information to provide feedback and support developmental decision-making and course corrections along an emergent strategic path. The evaluator (DE coach) is part of a team whose members collaborate to conceptualize, design, and test new approaches in a long-term, on-going process of continuous improvement, adaptation, and intentional change. The evaluator's primary function in the team is to elucidate team discussions with evaluative questions, data and logic, and to facilitate data-based assessments and decision-making in the unfolding and developmental processes of innovation. The collaborative evaluative judgements are ongoing and timely; DE involves evaluative thinking throughout an initiative's development and implementation, not solely formatively or summatively.

[2] The medical field uses the term "developmental evaluation" to refer to assessing individual human development. The use of the term in the context of this paper is of evaluation of organizational efforts. The term should also not be confused with "development evaluation," used frequently in the context of assessing international aid development programs.

Gamble (2008) explains that developmental evaluation applies to ongoing innovation in which both the process and the goals are evolving. Approaches such as formative and summative evaluation focus on measurement of intended outcomes; formative evaluation is an effort usually prior to the beginning of a program to improve how the program will be delivered, and summative evaluation measures outcomes and impacts after completion of a program or a stage of the program (Newcomer, Hatry, and Wholey, 2010). Developmental evaluation is utilized to support innovation within a context of uncertainty, in which the process and outcomes are evolving. The term "developmental" in developmental evaluation describes innovation driving change. This differs from making improvements to attain a clearly-defined one-time goal. Innovation is typically used to describe the introduction of something new and useful. Social change innovation, however, occurs when there is a change in practice, policies, programs or resource flows. Innovation is distinct from improvement in that it causes reorganization at a systems level. Michael Quinn Patton graphically described the relationship between summative, formative, and developmental evaluation (Figure 1), which are not mutually exclusive, in Haugh (2016). Developmental evaluation is useful in highly dynamic environments that change too quickly for formative or summative evaluation to be meaningful. It is also more useful when considering long-term impact.

+Figure 1. *Michael Quinn Patton on Developmental Evaluation for Beginners*



Source: Haugh (2016). *Katherine Haugh's Blog*.

Complexity is a science of the everyday world in which practitioners operate. Regarding DE through the lens of complexity is valuable as a framework for making sense of the environment in which organizations operate and how the environment changes. Complexity helps DE organizations make sense, guide innovation, and adapt (Patton, 2016). The practice of DE emerged from working in complex dynamic environments. Social innovators, as Patton calls those who work on seemingly intractable problems, adapting programs to new contexts, catalyze systems change, and

improvise rapid responses. Gamble (2008) explains DE as evaluation for doing things in situations of high complexity. The field of evaluation "has been dominated by project- and model-testing" (Patton, 2016, p. 19) that has mastered how projects can be evaluated. However, large social problems are interconnected, and require action at a systems level involving multiple projects. While traditional evaluation approaches tend to offer clear, specific, and measurable outcomes that are achieved through processes detailed in linear logical models, such demands for pre-planned specificity do not work well in conditions of high uncertainty, turbulence, and emergence. Ongoing, interactive evaluation is more useful in social systems that are inherently dynamic and complex. Observations are needed from multiple perspectives—participation and collaboration, what is being done and what the environment is doing (Patton, 2016).

By focusing on adaptive learning (Patton, 2011), Developmental Evaluation supports innovation. The J. W. McConnell Family Foundation, whose interests are to foster citizen engagement, build resilient communities, and develop potential by contributing to the betterment of communities addressing intractable social problems in Canada, has been training participants of nonprofit organizations in Canada and supporting the networks since the early 2000s (Gamble, 2008). The J. W. McConnell Foundation established Innoweave, a separate but Foundation-funded organization that provides innovative new resources to nonprofit organizations in Canada, including training for Developmental Evaluation coaches (Innoweave, 2016) and a guide to finding DE coaches. Innoweave was created to promote further practice of DE, particularly through the lens of complexity (M. Cabaj personal communication, August 24, 2016).

Purpose of the Study

Exploring the similarities of CLT and DE leadership and identifying their characteristics can help researchers and practitioners understand how leadership at the macro-level (networks of organizations) responds to and navigates in complex adaptive situations.

This study is guided by the question: *Are the leadership characteristics of Developmental Evaluation (DE) similar enough to the leadership characteristics of Complexity Leadership Theory (CLT) to serve as a measure of leadership in complex adaptive systems?* If the characteristics are analogous in Developmental Evaluation and Complexity Leadership Theory, DE may provide a way to test the theory of CLT outside of controlled computer models, in the realm of real, complex adaptive systems. To that end, this research report explores whether leadership as modeled in Complexity Leadership Theory (CLT) is analogous to leadership as practiced in Developmental Evaluation.

This exploratory sequential mixed methods study (Creswell & Clark, 2011) investigates leadership in genuine complex adaptive nonprofit networks. The approach is pragmatic—intended to aid practitioners—and exploratory—uncovering leadership practices in real-world networked, complex adaptive social structures. We can learn from organizations that practice in DE networks what leadership challenges they confront and how they adapt to (or adopt) complexity.

The literature on DE tends to focus on what DE is (how to practice it) and the characteristics of effective coaches (evaluators). While DE coaches may occasionally take leadership roles as they help an organization or network move through the process,

because it is common to switch roles in complex adaptive systems such as DE, the coaches themselves do not encourage their remaining in those roles for long. Therefore, unlike the CLT literature, the DE literature, focused as it is on coaching, does not explore leadership characteristics. The first step in comparing the leadership characteristics of DE with those of CLT, then, is to identify the DE leadership characteristics. The qualitative strand of this study asks: *What leadership characteristics are necessary to lead nonprofit organizations through complex adaptive systems?* It explores this question using semi-structured interviews of key informants—DE coaches. The interview questions were derived from CLT leadership characteristics.

The quantitative strand builds on the qualitative strand by hypothesizing that the leadership characteristics identified by the DE coaches emerge in practice: *Are the leadership characteristics expressed by the DE coaches an accurate depiction of DE leadership in practice?* The quantitative phase of the study surveys DE practitioners for observations of leadership characteristics based on the qualitative strand findings. The DE leadership characteristics identified in the qualitative strand were used to identify factors that guided questions in the quantitative strand, using factor analysis. This approach tested the findings from the qualitative strand.

The measure of leadership in DE is strengthened through greater knowledge of leadership characteristics identified by practitioners. A strong correlation in leadership characteristics between CLT theory and DE means the experiences of organizations using DE can be used to test CLT, which, as noted above, has not been satisfactorily tested in the field.

Chapter 2: Literature Review, Theoretical Background, and Research Question

Exploring leadership within complex adaptive systems begins with an exploration into complexity theories. After briefly explaining complexity theories—how they view systems from an additive perspective that differs from reducing systems in order to understand them better—the literature regarding organizations and networks of organizations as living social systems is considered. Finally, I will consider how operationalizing leadership within complex adaptive systems differs from that in less systemic models. While the literature regarding complexity abounds across disciplines, studying leadership within complex adaptive systems is a recent phenomenon with more limited research, most of which applies to for-profit organizational structures. However, some practical methods, and specifically Developmental Evaluation, may add an understanding of how leadership is practiced in complex adaptive systems.

Theoretical perspectives are frequently limited in their ability to explain complex adaptive systems. In some disciplines there is a growing recognition of the need to study operating within complex adaptive systems. As physicist Margaret Wertheim (2013) stated, "We did find out most of the simple stuff, and what we were left with was the hard stuff that is really complex."

Social Structures as Complex Systems

In complexity, randomness is balanced with determinism; self-regulation in complex living systems continually adjusts probabilities of where the system should move, what actions members should take, and, as a result, how deeply to explore particular pathways within networks (Mitchell, 2009). When strategizing, we are not

limited to one direction; as Schwartz (1991) indicates; the fringe can be an important signal of the future, but driving forces are still critical.

Many, if not all, complex systems have what Mitchell (2009) calls a fine-grained architecture, meaning that they consist of large numbers of relatively simple elements that work together in a highly parallel fashion. There are several possible advantages to this type of architecture, including robustness, efficiency, and sustainability.

A fine-grained parallel system is able to carry out what John Rehling and Douglas Hofstadter (1997) called a parallel terraced scan. This terminology refers to a simultaneous exploration of many possibilities or pathways, in which the resources given to each exploration at a given time depend on the perceived success of that exploration at that time. The search is parallel in that many different possibilities are explored simultaneously, but is terraced because not all possibilities are explored at the same speed or to the same depth. Information is used as it is gained to continually reassess what is important to explore.

Mitchell (2009) further explains that this fine-grained nature of complex systems not only allows many different paths to be explored, but it also allows the system to continually change its exploration paths when resources dry up on previously productive paths. As in all living systems, maintaining a correct balance between these two modes of exploring is essential. In fact, the optimal balance shifts over time, indicating a need for continual, rather than static planning and the need to not commit all resources into one strategy. Early explorations, based on little or no information, are largely random and unfocused. As information is obtained and acted upon, exploration gradually becomes more deterministic and focused in response to what has been observed in the

environment. In short, the system both explores to obtain information and exploits that information to successfully adapt. This constant cycle of exploration and adaptation in living systems arises from life's inherent tendency to create novelty (Capra, 1996). This tendency demands constant reviewing and reassessing to remain sustainable.

Four key approaches to complexity can currently be found in the science of living social science (Hatt, 2008):

1) The natural scientific approach that uses mathematics as the ideal language of science (Back, 1997; Kauffman, 1993; Saperstein, 1997);
2) An ecosystems approach that stresses self-organization, unpredictability, and ecosystem intersection with social systems (Holling, 1986, 1994; Kay & Regier, 2000; Kay & Schneider, 1994; Prigogine, 1980; Prigogine & Stengers, 1984);
3) Poststructuralist views of complexity and science as part of a larger sociocultural project (Bainbridge, 1997; Porush, 1991; Stewart, 2001; Wynne, 2005);
4) Social scientific efforts to reform conventional linear-based practices (Bjerg, 2006; Byrne, 1998, 2005; Cilliers, 1998, 2005; Luhmann, 1989, 1995).

Ang (2011) argues that in a rapidly changing and highly competitive global marketplace organizations can no longer depend on a rigid command-and-control style of management, but need to embrace complexity as an organizational tool. The challenge is to find a straightforward analytical framework in which to explain complexity in a way that is not so general as to be of no value and not so theoretical that it loses connection with applicability (Foster, 2005).

Gregory Bateson (1972), a pioneer of systems thinking, emphasized that systems exist not only in individual organisms and ecosystems, but also in social systems.

Bateson thought of systems in terms of environments. In order to describe nature accurately one should try to speak nature's language, which, he insisted, is a language of relationships. Relationships, according to Bateson, are the essence of the living world, and a network of human relationships can be defined as a living social system. This school of thought was expanded in Germany by Niklas Luhmann (1995), who developed the concept of social living systems in detail. Luhmann's central point is to identify the social processes of the living system network as processes of communications. Since these processes take place in a symbolic social domain, the boundary cannot be a physical boundary; it is a boundary of expectations, confidentiality, loyalty, and so on. The roles and boundaries are continually maintained and renegotiated by the living system network of conversations. Its continuing adaptation, learning, and development are key characteristics of the behavior of living systems. Creativity—the generation of configurations that are constantly new—is a key property of all living systems (Luhmann, 1995).

Humberto Maturana (2002) explained that a central characteristic of a living system is that it undergoes constant structural changes while preserving its weblike pattern of organization. The components of the network continually produce and transform one another, and they do so in two distinct ways. One type of structural change is change in which new structures are created—new connections in the living system network. These changes—developmental, not cyclical—also take place continually, either because of environmental influences or as a result of the system's internal dynamics. A living system interacts with its environment through "structural coupling" (Capra, 1996, p. 219), that is, through frequent interactions, each of which triggers

structural changes within the system. Structural coupling establishes a clear difference between the ways living and nonliving systems interact with their environments because a structurally coupled system is a learning system. Senge (2006) labels structural coupling as a continual organizational learning process.

Within the learning process, each member of a community plays an important role. In human organizations, we can view this as partnerships between people with expertise or unique knowledge (Senge, 2006). Combining the principle of partnership with the dynamic of change and development, we may use the term "coevolution," or as Senge (2006) might refer to it, collective learning: as a partnership proceeds, each partner better understands the needs of the other. In a true, committed partnership both partners learn and change—they coevolve (Janzen, 1980).

Acknowledging interdependence is required to function in a complex system, and networking is an indication of interdependence. Networking in social systems has become easier with the advent of electronic communication (Fulk & DeSanctis, 1995). In organizations, listening to the concerns of constituents and other stakeholders is not only easier, the response can be quicker, whether response is in word or deed. In fact, many stakeholders expect leaders to listen, to consider, and to respond appropriately. They expect that they are part of the process, part of the living system.

Interdependence is the first of a set of principles based on the understanding of ecosystems as living networks (Bateson, 1972). The success of the whole community depends on the success of its individual members, while the success of each member depends on the success of the community as a whole. This cooperation entails continual response to coevolutionary partners in a living system, even if the response does not

immediately demand or change in a component of that system. It means continually reassessing through the recognition of patterns, not attempting control through predictability.

Luhmann (1985, 1990, 1995, 2000) blended functionalism and phenomenology with the early insights of complexity theory (Knodt, 1995), challenging the simpler versions of the critique of functionalism. However, the range of complexity concepts that Luhmann introduces is quite small. More promising is the range of attempts to take a Marxist- (or Weberian-) inspired sociological perspective and adjust it for complexity theory (Byrne, 1998; Cudworth, 2005; Jessop, 2002; Urry, 2003). Marxism is, in many ways, more open to complexity because of its efforts to theorize the sudden ruptures of political upheavals and interest in dynamic systems distant from equilibrium (Harvey & Reed, 1994; Urry, 2003). Although these writers share an interest in social inequality and injustice, they still do not address the complex issue of the intersection of multiple social inequalities (Walby, 2007).

In particular, Byrne (1998) noted that complexity provides a way of reviving a systems approach in the social sciences that overcomes the problems of symmetrical models. Systems theory and complexity theories are both interdisciplinary, however in systems theory one looks for patterns, such as fractals, the interaction of parts, and feedback. These features can be found in complexity theories as well, but unlike in complexity, systems remain stable through self-regulation.

Patton (2016) views systems thinking and complexity theory as distinct but overlapping. Thinking systemically means understanding interrelationships and engaging with multiple perspectives. He argues that social innovators are motivated to change

dysfunctional systems and do not limit their efforts to effective projects and programs. Complexity theory, meanwhile, directs attention to the attributes—such as emergence, nonlinearity, dynamic change, and adaptability or coevolution—of dynamic systems change in which innovation blossoms.

While the differences between the various interpretations of complexity theory in social systems may be significant (Medd, 2001), the apparent differences between the leading thoughts of complexity with regard to the social sciences—the Santa Fe and Prigogine (Prigogine, 1980; Prigogine & Stengers, 1984) schools of thought—should not be overstated. For example, the Santa Fe research center is seen as more concerned with mathematically modelling the inner structure of systems. It has placed a high priority on finding order where others thought there was randomness, developing a highly sophisticated mathematics through new computing power. These mathematics are the foundation of the Santa Fe school's commitment to an improved knowledge of patterns. The Prigogine-influenced school of thought focuses on the external relations of systems. Its emphasis is on chaos theory, the discovery of order within chaos, embracing the element of the unknowable. A small event may tip the balance in a system, leading to a new path of development; in mathematical terms, this means a non-linear relationship and a much more complicated analysis (Walby, 2007). Yet these efforts may be considered more complementary than oppositional (Harvey, 2001). Both internal (mathematical) and external factors influence complex adaptive systems.

These interpretations of complexity explain the environment in which organizations operate. Social structures can be regarded as complex adaptive systems, but this does not explain how to lead within complex adaptive systems. Indeed, the

natural scientific and mathematical study of complexity need not incorporate leadership in complexity studies because if leadership exists in these fields it tends to be exceptionally dynamic (Marion & Uhl-Bien, 2002)

Leadership in Complex Adaptive Systems

The rich literature of complexity theories and complex adaptive systems[3] rests primarily in the natural sciences and is difficult to relate to social systems and organizations. The connection to leadership in living social systems, such as networks of organizations that address complex issues requiring partners across sectors, is relatively recent. For example, adaptive leadership has been studied in Hersey & Blanchard's (1969) situational leadership, Greenleaf's (1977) servant leadership, Mintzberg's (1983) shared leadership approach, and Heifetz and Laurie's (1997) adaptive leadership. These theories, however, do not incorporate the complexity characteristic of coevolution—the state of being affected by an environment while simultaneously transforming it. It is even more recently that a theory of leadership in complexity has been developed.

Complex issues such as intractable, interconnected problems need complex approaches that accept, even embrace, ambiguity and the four fundamental components of complexity: adaptiveness, overlap, interdependence and co-evolution. Complexity theories can help organizations understand and work with complex issues, but that means a new way of thinking, and this affects how organizations are led.

Complexity leadership concerns leadership in any form of organization, including applicability to nonprofit organization leadership. It may apply to complex situations or in complex adaptive systems. Lichtenstein, Uhl-Bien, Marion, Seers, Orton, and

[3] For more, see the references in Capra (1996) and Mitchell (2009)

Schreiber (2006) present a theoretical explanation of complexity leadership theory (CLT) as a means of analyzing episodes of leadership, which they define as interactions between actors. They used system dynamics modeling, discrete event simulation, agent-based modeling, and network modeling to explore nonlinear relationships, focusing on their dynamics and interdependence. Lichtenstein et al. (2006) also suggest using non-simulation methods and include longitudinal analyses of critical events in their study of CLT. While these methods are hypothesized to respond to complex adaptive systems, the longitudinal components of these methods may make them inaccessible to many researchers. In addition, Lichtenstein, et al. (2006) do not test their hypotheses.

Other studies related to leadership in complex adaptive systems include the case studies of Plowman, Solansky, Beck, Baker, Kulkarni, & Travis (2007) and Plowman, Baker, Beck, Kulkarni, Solansky, & Travis (2007). These two linked studies used a qualitative approach to observe the complex interactions and behaviors that characterize leadership in CLT. The studies focused on reviewing the decision-making processes at a local organization during a period of dramatic change. Findings from these studies suggest that leadership is one of several factors contributing to the radical and unintended organizational transformation of the organization "from a dying church with nothing unique about it to one that people throughout the city came to recognize for its ministry with the city's homeless" (Plowman, Solansky, Beck, Baker, Kulkarni, & Travis, 2007, p. 344). Leaders applying complexity are characterized by their ability to 1) disrupt existing patterns, 2) encourage novelty, and 3) use sensemaking (Plowman, Baker, Beck, Kulkarni, Solansky, & Travis, 2007; Plowman, Solansky, Beck, Baker, Kulkarni, & Travis, 2007).

Leaders in the Plowman, et al. (2007) studies disrupted existing patterns in organizational behavior by accepting and managing conflicts rather than minimizing conflict and uncertainty (Plowman, Baker, Beck, Kulkarni, Solansky, & Travis, 2007; Plowman, Solansky, Beck, Baker, Kulkarni, & Travis, 2007), the traditional leadership approach. Leaders also disrupted existing patterns by acknowledging and embracing uncertainty, refusing to back away from uncomfortable truths, talking openly about the most serious issues, and challenging institutional taboos. This positive disruption behavior encourages open thinking and provides legitimacy for new ideas and patterns to emerge. Encouraging novelty includes looking for innovation by generating and reinforcing simple rules that focus on principles and generating flexibility in how to go about carrying out the principles. Facilitating interactions increased connections between people and created a richer and more unpredictable dialogue within the organization, contrasting with the traditional leadership model of command-and-control and strict hierarchical reporting. Finally, leaders acted as sensemakers for the organization by interpreting rather than creating change (Plowman, Baker, Beck, Kulkarni, Solansky, & Travis, 2007; Plowman, Solansky, Beck, Baker, Kulkarni, & Travis, 2007).

The two case studies led by Plowman suggest that in any organization, leaders should work to give meaning to what is happening, but especially in complex situations and systems. Leaders direct attention to what is important and what things mean. They also make sense of emergent events through reframing, either in the principles of the organization, or in the context of the hoped-for changes and how important they are. Leaders label behaviors in ways that provide coherence and shared understanding by carefully using language to articulate meanings. The overall conclusion of the Plowman

et al. (2007) studies is that the leaders of the organization play a key role in radical transformation of the organization, not by specifying it or directing it, but by creating the conditions that allow for the emergence of such change. The catalyzation of the emergent relationships results in more effective leadership, according to Marion and Uhl-Bien (2002); leadership relies more on building social capital than on hierarchy and bureaucracy.

The Plowman, Baker, Beck, Kulkarni, Solansky, and Travis (2007) and Plowman, Solansky, Beck, Baker, Kulkarni, and Travis (2007) conclusions agree with those of Marion and Uhl-Bien (2002), who found that leaders are only one element of an interactive network. Leaders who recognize and accept complexity can use networks to enable useful behaviors. They are transformational within organizations in that they create conditions necessary for innovation, not necessarily creating the innovations themselves; they create and cultivate partnerships; they catalyze more than they control.

Uhl-Bien, Marion, and McKelvey (2007) claim the dominant paradigm in conventional leadership theory focuses on how leaders can influence others to align individual preferences with organizational rationalism. Most models are based on seeking stability and avoiding uncertainty through organizational structure and processes that include hierarchy. Uhl-Bien, Marion, and McKelvey (2007) respond by developing a model of leadership grounded in complexity theories. Complexity, they argue, describes the interdependent interactions of agents within complex adaptive systems, agents with the systems, and systems with systems. The behaviors of agents are always understood within the context of complex adaptive systems. This behavior requires new models of leadership, because problem solving in complex systems is performed by

social networks rather than by groups coordinated in hierarchies. Effective leadership in these conditions occurs through indirect mechanisms and interaction. Complexity mechanisms can be described as the dynamic behaviors that occur within a complex adaptive system. They are not so much about structure as about the agency by which an effect is produced. Examination of mechanisms and contexts will help us to understand how and under what conditions certain outcomes occur. Complexity Leadership Theory, derived from this perception of complexity, sets up organizations to enable adaptive responses to challenges through network-based problem solving. It offers tools for organizations and subsystems dealing with rapidly changing, complex problems.

These tools can be broadly categorized as adaptive, administrative, and enabling. Adaptive leadership is the interactions that occur within groups that cannot be attributed to authority. Administrative leadership activity refers to the more formal structures and planning, and focuses on alignment and controls. Enabling leadership works to catalyze the conditions that allow the entanglement of the adaptive and administrative activities (Uhl-Bien, Marion, & McKelvey, 2007).

In a more comprehensive report, Hazy and Uhl-Bien (2012) organize the relationship between complexity and leadership in complex adaptive systems. They masterfully explain complexity theories and how Complexity Leadership Theory connects to and derives from them. Complexity implies ambiguity, as when studying the relationships that catalyze leadership in complex adaptive systems. The authors explore complexity approaches to leadership, finding computer-generated systems dynamics models to predict the unification of Complexity Leadership Theory to bureaucratic and administrative functions.

Using the complex systems agent-based epistemology of system dynamics, Hazy and Uhl-Bien (2012) explain a model of the leadership meta-capability, which they call the leadership and capabilities model (LCM). It performs an iterated operation on the coarse-grained properties within the system that exploits current capabilities, promotes the exploration of new capability creation, and unifies the system to adapt to local and global conditions. It changes the properties or capabilities that have previously emerged by changing rules of interaction among individuals, which, in turn, changes the properties of the system, including its capabilities. Depending on context, the complex systems leadership operation acts on the system to perform three functions. The *convergent* operation adjusts the properties of the system to make them more predictable. Rules are changed (disruption) to dampen deviations by increasing individual productivity and leveraging cooperative activities with technology and other assets. The *generative* operation responds to changing constraints in the environment and promotes exploration, collaboration, creativity and innovation in system properties. If changing constraints on the system suggests that a qualitative change in coarse-grained properties is needed, fine-grained rules of interaction are changed to promote experimentation. The *unifying* operation uses communication and symbolic activities, to more clearly specify acceptable and expected rules for system properties by promoting locally stable collective identities and systems of ethics.

Hazy and Uhl-Bien (2012) then identify the role of information for the first time in the CLT literature. Complex system leadership evolves local rules of interaction to enact this process. As experiments to acquire resources produce information, feedback (under ideal conditions) leads to significant expected value of the resources that could be

discovered. This positive feedback loop is generative of possible future ecological niches for the system. Hazy and Uhl-Bien (2012) explore how constraints to resources impact the role of leadership and how individuals can change the rules of interaction. Hazy and Uhl-Bien (2012) are also the first to suggest adding quantitative methods that are not computer models to constructs, so that they can be validated and relationships between them identified and tested with statistical methods.

CLT links leadership to organizational adaptation in highly emergent and dynamic systems, and networks marked by many interlocking and shifting relationships. It is not useful in all situations; where predictability and straightforward goals and outcomes are needed, utilizing complexity leadership is likely to prove confusing and time-consuming (Patton, 2011). The theory is designed to guide leadership in navigating organizations—and their networks—through adaptation and co-evolution, and managing in environments with much overlap and interdependence. It is useful in initiatives that require frequent reassessment. Most notably perhaps, leadership in complex adaptive systems rests to a greater extent in relationships between people in an organization or network than in a single individual or organization.

Measurement of Complex Adaptive Leadership

Instruments to measure interactions between people are difficult to develop. Marion and Uhl-Bien (2002) suggest three models to resolve the problem of measuring emergent relationships—modeling social dynamics with computer simulations, experimental simulations, or qualitative studies (particularly ethnographic studies). The latter could be used to explore the patterns of changes in aggregations. Of these three models, only qualitative studies could be used to learn more about leadership dynamics in

real-life interactions. However, qualitative studies of CLT are rare and typically not generalizable, and further guidance on the suggested simulations is not offered by Marion and Uhl-Bien in their 2002 work.

Uhl-Bien, Marion, and McKelvey (2007) return to references of computer simulations for testing CLT. However, they develop CLT further by exploring the overlap between administrative, adaptive, and enabling leadership. These three roles effect the interactions that enable (or catalyze) adaptive outcomes.

Both Marion and Uhl-Bien (2002) and Uhl-Bien, Marion, and McKelvey (2007) consider what leadership entails in complex adaptive systems. Since many of the same researchers are among the authors of these reports, it is no surprise that there is agreement about the characteristics of such leadership. Drawing from complexity theories, they developed the Complexity Leadership Theory model, tested through simulations, to find that distributed, disruptive leadership that includes the needs of all (or most) stakeholders is most effective under complex situations.

While computer simulations are capable of running many multiples of models very quickly, they, as Schneider and Somers (2006) note, are better at creating theory rather than testing it. Simulations may ignore small variables that in the real world produce unexpected consequences. Except for the few case studies, which are not generalizable, there are no tests of how CLT models actually perform, in particular within networks of organizations. The use of qualitative and quantitative data will provide a richer explanation of leadership in complex adaptive systems. Mixed methods research can explore the human interaction and emergence, when an appropriate sample of networked organizations working on issues in emergent ways can be found.

Developmental Evaluation

The CLT models describe leadership characteristics, but, except for the case studies by Plowman, Baker, Beck, Kulkarni, Solansky, and Travis (2007) and Plowman, Solansky, Beck, Baker, Kulkarni, and Travis (2007) these characteristics have not been tested in practice. The practice of Developmental Evaluation, on the other hand, has not measured leadership characteristics. Complexity Leadership Theory (CLT) and Developmental Evaluation (DE) are both based in complexity; leadership characteristics in both can reasonably be expected to be similar. If sufficiently similar, DE may hold the key to field testing CLT.

As a recent development, and as one that emphasizes long-term outcomes (Patton, 2016), there is still little literature about DE. Patton (2016) presents results of qualitative studies of DE, while most of the earlier literature explains DE and prepares DE coaches for practice. As more DE initiatives reach maturity, we can expect more case studies to become available; case studies can be incorporated into the learning activities of current and future DE initiatives. In the meantime, the literature intended to assist DE coaches can be utilized to guide research into DE and the leadership characteristics observed to be effective in it.

The field of evaluation "has been dominated by project- and model-testing" (Patton, 2016, p. 19) that has mastered how projects can be evaluated. Gamble (2008) explains DE as evaluation for doing things in situations of high complexity. Dozois, Langlois, and Blanchet-Cohen (2010) and Patton (2011) explain DE as context-specific,

necessary in dynamic conditions in which there is incomplete knowledge, imperfect anticipation of value priorities, and limited information about choices (Simon, 1997).

In terms of CLT leadership, DE coaches look for opportunities for organizational learning, often serving as catalysts (Patton, 2011), but leave the roles of connector, change agent, collaborator, and complexity acceptor to other participants. Few individuals can fill these roles simultaneously, or even every time the roles are needed, so the roles become interchangeable among organizational members. The fine-grained nature of complexity allows individuals to step into roles as needed (Hazy & Uhl-Bien, 2012) and DE encourages this (Patton, 2011) in order to enhance organizational learning.

As Mitchell (2009) explains, there is no central control in complexity. Leadership in complexity involves identifying patterns and nurturing local adaptation and coevolution, and leadership is more likely to rest in interactions than in hierarchies and linearity. In teams in which members collaborate, change occurs where top-down and bottom-up forces intersect (Patton, 2011). It was Mary Parker Follett (1924) who first thought that it sometimes makes more sense to follow the person in a group with the most knowledge about an issue. Multiple leaders can and do emerge over time, based on the changing needs and knowledge needed (Pearce, 1997; Pearce and Sims, 2002).

Developmental evaluation is a participatory process of gathering information to provide feedback to support incremental course corrections along an emergent path that responds to evaluative questions. It involves long-term, partnering relationships between evaluators and social innovators and their networks. The evaluator is actually part of a team whose members collaborate to envision, design, and test new approaches in a long-term, on-going process of continuous adaptation and intentional change. The evaluator's

primary function in the team is to guide team discussions with questions, data, and theories of change, and to facilitate data-based assessments and decision-making in the unfolding and developmental processes of innovation (Patton, 2008).

Thinking systemically is central to DE. Gamble (2008) asserts that an understanding of complexity informs innovation, emergence, uncertainty, dynamics, and the coevolutionary aspects of DE. The innovation and systems thinking that require this new approach to evaluation are components of complexity theories and are the most relevant framework for studying DE.

Research Question

Complexity Leadership Theory holds many similarities to Developmental Evaluation. As noted in the section "Leadership and Complex Adaptive Systems" above, leaders in complex adaptive systems 1) disrupt existing patterns, 2) encourage novelty, and 3) use sensemaking (Plowman, Solansky et al., 2007). They are catalysts for innovation (Marion & Uhl-Bien, 2002; Uhl-Bien, Marion, & McKelvey, 2007). Hazy and Uhl-Bien (2012) identified the primary functions of leadership in complex adaptive systems as convergence (a mutually-agreed-upon direction); the generation of innovative solutions; and unification of information. Effective leaders in complex systems learn to continually adapt using feedback loops rather than guide organizations or networks based on straight-line predictive actions.

Networks employing DE utilize leadership models in complex adaptive systems (Patton, 2011) that align with descriptions of complexity leadership theory. While Patton (2011) does not identify organizational leader characteristics in DE, he, along with

Dozois, Langlois, and Blanchet-Cohen (2010) and Gamble (2008), identifies DE coach characteristics. Table 1 below offers a summary and comparison of the two models, one theoretical, one developed out of practice reducing the characteristics into six CLT dimensions and adding a number of additional prospective characteristics in DE. Many of these characteristics can be found in other leadership theories; indeed, some, characteristics, such as servant leadership (Greenleaf, 1977), are leadership theories in their own right.

This dissertation is driven by the question: *How similar are the practiced leadership characteristics of Developmental Evaluation and the modeled characteristics of complexity leadership theory?* In order to compare the leadership characteristics of CLT with those of DE, the leadership characteristics of DE must first be identified.

Table 1. *CLT Leadership Attributes and Expected DE Leadership Attributes.*

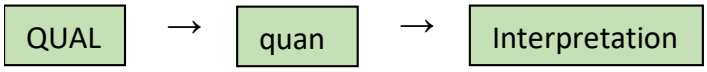
CLT Leadership Attributes	**DE Leadership Attributes**
Connectedness:	
Networked-based problem solving[a]	Community connectedness[f]
Collaboraton[b]	
Catalyze change:	
Interpret rather than create change[c]	Catalyst (coach)[g]
Catalysts are effective leaders[d]	Elucidate and facilitate assessment and
Create transformational change[a]	decision-making[h]
	Relationship building[f g]
	Pattern recognition[f]
	Connector and pattern recognizer[g]
	Partnering relationships[h]
	Familiarity with change[g]
Creativity:	
Encourage innovation[c]	Curious / innovative / willing to test[f]
Exploits innovation[b]	Encourages innovation[g]
Creativity[b]	Continuous adaptation[i]
	Organizational learning[i]
	Continuous improvement and adaptation[h]
Collective identity:	
Distribute or share leadership[e]	Collaborative and sharing leadership[g]
Collective identities[b]	Teaming and collaboration[i]
Comfort with complexity:	
Accept and manage conflict[c]	Comfort with ambiguity[g i]
Recognize and accept complexity[d]	
Acceptance of ambiguity[b]	
Continual learning:	
Employ feedback loops[b]	Process facilitation[g]
	Reliance on feedback loops[h]
	Servant leadership[f]
	Credibility[g]
	Domain expertise[f g]

[a]Uhl-Bien, Marion, & McKelvey (2007)
[b]Hazy & Uhl-Bien (2012)
[c]Plowman, et al. (2007)
[d]Marion & Uhl-Bien (2002)
[e]Lichtenstein, et al. (2008)
[f]Dozois, Langlois, & Blanchet-Cohen (2010)
[g]Gamble (2008)
[h]Patton (2008)
[i]Patton (2011)

Chapter 3: Mixed Method Design and Qualitative Strand

The pragmatic paradigm in research is real-world oriented and practical; data is collected by what works to address the research question (Creswell & Clark, 2011). Operating in the pragmatic paradigm, this study assesses the similarity between the actual leadership characteristics of developmental evaluation and the modeled characteristics of complexity leadership theory. Using an exploratory mixed method consisting of two distinct stands—qualitative followed by quantitative (Creswell & Clark, 2011) —I sought to discover the leadership characteristics that emerge from DE in practice. Qualitative data was first collected from key informants—DE coaches— and used to make decisions about the content in the quantitative data collection method. Quantitative data—from a survey of DE participants—was used to verify the data found in the qualitative strand. The data was interpreted in the framework of CLT.

The mixed methods research can be diagrammed as:



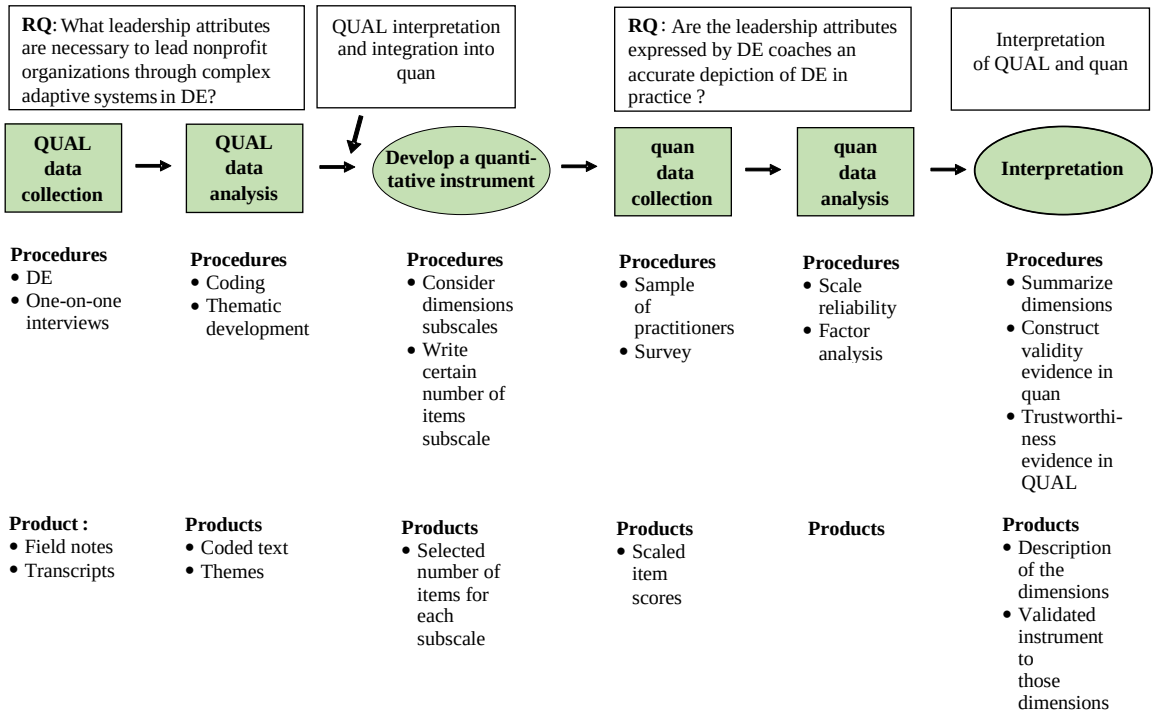
A more detailed diagram (Figure 2 below) explains the procedures and products in each step of both the qualitative and quantitative strands of research. The qualitative data collection procedures[4] of individual semi-structured interviews of DE coaches was based on leadership attributes explored in CLT. I produced field notes and transcripts from the digital recordings of the interviews. Qualitative data analysis included coding and thematic development to produce coded text and notes categorized into themes of leadership characteristics.

[4] Approved by the James Madison University Institutional Review Board, protocol No. 17-0355.

This process was followed by the development of a survey instrument used in the quantitative strand, writing a selected number of items for each dimension found in the qualitative results. The quantitative data collection procedures consisted of developing a sample size of DE practitioners to whom a scaled survey instrument was submitted. Quantitative data analysis consisted of factor analyses on each dimension, producing verification of variables in the qualitative analysis and goodness-of-fit to CLT leadership characteristics.

Procedures for interpretation entailed a summary of the dimensions and evidence of trustworthiness in the qualitative strand and validity in the quantitative strand. The result is a description of the dimensions of leadership characteristics in DE.

Figure 2. *Diagram of Developmental Evaluation Sequential Exploratory Study.*



Qualitative Strand

Qualitative Research Question. The qualitative strand research question was: *What leadership characteristics are necessary to lead nonprofit organizations through complex adaptive systems such as DE?* I tested for six dimensions of CLT leadership characteristics in DE in the qualitative strand of the study by interviewing key informants of DE. Beginning with the CLT dimensions leadership characteristics aids in the comparison of CLT and DE leadership characteristics.

- Catalyze change
- Collective identity
- Creativity
- Connectedness
- Comfort with complexity
- Continual learning

In addition, five emergent dimensions arose from the qualitative strand data:

- Credibility
- Cultural Awareness
- Content Knowledge
- Sensemaking
- Stewardship

The qualitative strand of the study was intended to learn what experts in the field—DE coaches—feel the characteristics of leadership in developmental evaluation look like in actuality. The characteristics of DE coaches, such as credibility, appreciative inquiry, content knowledge, process facilitation, pattern recognition, active listening, and

tolerance for ambiguity, are described in the literature (Dozois, Langlois, & Blanchet-Cohen, 2010; Gamble, 2008; Patton, 2011), but leadership characteristics are not dwelt upon.

I utilized characteristics described in the CLT literature as a foundation for DE leadership characteristics, because both DE and CLT profess to operate in complex adaptive systems. The semi-structured interview questions began with questions about the environment in which DE-coached organizations operate, then asked questions to determine the presence of leadership characteristics related to the six dimensions of leadership in CLT.

Qualitative Sample. Key informants who are considered experts in DE (Innoweave, 2016) identified what they observed to be characteristics of leadership within organizations participating in DE. Participants for the qualitative strand were drawn from Innoweave, an initiative of the J. W. McConnell Family Foundation of Montreal, Quebec, Canada. The J. W. McConnell Family Foundation developed Innoweave to support its efforts to implement Developmental Evaluation (DE). Innoweave trains Developmental Evaluation coaches, who are listed on the Innoweave website, along with their contact information. Randomly selected coaches, who work with communities of organizations to develop ongoing evaluation and adaptation of programs, were given the opportunity to participate voluntarily.

The complete list of DE coaches is small (N = 57 as of 21 December 2016). In order to create a representative sample, DE coaches were randomly invited to participate in interviews, and to discuss multiple experiences (if applicable). DE coaches were first sent an email message explaining the study and indicating he/she would be contacted by

telephone to be asked to participate in an interview. The follow-up phone call was solely to ask the coach to participate in an interview and to set a time for an interview for those agreeing. Nine coaches were initially invited to participate, with five accepting. Those who agreed were interviewed via the Zoom video conferencing program, which has the capacity to record the interview so that the researcher can review the interview multiple times as necessary to elicit complete information.

Qualitative Instrument Development. The semi-structured interview was designed to learn about DE coaches' experiences in practicing DE. The questions probed to uncover the observed leadership attributes and to learn what challenges arose. The list of questions in the semi-structured interview is attached as Appendix 1. Survey questions were developed by the researcher, who has practical experience in DE (although not trained as a coach) and an understanding of CLT and complex adaptive systems within which nonprofit organizations operate. Questions were also informed by CLT leadership characteristics. Two DE coaches

Qualitative Data Coding and Analysis. Data from interviews was collected and coded shortly after each interview was conducted. The reason for coding quickly is twofold: to improve researcher recall about the interview and to find a point of saturation of the data as suggested by Lincoln and Guba (1985). *A priori* codes consisting of CLT leadership attributes (see Table 1) were used. Data was mined for *a priori* codes first, then mined separately a second time for emergent attributes. The two-step process minimized mixing of emergent codes with *a priori* codes (Merriam & Tisdell, 2016). Emergent codes fell into the DE leadership attributes from Table 1 that CLT does not include.

Qualitative Strand Trustworthiness. My own previous use of DE (although unaware of it at the time) positions me as favorable to DE and its outcomes. I feel DE is a practical and useful application of CLT. This poses a potential risk of minimizing the negative aspects of DE. To help mitigate this bias, a list of survey questions in the semi-structured interview were submitted to several DE coaches for feedback and discussion prior to development of the final survey, particularly inquiring about any additional questions that should be asked of respondents. A detailed account of the methods and procedures used, especially for those used to develop categories, was logged and serves as the basis of the audit trail described below. I also use thick descriptions to illustrate findings in a way that does not violate confidentiality.

Lincoln and Guba (1985) explain several ways to increase the trustworthiness of qualitative research. Credibility, transferability, dependability, and confirmability often substitute for internal validity, external validity, reliability and objectivity used in quantitative research. Credibility is when data are believable from the perspective of study participants (Lincoln & Guba, 1985). Once the initial set of questions intended to guide the researcher through semi-structured interviews to collect qualitative data were developed, they were submitted to two DE coaches (who were not participants in interviews) and one expert in qualitative studies for review. Submitting to the DE coaches asks participants to engage and make sense of the questions from their perspective of DE.

The results were enlightening. Both DE coaches suggested changing the word "coalition" in the original draft; a more meaningful word to DE coaches is "network." One DE coach also asked for more context, which indicated that an explanation of the

purpose of the interview is needed before starting the questions. The qualitative research expert particularly liked the sequence of the questions, however she also wanted additional context, such as whether the questions would be asked face-to-face, how long the interview might last, and what is the overarching question. She wanted clarity in the follow-up to the first question, and to use "what experiences led you to become a DE coach," as the use of the word "why" could be off-putting. She also suggested combining two questions since the second of the two seemed like follow-up to the first. The two questions were combined to make the new question 7.

Other methods of trustworthiness—transferability, dependability, and confirmability—focus more on processes during and after data collection. Transferability refers to allowing the findings to fit within similar contexts (Merriam & Tisdell, 2016). I utilized the principles of maximum variation (Merriam & Tisdell, 2016) as well as I could, not knowing the background of each DE Coach. This aids in the transferability of findings. Maximum variation included various geographic locations of the DE coaches and their DE initiatives, the number of initiatives they evaluated, and the clientele (including inter- and intra-organizational projects). Dependability, or consistency, refers to *post hoc* results that are consistent with the data collected but account for dynamic contexts. Using audit trails (Merriam & Tisdell, 2016) to ensure others understand how a researcher arrived at her or his findings, and the researcher clearly positioning herself or himself in the study are two ways to improve a qualitative study's dependability (Merriam & Tisdell, 2016), both of which are provided in this study. Finally, confirmability typically occurs during data collection and analysis, and involves using peer review of protocols, transcripts, coding and analysis, and interpretation through the

provision of an audit trail (Merriam & Tisdell, 2016). As a dissertation, some of these options were limited to me, however I was able to triangulate my qualitative data with very recent literature involving case studies. Although the case studies did not specifically study leadership characteristics, the detailed descriptions of the cases allowed me to glean many of the characteristics.

Qualitative Results

Sample. Participants in the qualitative strand of this study were seven key informants. Each has been a DE Coach for multiple projects, ranging in number from two to more than twenty. Prior to their DE experience, each had already been an evaluator using other methods, and all continue to use both DE and other evaluation methods as appropriate. One of the respondents authored an authoritative book about DE.

While saturation of data appeared to have been reached after only five interviews, a sixth interview with a co-author of one of the early books about developmental evaluation, was attempted, but I was unable to arrange it. In place of that interview, a DE coach recommended by an earlier interviewee and who led a major, successful DE initiative, and another DE coach who is probably the most experienced DE coach and who worked with experts in the field were interviewed.

Data Collection. Audio/video records were made of the interviews. Responses to the interview questions rarely required probing. One respondent needed probing questions about outside expertise; another needed probing questions about operating in complexity. A third respondent was asked probing questions about topics the respondent raised: funders and relationships. The audio/video recordings were transcribed into

written documents which I examined thoroughly for phrases and words that denoted leadership actions.

Questions were generally asked in order (see Appendix 1, Semi-Structured Interview Question Guide). If an interviewee volunteered the answer to a question before it was asked, I only asked that question when it came up later in the original order if I felt the initial response was incomplete.

Each interview lasted one to one-and-a-half hours. Responses were recorded and transcribed verbatim. Words and phrases relating to leadership characteristics were entered into NVivo qualitative data analysis program, then coded into themes—the six *a priori* dimensions identified in CLT and items that did not fit into one of those dimensions were sorted into emergent themes. Some emergent themes were identified in DE literature, one (Cultural Awareness) was a new theme identified by respondents.

Each interview question referenced one theme of CLT leadership, without directly naming it. Respondents generally were all thoughtful about their answers and I allowed for wide-ranging responses. It was clear from watching their expressions and gestures that they were responding without prior preparation.

Data Analysis. In each transcribed answer, I looked for words or phrases that corresponded to the theme of the question, then returned to look for other words or phrases that diverged into other themes and emergent themes. In most cases, a respondent emphasized one or two of the themes (his or her dominant theme) to the extent that it was not uncommon for a response to a question related to a non-dominant theme to refer back to the respondent's dominant theme. Once all terminology was sorted into dimensions, I placed the words/phrases into the appropriate categories in

NVivo, using inductive analysis (Merriam & Tisdell, 2016). The six themes from CLT, each identified by all seven respondents as important characteristics in DE, are:

- Catalyze change
- Collective identity
- Comfort with complexity
- Connectedness
- Continual learning
- Creativity

Five additional themes emerged from the interviews:

- Credibility
- Cultural awareness
- Content knowledge
- Sensemaking
- Stewardship

NVivo allowed me to select words and phrases to explain each theme in detail. It also helped me determine where overlap may lie. I consider each theme in turn below, beginning with its importance in CLT (why it is a selected theme) and describing how respondents alluded to it.

Catalyze change. The theme Catalyze Change is identified in CLT as interpreting rather than creating change (Plowman, et al., 2007) and creating transformational change (Uhl-Bien, Marion & McKelvey, 2007), in the sense of changing the abilities of the organization and its participants. Coaching, as defined by Wilson and Gislasson (2009) fits into this category:

> …a process that supports individuals to make more conscious decisions and to take new action. It helps them to identify and build on their strengths and internal resources and moves them forward from where they are to where they want or need to be. (p. 1)

This definition of coaching was used frequently by respondents because it aligns with the type of coaching they utilize as DE coaches. Respondent 5 refers to coaching as a role in *"trying to get [participants] to see something in a different way and take leadership."* Respondent 6 went into more detail about coaching, as *"how much people really need and can appreciate the DE coach being helpful, helping to illuminate insights and being disruptive."* This respondent felt that at the times DE coaches take leadership, they

> *...do a lot of nudging; sometimes we do a little more like jarring, less than nudging, but not very often. When you're not down in the weeds it's easier to say, "have you noticed this thing happening," or "I find it interesting that every time we come together that this thing comes up," and they'll say, "oh no I haven't really noticed that but now that you mention it…" Patton is always talking about the art of the nudge and knowing when it is important to do that. Sometimes it just takes a really good sense of knowing where a group is at.*

and later continued:

> *I see a lot of folks that just sit there and look at me for the answer, and that's very challenging because I think, "you guys have the answer, you know this work, you have the wisdom, this is your work. I'm here to help*

> *you have a conversation about the work but I'm not here to tell you how to do it." And so while I'll nudge, or I might make suggestions, or I might ask them to think about things, I'm not one of those persons making them think that I have the answers, that they don't somehow exist within themselves. And I think that's a leadership skill, and when I see leaders who can do that well, I think that's a gift and we need to help other people learn how to do that well.*

Catalyzing change includes knowing when to be directive and when to allow exploration and testing. Respondent 3 regarded *"knowing when to tighten the process and when to loosen it up is something that really makes a difference."* It also can become institutionalized. Respondent 2 *"found that over the years people started instituting these kind of small feedback mechanisms that would happen on a regular basis,"* and, as Respondent 6 noted, *"I think there is a real talent and art and skill in leadership to being able to help people to navigate complexity in a way that builds their own confidence and their own skills and their knowledge."* Such techniques, when they are operationalized, transform practices in organizations. A Theory of Change was regarded as a key way to catalyze change by Respondent 1 and Respondent 2. A Theory of Change can serve as a guide to nudge change if an initiative gets sluggish.

Collective identity. Lichtenstein, et al. (2008) suggest that a complexity-based perspective suggests leadership that does not lie within a person, but in *"an interactive dynamic within which any particular person will participate as a leader or follower at different times and for different purposes"* (p. 3) due to the emergent nature of events.

Hazy and Uhl-Bien's (2012) unifying function of complexity leadership theory promotes collective identities to coalesce this adaptive leadership role.

Respondent 1 identified a collective identity as necessary in DE:

> *I think in any developmental approach there needs to be—whether you're an external consultant or part of the internal role—it needs to be this kind of team approach, have ideas, have people you can bounce ideas off of, work more closely*.

Working in this way, in which leadership is distributed, according to Respondent 2, allows participants *"to develop a sort of confidence and trust with each other."* Respondent 2 also indicated some ways collective identity was built: *"they created…forums or they could share a lot of their experiences about how things were changing in their environment, and they had helpful advice for each other."*

Respondent 5 felt it was related to a *"sense of belonging."* Several respondents talked about the value of a community of practice, in which, as Respondent 6 explained, *"they decided that they wanted to try to knit together all the various good practices and learning across the system by connecting practitioners."* Without DE, Respondent 6 indicated,

> *...we would have had a fine program or initiative, but I don't think it would have been as transformative as it turned out to be and also because we actively engaged the participants in a process that they set themselves.*

Collective identity involved all those aspects: the participation made it more collective, the shared process building made it distributed and team-building, and the transformative

nature increased the sense of identity, as a challenge each participant went through with other participants.

Comfort with Complexity. Marion and Uhl-Bien (2002) state that it is important that complexity be recognized and accepted in CLT. Leaders cannot control the future because in complex adaptive systems, unpredictable dynamics determine future conditions. Hazy and Uhl-Bien (2012) assert that there is considerable ambiguity in complex systems when fine-grained action is linked to coarse-grained properties, when translating information into strategies and implementation, and when individual connections that are interdependent and heterogeneous tend to be unique. This requires comfort with complex conditions in order to guide or facilitate through them. Plowman, Baker, Beck, Kulkarni, Solansky, and Travis (2007) and Plowman, Solansky, Beck, Baker, Kulkarni, and Travis (2007) found effective leaders enabled such emergent futures by disrupting behaviors that surfaced conflict or tension and created uncertainty when in complex adaptive systems.

Respondent 6 referred to DE as complex in this way: *"It's like nailing jello to the wall."* That respondents considered comfort with complexity as necessary to leadership in complex adaptive systems was evident in their responses. Respondent 7 believed that, *"People work differently within an organization so there's always some element of collaboration, which means there's always some element of conflict and I think the ones that do well modulate between enough conflict but not too much."*

Respondent 6 saw real value in being comfortable in these modulations stating,

> *I think one of the biggest challenges is…for leaders to really have not just an understanding of complexity but the courage to live in it, and not just to live in it*

but—I think one of the things I found most effective about this [one] leader at the [named organization] is that she loves complexity, loves and lives and breathes complexity.

Respondent 5 also indicated the value of comfort with emergent aspects: *"All those pieces fitting together in this sort of theory of change, they get that and can use that. That's a real highlight for me."* It was the dominant theme of Respondent 7, the most experienced DE Coach, who stated flatly: *"I would say a really good understanding of complexity is important."*

Connectedness. Uhl-Bien, Marion and McKelvey (2007) note that complex adaptive systems "require new models of leadership because problem solving is performed by *appropriately structured social networks* rather than by groups coordinated by centralized authorities" (p. 304; italics in original). In addition, leadership in complex adaptive systems responds to changing constraints in the environment partially through collaboration (Hazy & Uhl-Bien, 2012). These statements indicate the necessity of connectedness as an attribute of CLT. The connectedness theme differs from Collective Identity in that the former is associated with external (to the organization or network practicing DE) relationships while the latter is associated with internal relationships.

Respondent 3 noted that connectedness includes the ability to "read" others in the network, *"…to really adapt to what the network or group needs at that moment. I think that makes it helpful."* Respondent 3 emphasized the networking aspect of leadership in complex adaptive systems, necessary because of the continual learning aspect: *"Because it becomes more of a learning environment, you have to make sure it works and have to get on the ground, 'let's go we're going to operationalize something,' testing it,*

experimenting, start talking about it with other folks," and *"[DE practitioners] need a lot of openness, when we can brainstorm a lot of things."* Respondent 4 also noted the importance of connection: *"you really want to connect with other people that are working on this and here at least make sure that they are engaged because otherwise [a DE initiative is] just too much of a risk."*

To Respondent 4, this connectedness is necessary at the beginning of a DE initiative:

> *You have to start, in my mind, with a really good understanding of how do you and how do your partners understand together this change that you're trying to create, and how do you understand this larger issue that you're working on.*

Connectedness could be linked to larger systems, as Respondent 5 did, *"…so, if I was in this particular space within an organization, like I was running an organization, right? I knew that I was part of something much bigger."*

Connectedness helps participants realize they *"share a common story"* (Respondent 5); it allows them to *"…assess common outcomes, and they could look at the environment that they were in together, using a common language"* (Respondent 5). Respondent 5 also highlighted the benefits of being connected: *"If you find others who are doing the same issues as you, that will create solidarity."*

For Respondent 6, connectedness is linked to inclusiveness, *"Because they have this way of thinking they're always bringing in people with different expertise, different lenses on the work. For me it just makes the work so much richer—also challenging but the challenges just keep getting better."* Respondent 7 described an initiative in which

> *...we're trying to build a relationship with each other, trying to drive better use of evidence learning and sharing a practical learning across organizations and then also connecting people who might work on one kind of support building bridges to organizations working on different kinds of reports and maybe building bridges so they could work more comprehensively.*

Continual learning. Hazy and Uhl-Bien (2012) assert that the "acquisition of leadership skills by individuals is the result of social learning of the meta-capability within organizations" (p. 22). Adaptiveness is one of the four core characteristics of complexity, and adaptive leadership (Heifetz & Laurie, 1997) is a key component of complexity leadership. Adaptation "engages individuals and organizations in search, experimentation, and variation to enhance creativity and learning" (Hazy & Uhl-Bien, 2012, p. 25). Continual adaptation and learning, then, is required in complex adaptive systems, and continual learning becomes an important feature of leadership in complex adaptive systems.

Respondent 2 stated, *"...we're going to learn together, assess our progress together, and then if we're making some progress how do we know we've accomplished our goals?"* Respondent 5 began talking about *"learning by doing,"* but quickly turned it into *"learning while doing."* In other words, the learning and action in DE occur from each other, as Hazy and Uhl-Bien (2012) suggested it does in CLT. Learning while doing highlights the ongoing adaptation being undertaken in the continual learning process. It may also indicate the need for, what Respondent 2 calls, a *"leadership connoisseurship,"* in which a smorgasbord of leadership abilities—diverse experiences from which to draw and which to apply appropriately—are available. Respondent 3

insisted that in *"every single meeting everybody is learning something. But yes, I would say that there would be regular learning that is taking place at different moments during the process."*

Respondent 7 talked about the continual feedback loops that occur in DE, emphasizing the importance of beginning with action: *"do things to get some system feedback and then you can proceed with how in complexity you're responding to the stimuli and then analyzing the thing that you're doing."* This respondent stressed that *"social innovators are doing, so that's their learning most often. I find getting them doing and then feeding back to them is good for them…do things to get some system feedback."* As an ongoing-process, DE pays particular attention to education and achieving consensus, making continual learning a key aspect of any DE initiative.

Respondent 3 explained how the learning process is continual:

> *DE allows people to make mistakes… and there's a place for that, you know, like, they can have a little bit more breathing room to test things out and experiment. And you know to a certain extent…some things don't work. So, it becomes more of a learning environment. You have to make sure it works, like testing it, experimenting, start talking about it with other folks,*

so that a learning culture within the context of the larger network develops. Respondent 6 also observed organizations in a network that *"knit together all the various good practices and learning across the system by connecting practitioners through a community of practice…testing this and learning about that and having more learning conversations about what was emerging."*

Respondent 6's dominant theme was a community of practice, which the respondent regards as a link between continual learning and collective identity. The link was clear in one DE initiative that established *"learning days and reflection meetings"* and *"being intentional about learning and…see what emerges, and shifting course"* based on what emerged. In other words, *"being thoughtful and intentional about learning"* (Respondent 6). Respondent 5 observed learning from the network as well: *"the learning becomes generative from other organizations in particular."*

Creativity. Plowman et al. (2007) found that leaders in complex adaptive systems encouraged innovation; they challenged organization members to come up with ideas and form committees to investigate ideas. Hazy and Uhl-Bien (2012) explain that adaptations elicit innovations that can be exploited to the benefit of the organization; creativity and innovation are important in complex systems to adapting procedures to changing circumstances. The co-evolutionary function of complexity means adaptation to changing conditions in the environment promotes creativity simultaneously.

Respondent 2 indicated that *"when people come together one of the different things you might want to do [is] to create together, to create something that no one has ever thought of on either side before."* Respondent 3 referred to these people as *"the forward thinkers of the organization that can pull the organization into certain, maybe new spaces."* Respondent 5 felt creativity is necessary when leading complex systems:

> *What motivates me is just good effective practice and management running organizations; in that practice you need to have new perspectives on what you do. I want people to challenge the experts…I want to say, you and your clients are the researchers.*

Respondent 6 was more to the point about being creative: *"Absolutely be willing to chuck your agenda out the window when you realize that the group needs something very different."* Respondent 7 included creativity and innovation as part of the process:

> *You almost always have to proceed with a little bit of uncertainty around what you're doing and have some comfort in that, and confidence that you are able to figure that out, the doing of something and getting people to start to experiment.*

Unlike the six *a priori* themes above, none of the emergent leadership characteristics were noted by all seven respondents, although each was identified by multiple respondents sufficiently to be included as themes. It should be noted, furthermore, that unlike the *a priori* characteristics, each emergent theme was raised without prompting from the interview questions.

Credibility. Credibility is a leadership characteristic that emerged from the interviews of some DE coaches. It is not identified in the CLT literature as a leadership characteristic although it is found in Gamble (2008) as important to DE, but not Dozois, Langlois, and Blanchet-Cohen (2010), Patton (2008), or Patton (2011). Respondents 1, 2, 5, 6 and 7 noted the importance of credibility in DE leadership. Credibility was expressed through shared principles and being knowledgeable about evaluation, particularly DE.

Credibility, as described by the key informants in this study, arises from the ability to maneuver through the process of Developmental Evaluation, not domain knowledge of issues the DE organization or network addresses. Expertise, knowledge, and the ability to manage relationships is frequently honed through experience, however

in the case of the credibility theme, the source of experience is not necessarily from DE. Indeed, many of the leaders described by the DE coaches had no prior experience with DE.

Respondent 1 referred to the difficulty of practicing DE, a constantly adapting initiative: *"I think it's a struggle trying to figure out, and I think what helps a little is by talking about some of the principles; about what is, you know, what is DE at its core."* Similarly, Respondent 7 regarded DE as something social innovators do. The term "innovation" tends to be overused, and Respondent 7 related credibility to being able to determine whether an initiative being evaluated was innovative or not:

> *When people think they're doing something that's innovative when they're not, that I think is the most common [challenge], is bias with the expectation to be innovative; so I think first and foremost managing that…it's helpful to understand what's truly innovative and what is not.*

Respondent 5 referenced that a deep knowledge of the DE process led to establishing leadership credibility within a DE initiative:

> *They would be having a serious change related to their vision/mission/values statement; it would be to be able to tell that story [of what changed], and they would have to look at the programs that they have, reflect on their outcomes.*

The knowledge of organizational structures and programs should be so well ingrained that telling the story becomes easier. This respondent also talked about being trained well in DE, or at least being able to overcome *"the obdurate training of different evaluation processes,"* suggesting other evaluation processes require rigid adherence.

One respondent saw credibility arising from the ability to manage relationships. Respondent 6 described with admiration a foundation program manager whose organization participated in a DE initiative who was able keep the foundation's stakeholders engaged (important since this was the primary funder of the initiative),

> *…she was quite masterful in managing both her board and her CEO's expectations and needs and really this very complex set of relationships that was coming together around this table with the various partners who were part of this process.*

Cultural awareness. Cultural awareness is not visible in the CLT or DE literature, yet was raised as a DE leadership characteristic by four of the seven respondents in the qualitative strand of this study. Coaches who worked with normally-underrepresented populations stressed the value of understanding and incorporating cultural attitudes, and even learning from the culture. Others mentioned the value of organizational cultures within a network of organizations. Respondent 1 referred to it in the organizational sense: *"Make sure that the process you're dealing with is what they [DE client organizations] are wanting and make sure it fits into that cycle of innovation."* Respondent 7 also talked in terms of organizational culture, being aware that some organizations operate in *"very hierarchical structures, with what is clearly an 'alpha' and is someone in charge of decisions being made, and that's fine too and can actually work very well."*

Respondent 5 also discussed cultural awareness in terms of organizational culture, *"some of those cultural attitudes are very, very against the kind of work that we need to be doing;"* however, Respondent 5 noted that these cultural attitudes can be embedded:

"some people just think that way." Respondent 5 suggests that leaders reflect on working with their teams by learning *"the culture going together."*

Respondent 6 went further to suggest cultural awareness is important when dealing with cultures different from the leadership's own. This respondent described

> *a pan-Canadian group that's…adult educators who are working in the area of social justice with a big women-led focus and an indigenous-led focus. So a good challenge for me there is really thinking through and honoring women-led and Indigenous-led ways.*

Patton (2008, 2011) describes DE as highly participative. Cook, Godiwalla, Brooks, Powers and John (2010) indicate that respect for cultural beliefs are critical to participation in any evaluation effort. Alaimo (2008) suggests considering cultural awareness and sensitivity from external stakeholders (such as funders) and internal stakeholders (such as executive directors). The key informants provided examples of cultural sensitivity to both types of stakeholders.

Content knowledge. Content knowledge relates to the knowledge of the issue or issues related to the DE initiative, not the processes of DE themselves. Content knowledge shows up as important to DE in Gamble (2008) but not Dozois, Langlois, and Blanchet-Cohen (2010). This theme was also noted by four of the seven respondents. Respondent 1 considered *"pulling on different knowledge bases, different programs, different ideas"* as critical to improving content knowledge, and saw it frequently in DE initiatives. Respondent 7 talked about leaders having *"that sort of political antennae and relationship antenna [that] is very, very important,"* as critical to gaining and developing content knowledge.

Respondent 7 suggested that experience adds to the content knowledge:

There is a place for someone who has lots of experience across different domains and with different organizations, to say "here's an observation not based on the data of your initiative but the data of my experience with 20 different initiatives," or that "here's something you might want to think about or here's a possibility for you in terms of a place you could go or something you could try or something I've seen work elsewhere," and as one moves through one career probably assert yourself more.

Respondent 6 suggested that this experience helps leaders develop a useful sense of intuition:

Patton is always talking about the art of the nudge and knowing when it is important to do that and it takes a really good sense of intuition, and sometimes it just takes a really good sense of knowing where a group is. It's like knowing when to throw in the lifesaver.

Respondent 7 asserted, *"So I think it's a function of leadership and bringing that kind of expertise or experience—or experience base—into the initiative, and I think there's a need for that."*

Sensemaking. While one study (Plowman, Baker, Beck, Kulkarni, Solansky, & Travis, 2007; Plowman, Solansky, Beck, Baker, Kulkarni, & Travis, 2007) of CLT touches on sensemaking as important, it rarely shows up in the literature for CLT or DE, which is why it is surprising that DE coaches brought it up as frequently as they did. Five of the seven DE coaches interviewed emphasized the value of sensemaking in leadership within complex adaptive systems.

Respondent 7 explained the need for sensemaking, describing it at the same time:

Complexity can be an excuse to avoiding a hard-outcomes orientation. Developmental evaluation is not just a process, it's not just what we're learning; it's accelerating this process and accelerating that learning, with the ambition of working towards some kind of outcome, some kind of objective. That objective can be vague and get sharper over time; that's fine, that's part of the nature of innovation… but I've seen lots of successful DEs sort of baking [a coaching] orientation into the leadership of the agency, checking points, making good use of easily available data, asking some very good questions at the right time.

Respondent 4 sees strategy development as a form of making sense:

Another [challenge] has been helping the organization to break down, kind of, what it is, so how do you try to prototype part of a strategy, how do you, kind of, do that in a way that makes sense and doesn't take a lot of resources.

This respondent also emphasized a focus on manageable components of a DE initiative:

You may say for a certain initiative, "which part of this are we going to work on?" Very rarely are you going to say, "…we're going to take on this entire issue and deal with all of these complexities." It's beyond the limitations that any one organization or group can take on.

Respondent 7 reinforced the value of strategy when dealing with the complexity of a DE initiative

> *It's a rare person who can lay bare all of that thinking and make that acceptable to others. Those people are strategic programmers. Social innovators are doing, so I find by getting them feedback is good for them to get clarity.*

Strategy development is clearly one way of making sense of the work in complex adaptive systems. Several respondents relied on developing a theory of change as a strategy to make sense. Respondent 5 likened sensemaking to epiphanies: *"I guess for me the highlights are moments when people do connect the dots with what they want to achieve. That and why they're using DE…just all those pieces fitting together in this sort of theory of change."* Sometimes outside expertise can help make sense. Respondent 6 related a time that was helpful: *"I recommended at different points that we needed somebody who was good at measurements, so we brought in a business partner [who's] doing a whole data audit across the organization…and we'll be doing sense-making around that.*" Respondent 6 added two more stories about another expert:

> *After [an organization] developed the theory of change, [the executive director] brought in this guy who's a really brilliant graphic designer. He didn't know anything about theory of change or anything, but he spent a few minutes listening to us, listening to a very complex theory of change and he Illustrated it and he made this beautiful booklet and it's become incredibly popular and everywhere we go people want copies of this booklet because it's a real living example of a theory of change that actually means something and is actually iterating and evolving. And we also worked with him, we did this big network mapping exercise where we're tracking social relationships, and he showed us this great*

software to turn that network map into this digitized tool. So now we have this digital tool that we're using to show their networks and their relationships.

Processes also help with sensemaking. Respondent 6 felt that *"it's just how thoughtful you need to be about the way that you design the conversations,"* and *"it's really pushed me out of a comfort zone into designing things like doing a lot more storytelling; I think storytelling is an important part of DE."*

The many interacting variables of complex adaptive systems can easily become confusing. Finding some way for participants to make sense of all these interactions—identifying coarse-grained and fine-grained nature of complex systems—is often necessary to understand the weblike pattern and constant structural changes within the system.

Stewardship. Stewardship was referenced by three DE Coaches. Respondent 7 likened it to servant leadership (Greenleaf, 1977), while also explaining that a DE Coach sometimes takes leadership: *"I would see myself as in service; I'm a servant to their larger process. That said, I think a DE evaluator exercises more leadership than a traditional evaluator."* In this sense—being in service to the process and its participants who are equally participating—DE coaches saw servant leadership as necessary to stewarding a DE initiative. Servant leadership is emphasized in Dozois, Langlois, and Blanchet-Cohen (2010), but not in the other DE literature.

Respondent 2 saw leaders as stewards—agents not so much of the owners (unless one thinks of the project as "owned" by all) but of the process. This concept of stewardship leadership is intriguing. It implies a high value on shared principles and servant leadership.

Respondent 2 went into detail about stewardship as a substitute for leadership:

I've been big on the notion of stewardship as opposed to leadership because stewardship is about facilitating the work of owners, so there are owners and they invite a steward to sort of look after their interests. That's how we understand it, but further than that stewardship can also be created and not just by a person but a process. You can create a process by which, you know, as things move along you consider this and the next day you consider that… instead of leadership you have to start thinking about what are those things that we need to do in order to keep people engaged? What do they need to see that this whole process is going to be valuable for them so that they can be valuable? And that's where this notion of stewardship comes in, trying to design a process that they can all feel comfortable with.

Three of the five emergent leadership characteristic themes and all six of the CLT themes were identified in the DE literature. Cultural awareness and sensemaking are two new themes that emerged from the qualitative surveys. All themes were triangulated with case studies in Patton (2016).

Qualitative Data Triangulation

Themes and codes were triangulated using thirteen case studies of DE and two practitioner reflections found in *Developmental Evaluation Exemplars* (Patton, 2016) from which leadership characteristics could be extracted. It was in reading this book that the concept of leadership within the processes of DE—the interactions between people or groups—became clearer. DE is a complex process in which leadership cannot rest in only individuals. As described in CLT, leadership entails the interactions between

participants in complex adaptive systems (Lichtenstein, et al, 2006; Plowman, et al., 2007; Plowman, et al., 2007; Uhl-Bien, Marion & McKelvey, 2007).

Each leadership characteristic theme was found in the descriptions of the case studies (Patton, 2016). Catalyzing change, the first theme of CLT leadership, has been expressed in CLT as interpreting rather than creating change and creating transformational change (in the sense of transforming individual and participant organizations); catalysts are effective leaders. In DE, Catalyzing Change is manifested in coaching, and elucidating and facilitating assessment and decisions making. In triangulating catalyzing change was raised in twelve of the thirteen cases and both reflections in Patton (2016). A theory of change was mentioned frequently in the cases; other descriptions of catalyzing change include: affectively orchestrate; positively challenge team members; knowing when to step in and challenge the direction, and; the art of the nudge.

In the DE literature, collaborative and shared leadership, and teaming and collaboration are regarded as important aspects of collective identity. Ten of the thirteen cases discussed Collective Identity in Patton (2016). Terms such as sharing resources and knowledge, equity, collaboration, and participative repeated themselves in the descriptions of the case studies, indicating the importance of collective identity as a leadership characteristic in DE.

Comfort with complexity as an important leadership characteristic in DE was mentioned in eleven of the thirteen case studies and both reflections in Patton (2016), in such phrases as “sit comfortably with ambiguity,” “situations with multiple pathways

possible," and "embrace unknowability." Cases emphasized the value of focusing on adaptability and flexibility in DE.

In the DE literature, the concept of community connectedness can be related to the CLT concept of connectedness. Connectedness was identified as important in twelve of the thirteen case studies and both reflections in Patton (2016), through values such as working collectively and being in partnership with others, resulting in things such as trust, shared vision, relationships and negotiation.

The DE case study literature refers to continual learning aspects, such as feedback loops, feedback-adapt-revise along the way, setting aside time for reflection, learning by doing, reflective practice, and analyzing emergent findings in all thirteen cases and both reflections in Patton (2016).

In the DE literature the theme of creativity can mean being curious and willing to test, continuous improvement and adaptation, and creating something new that had not been thought of before. It was mentioned in eight of the case studies and both reflections in Patton (2016).

Emergent leadership themes found in the Patton (2016) case studies, included credibility, cultural awareness, content knowledge, sensemaking, and stewardship. It was noted that all the emergent leadership characteristics were raised less frequently by respondents of the survey and in the case studies in Patton (2016) than the *a priori* leadership characteristics. The lower frequency of references in the case studies suggests these themes may be less important leadership characteristics in DE than the CLT leadership characteristics. Still, they are referenced sufficiently to include in the later quantitative strand to help determine their relative importance.

In the case studies, credibility is mentioned in four cases and one reflection in Patton (2016), invoked as shared principles, being well-trained in the field of primary interest to the project, and coordinator credibility. Cultural awareness is revealed in six case studies and one reflection in Patton (2016), as people skills, staying attuned, being responsive to context and process, and flexibility to meeting the needs of various populations. Content Knowledge is mentioned in five of the cases and both reflections in Patton (2016), citing needed skills, practice, and a highly developed understanding of the context. Sensemaking, in terms of building understanding and interpreting information, arises more frequently in the case studies—in all thirteen of the cases and both reflections. Stewardship is featured in four of the cases and both reflections, as relationship-focused, attentive, and servant leadership.

Qualitative Strand Summary

The six *a priori* leadership characteristics were all found important in the qualitative interviews for leadership in DE. These characteristics were also found critical to CLT, creating a strong correlation between leadership characteristics in CLT and leadership characteristics in DE. In addition, five emergent characteristics were discovered in the interviews discussing DE leadership. These emergent themes add to previously identified leadership characteristics in complex adaptive systems. CLT theorists may find adding the emergent themes more effective in measuring leadership in complex adaptive systems. Including the emergent themes in the CLT model could make testing the theory from practical data more robust. My next step was to determine whether all these leadership characteristic themes were observed by a different population of DE practitioners, to verify the results of the qualitative strand.

Chapter 4: Quantitative Strand and Data Integration

The second phase of the exploratory study was a quantitative strand.[5] The quantitative strand was driven by the question: *Are the leadership characteristics expressed by the DE coaches an accurate depiction of DE leadership in practice?*

In an exploratory design, the quantitative strand is intended to triangulate the findings of the qualitative strand, in this case to verify data gathered from DE coaches. Employing both qualitative and quantitative methods—as well as using different sample populations—enhances the integrity of the findings. The qualitative research provides contextual understanding of leadership characteristics in DE while the quantitative survey provides generalizable, externally-valid findings. The quantitative research augments the qualitative findings.

The context of leadership characteristics in the quantitative strand began with the six themes in CLT and five emergent themes found in the qualitative strand. Statements made by key informants from each theme were used as variables in the respective themes, and a survey instrument was developed to explore the relationships between the themes and variables through factor analysis. Although there was not sufficient data to run a full factor analysis comparing all the variables in the quantitative instrument, data was sufficient to run a factor analysis on each theme. Field (2013) cites a rule of thumb of ten to fifteen participants for each variable; this study, with 54 variables, would have required at least 540 respondents to conduct a reliable full factor analysis.

Hypothesis development for the quantitative strand was based on the results of the qualitative strand. A hypothesis regarding the qualitative data,

[5] Approved by the James Madison University Institutional Review Board, protocol No. 18-0019.

Hypothesis 1: The variables identified for each theme of DE leadership characteristics can be reduced to one factor

derives sub-hypotheses for each theme as noted below.

Leaders in complex adaptive systems are catalysts of network building to create adaptive change and shared visions (Marion & Uhl-Bien, 2002). Catalysts are more likely to interpret change and ask probing questions than to initiate change themselves (Plowman, et. al., 2007). Gamble (2008) identifies this catalyst quality through coaching and teaching, relationship building, and recognizing patterns and making connections. Patton (2008) adds the encouragement of relationships that increase access to information, challenging experts which in turn facilitates the assessment of decision making.

Hypothesis 1a. One factor (Catalyzing Change) is sufficient to explain the variation in the observed variables *Shared Visions, Experts Challenged, Facilitated Problem Solving, Spent Time Teaching,* and *Asked Probing Questions*.

Effective leadership in complex adaptive systems unifies interactions through collective performance and adaptation (Hazy & Uhl-Bien, 2012). Plowman et al. (2007) suggest collective performance and adaptation is conducted through distributed or shared leadership. These two characteristics should correlate highly, creating a collective identity factor that can be identified in DE as collaboration and sharing of information and decision making (Gamble, 2008) and teaming and collaboration (Patton, 2011).

Hypothesis 1b. One factor (Collective Identity) is sufficient to explain the variation in the observed variables *Team Members Were Open, It Felt As If Team Oriented, Participants Had A Sense Of Ownership, How Work Contributed Was Important,* and *Shared A Common Story*.

In a setting in which leadership is shared and organizational learning is constant, relying on feedback loops that may contain incomplete information, there comes a point of nonlinearity when predicting outcomes is difficult (Hazy & Uhl-Bien, 2012). Successful leaders in complex adaptive systems will be comfortable with ambiguity, one of the primary aspects of complexity. Plowman et al. (2007) suggest that leading in complex adaptive systems actually push an organization toward disequilibrium by introducing uncertainty and acceptance of complexity. Gamble (2008) and Patton (2011) indicate that tolerance for ambiguity is required to effectively work in DE.

Hypothesis 1c. One factor (Comfort with Complexity) is sufficient to explain the variation in the observed variables *I Understand The Value, As A Team Sought Engagement, Provided The Necessary Time, Looked For Questions,* and *Demonstrated Comfort*.

According to Uhl-Bien, Marion, and McKelvey (2007), problems are solved through networks fostered through interaction and interdependency. Collaboration helps leaders respond to changes in the environment, and collaboration is the result of social learning (Hazy & Uhl-Bien, 2012). Community connections increases the likelihood of collaboration and network-based problem solving.

Hypothesis 1d. One factor (Connectedness) is sufficient to explain the variation in the observed variables *Orgs See Themselves, Many Experiences Were Shared, Participating Orgs Shared, Participants Cooperated,* and *Made Space For People*.

Complexity is characterized by feedback loops (Mitchell, 2009). Leadership in complex adaptive systems is characterized by them as well; organizational learning caught up in feedback loops builds upon itself rapidly (Hazy & Uhl-Bien, 2012). In DE, the process of questioning and learning happens simultaneously with action (Gamble, 2008); action leads to more questioning and learning, the very definition of a feedback loop. Leaders in DE facilitate this process to develop strategies and meaningfulness (Gamble, 2008).

Hypothesis 1e. One factor (Continual Learning) is sufficient to explain the variation in the observed variables *Communication Channels Were Open, Learned While Doing, Researched Who Was Doing, Mistakes Were Opportunities For Learning,* and *Allowed Others To Solve*.

Leaders in complex adaptive systems, who face change constantly, must do so creatively. Hazy and Uhl-Biem (2012) encourage exploitation and exploration in the human dynamic of generative interaction in ways to give new meaning to resulting outcomes. Familiarity with organizational change and strategy in order to identify strengths and vulnerabilities that affect innovation (Gamble, 2008) helps identify creative change. Dozois, Langlois, and Blanchet-Cohen (2010) recognize curiosity and a

willingness to test as leadership characteristics necessary to organizational learning that leads to continuous adaptation and improvement necessary for creative change (Patton, 2011).

Hypothesis 1f. One factor (Creativity) is sufficient to explain the variation in the observed variables *Principles Proven Effective, Create New Things, Helped Consider Options, Relished Opps For Creativity,* and *Orgs Were Creative.*

Trust is essential among key people who are involved with the innovative initiative. At the same time, their proximity to action may reduce credibility in the eyes of some funders or other stakeholders. Leaders must balance being both sufficiently close and independent. It is important to be flexible and not overly attached to specific outcomes (Gamble, 2008) and to use valid information for decision making.

Hypothesis 1g. One factor (Credibility) is sufficient to explain the variation in the observed variables *Went Beyond Self-interest, Participants Trusted, Used Data,* and *Were Trusted*.

Initiatives will be influenced by cultural factors that influence the motivational force for adaptive behaviors. Research that seeks to capture the temporal changes that occur in the adaptive dynamics within a team, and how these are influenced in response to changing organizational network conditions, will reveal data about the type of organizational contexts that support complexity leadership development (Lichtenstein, Uhl-Bien, Marion, Seers, & Orton, 2006).

Hypothesis 1h. One factor (Cultural Awareness) is sufficient to explain the variation in the observed variables *Participants Sought, People Impacted, As A Team Compassionate, Not Afraid To Share* and *Made Decisions After*.

Domain expertise is an asset in the role of strategic coach (Dozois, Cohen, & Blanchet-Cohen, 2010). Knowledge of the subject matter in an initiative can also enhance credibility with internal and external stakeholders. Having a current understanding of the field enables a deeper level of inquiry and can assist in framing discussions more appropriately (Gamble, 2008).

Hypothesis 1i. One factor (Content Knowledge) is sufficient to explain the variation in the observed variables *Participants Were Knowledgeable, Program In Participating, Participants Sustained Current Knowledge, Addressed Basic Ideas and Basic* and *Were Well-trained In Their Areas*.

Sensemaking is the process by which teams develop meaningful explanations for their experiences to scan the environment and interpret issues in order to influence decision-making and strategic change (Plowman, Solansky, Beck, Baker, & Kulkarni, 2007)

Hypothesis 1j. One factor (Sensemaking) is sufficient to explain the variation in the observed variables *Participants Continuously Looked for Ways, As A Team Consistently Connected, Sought To Build Understanding, Sought Change* and *Used Critical Analysis*.

Leadership positions are directly responsible for the innovation, growth, and fitness of the organization (Hannah, Avolio, Luthans, & Harms, 2008).

Hypothesis 1k. One factor (Stewardship) is sufficient to explain the variation in the observed variables *Specified The Importance Of Having, Held Others Accountable, Practiced Stewardship, A Set Of Principles Emerged* and *Provided Safe Spaces*.

Data from the qualitative strand was shown to be strongly correlated to the dimensions of CLT leadership characteristics plus five emergent dimensions.

Quantitative Sample. Participants for the quantitative strand were gathered through convenience sampling (Tansey, 2007) from the Innoweave website (Innoweave, 2016), which lists some organizations that participate in DE. In addition, the book *Developmental Evaluation Exemplars* (Patton, 2016) included twelve case studies, for whom contact information was found via the Internet. Finally, several participants were suggested by the qualitative strand respondents.

Identifying prospects for the survey was challenging. Extensive online research for contact information of the three populations was conducted. Some organizations could not be found on the Internet, and of those found, not all websites listed individual email contacts. Of the 739 contacts found and emailed, at least twenty were general email addresses for an organization, not contact information for individuals within the organization. Of the individuals, an unknown number did not participate in their organization's DE initiative. Some were not a part of the organization during the initiative others were in departments that may not have participated in the initiative.

Fifty-eight responses were received; four were deleted because the respondents answered less than half of the questions, leaving up to 54 respondents for each theme. In some themes, respondents did not answer all questions, further reducing the number of responses of some themes' questions by one or two.

A convenience sample has the disadvantage of bias toward those who are favorable toward DE. However, since I was seeking leadership characteristics, attribution bias (Kahneman, 2011) could expected to be less significant a problem than in most studies, since leadership characteristics in DE are of multiple individuals, not only one who is trying to find reasons for their own behavior. Convenience sampling is appropriate when it pertains to relevance (Ferber, 1977), as in this case in which the sample of DE practitioners have some knowledge about DE. Innoweave lists 23 organizations, and we can assume most, if not all, are part of larger networks of organizations.

To increase response rates, I sent prospective respondents an email message explaining the study, the benefits of completing it, and asking them to voluntarily participate in the survey. A link to the online survey was included. Sauermann and Roach (2013) suggest ways to increase response rates. As a result, multiple (two) follow-up email messages were sent between July 5, 2017 and July 19, 2017 to all 739 email addresses (the survey was anonymous, so I was not able to determine who had completed it and who had not), with the wording changed slightly to remind non-respondents to complete the survey.

Quantitative Instrumentation. A survey was developed to measure the observation of DE leadership characteristic variables found in the qualitative data. Being

clear about the leadership characteristics has multiple benefits Practitioners will be able to know who can lead through different types of circumstances in a DE initiative. Practitioners will also be clearer about the readiness of their organization or network for DE. CLT theorists will be able to measure leadership in practical applications.

The survey was conducted through an online instrument. Specific questions were derived from the qualitative portion of the study. See Appendix 2 for the survey questions.

Quantitative Instrument Development. The purpose of the quantitative strand was to determine how strongly the characteristics of leadership identified by respondents in the qualitative strand exist within DE as perceived by practitioners. By learning the characteristics of leadership identified by participants of organizations immersed in DE, we can understand how leadership actually emerges in DE.

Item analysis is usually conducted after surveys or tests are completed, in this research it was piloted by asking a small sample of participants to identify problems in a preliminary survey, such as:

- Confusing items
- Items that do not differentiate
- Items that do not "fit," in the sense that they are all measuring aspects of the same construct
- Items that have more than one answer

Specific questions were derived from the qualitative portion of the study. The survey places leadership characteristics into factors found in CLT, described as: Catalyze Change, Collective Identity, Comfort With Complexity, Connectedness, Creativity, and

Continual Learning. Additional leadership characteristics were placed into five emergent factors: Credibility, Cultural Awareness, Content Knowledge, Sensemanking, and Stewardship.

Survey development began with questions drawn directly from statements made by the key informants in the qualitative data. In many cases, the statements corresponded with questions used in existing surveys that identify similar leadership characteristics:

- The Multilevel Leadership Questionnaire (Bass & Avolio, 1995) tests for transformational leadership, a predictor of creative change; validity of the MLQ has been tested multiple times using confirmatory factor analysis (Corliss, 1998; Muenjohn & Armstrong, 2008);
- Wilson and Gislason (2010) developed questions to identify coaching skills, which are a predictor of a change catalyst;
- The WorkLife Design (2008) questionnaire measures change readiness, a predictor of complexity acceptance;
- Finally, the Readiness for Organizational Learning and Evaluation (ROLE) Instrument by Preskill and Torres (1999) tests for collaboration, a predictor of collective identity, for risk taking, a predictor of creativity, for participatory decision making, a predictor of a change catalyst, for organizational learning, a predictor of creative change, for process facilitation, another predictor of continual learning, for teaming and collaboration, a predictor of collective identity, and for evaluation process facilitation, a predictor of continual learning. Preskill and Torres (1999) tested the validity of this instrument.

Where questions in these surveys corresponded with statements made by DE coaches identifying leadership characteristics, the questions from those surveys were used in this study's quantitative instrument. Other questions in the instrument were developed using the format of those survey questions.

The quantitative method measures the characteristics of leadership found in developmental evaluation experiences against those expressed by DE coaches. Table 2 lists the variables and derivation of each. Most variables derived from statements made by respondents in the qualitative interviews. Some matched questions in one of the four surveys discussed above; in those cases, the questions from the previous surveys were used.

Table 2.
Derivation of Variables

Theme	Variable	Derivation note
Catalyze Change	Shared visions	Resp. 5
	Experts challenged	Resp. 5
	Facilitated problem solving	Wilson Gislason/Resp. 4
	Spent time teaching	Resp. 4, 5
	Asked probing	Wilson Gislason/Resp. 6, 7
Collective Identity	Team members were open	ROLE survey/Resp. 3
	It felt as if team oriented	Resp. 1, 4, 5
	Participants had a sense of	Resp. 4
	How work contributed was important	ROLE survey/Resp. 4
	Shared a common story	Resp. 5, 6
Comfort with Complexity	I understood the value	ROLE survey/Resp. 2, 4, 5, 7
	As a team sought engagement	Resp. 2, 4, 6
	Provided the necessary time	ROLE survey/Resp. 4
	Looked for connections	Resp. 4, 5, 7
	Demonstrated comfort	Resp. 5, 6, 7
Connectedness	Orgs see themselves	Resp. 5, 7
	Many experiences were shared	Resp. 1, 2, 3, 5, 7
	Participating orgs shared	Resp. 2, 3, 5, 7
	Participants cooperated	ROLE survey/Resp. 7
	Made space for people	Wilson Gislason/Rep. 3, 6, 7
Continual Learning	Communication channels were open	Worklife Design/Resp. 7

	Mistakes were opps for learning	ROLE survey/Resp. 3
	Learned while doing	Resp. 1, 2, 3, 5, 6, 7
	Researched who was doing	Resp. 5
	Allowed others to solve	Resp. 5
Creativity	Principles proven effective	Resp. 1, 7
	Created new things	Resp. 1, 5, 6
	Helped consider options	Resp. 1, 5, 6
	Relished opps for creativity	Resp. 1
	Orgs were creative	Resp. 1, 2, 7
Credibility	Went beyond self interest	MLQ/Resp. 1, 4, 5
	Participants trusted	ROLE survey/Resp. 2, 6
	Used data	Worklife Design/Resp. 5, 7
	Were trusted	Wilson Gislason/Resp. 2
Cultural Awareness	Participants sought	Resp. 1, 6, 7
	People impacted	Worklife Design/Resp 2, 5
	As a team compassionate	Resp. 5
	Not afraid to share	ROLE survey/Resp. 2
	Made decisions after	ROLE survey/Resp. 6, 7
Content Knowledge	Participants were knowledgeable	Resp. 6, 7
	Programs in participating	Resp. 7
	Participants sustained current knowledge	Resp. 1
	Addressed basic ideas and basic	Resp. 2
	Were well trained in their areas	Resp. 5, 7
Sensemaking	Participants continuously looked for ways	ROLE survey/Resp. 3, 7
	As a team consistently connected	Resp. 5
	Sought to build understanding	Worklife Design/Resp. 1, 4, 7
	Sought change	Resp. 1, 4, 7
	Used critical analysis	Resp. 5, 7
Stewardship	Specified the importance of having	Resp. 1, 6
	Held others accountable	Resp. 5
	Practiced stewardship	Resp. 2
	A set of principles emerged	Resp. 1, 7
	Provided safe spaces	ROLE survey/Resp. 3, 7

Note: Resp. = Respondent

Quantitative Instrument Reliability and Validity. Reliability of the survey used in the quantitative strand rests on the consistency of measurement, that is, the degree to which the questions used in the survey elicit the same type of information each time they are used under the same conditions (Scherpenzeel, & Saris, 1997). Reliability can be tested using Cronbach's alpha, although consistency with previous leadership

characteristic surveys is increased since many of the questions in the survey in this study were derived from those previous surveys; as noted above, many leadership characteristics of CLT and DE correspond with the leadership characteristics of earlier leadership theories. While item analysis is usually conducted after surveys or tests are completed, in this research it was piloted by asking a small sample of participants to identify problems in a preliminary survey.

Validity is concerned with the accuracy of measurement, and it is often discussed in the context of sample representativeness (Barron, Brown, Egan, Gesualdi, & Marchuk, 2008). Sample representativeness was addressed through maximum variation. However, validity is also affected by survey design since it depends on asking questions that measure what is supposed to be measured. In particular, content validity is related to the ability to create questions that reflect the issue being researched and make sure that key related subjects are not excluded (Barron, et. al., 2008). Many of the questions for this survey were originally used in various surveys seeking to identify leadership characteristics.

Internal validity asks whether the questions posed really explain the outcome being researched (Barron, et. al., 2008). Internal validity was maintained since many questions in this survey were originally used to identify leadership characteristics. The high communality values of the variables within each theme (see Table 4. below) indicate internal validity. External validity refers to the extent in which the results can be generalized to the target population that the survey sample is representing (Barron, et. al., 2008). External validity was measured once the number of respondents was determined.

Quantitative Results

A different sample was used to verify the qualitative findings. A scaled instrument was distributed during the period July 5, 2017 to July 19, 2017 (the instrument was kept open until August 11, 2017). Factor analysis was used to combine variables that are correlated with each other but largely independent of other variables (Tabachnick & Fidell, 2013).

While I sent multiple invitations to participate in the survey, it is unclear that it is possible to obtain 540 participants given the limited number of organizations that have participated in DE The survey did produce enough responses to run factor analyses for each theme (factor). The factor analyses indicate whether the variables within each theme correlate or whether there are variables in any theme that are factored out. Examining patterns of correlations between the variables and the themes in which they were correlated is used to verify the qualitative results.

Descriptive statistics. Means, standard deviations, and the sample size for the variables arranged by theme are presented in Table 3. The means are reported on a scale of 1 to 5, with 5 representing high observation of the variable in DE leadership. The high means indicate these variables were observed frequently by the participants.

Table 3. *Means, Standard Deviations, and N for all Variables*

Variable	*M*	*SD*	*N*
Shared Visions	4.34	.807	53
Experts Challenged	4.04	.940	53
Facilitated Problem Solving	3.49	1.137	53
Spent Time Teaching	3.43	1.201	53
Asked Probing Questions	3.89	1.219	53
Team Members Were Open	4.13	.561	52
It Felt As If Team Oriented	4.12	.714	52
Participants Had A Sense Of	4.23	.723	52
How Work Contributed Was Important	3.50	1.146	52
Shared A Common story	3.42	1.319	52
I Understood The Value	4.74	.442	54
As A Team Sought Engagement	3.72	1.235	54
Provided The Necessary Time	3.09	1.377	54
Looked For Connections	3.80	1.446	54
Demonstrated Comfort	3.83	1.112	54
Orgs See Themselves	4.15	.849	52
Many Experiences Were Shared	4.27	.660	52
Participating Orgs Shared	4.21	.776	52
Participants Cooperated	4.10	.846	52
Made Space For People	3.90	1.089	52
Communication Channels Were Open	4.00	.808	47
Mistakes Were Opps For Learning	3.87	.797	47
Learned While Doing	3.85	1.383	47
Researched Who Was Doing	3.43	1.281	47
Allowed Others To Solve	3.34	1.238	47
Principles Proven Effective	3.94	.676	51
Created New Things	3.39	1.250	51
Helped Consider Options	3.65	1.262	51
Relished Opps For Creativity	3.31	1.288	51
Orgs Were Creative	3.76	.907	51
Went Beyond Self Interest	3.69	1.130	54
Participants Trusted	4.09	.591	54
Used Data	3.93	1.163	54
Were Trusted	3.43	1.161	54
Participants Sought	3.87	.962	53
People Impacted	3.72	1.150	53
As A Team Compassionate	3.79	1.321	53
Not Afraid To Share	3.58	1.184	53
Made Decisions After	3.43	1.435	53
Participants Were Knowledgeable	4.34	.935	54
Programs In Participating	3.65	.828	54
Participants Sustained Current Knowledge	4.22	.760	54
Addressed Basic Ideas And Basic	3.74	1.085	54
Were Well Trained In Their Areas	3.80	1.379	54
Participants Continuously Looked For Ways	4.11	.725	53
As A Team Consistently Connected	3.38	1.147	53
Sought To Build Understanding	3.79	1.246	53
Sought Change	2.89	1.311	53
Used Critical Analysis	3.68	1.298	53

Specified The Importance Of Having	3.81	1.290	54
Held Others Accountable	3.44	1.176	54
Practiced Stewardship	3.48	1.328	54
A Set Of Principles Emerged	3.56	1.383	54
Provided Safe Spaces	3.61	1.280	54

Principle axis factor extractions with oblique rotation (direct oblimin) were performed through SPSS. The tests partially supported Hypothesis 1. Hypotheses 1b, 1c, 1d, 1f, 1g, 1h, 1i, 1j, and 1k were supported: With a cutoff of 0.5 for inclusion of a variable in interpretation of a factor, all variables loaded on one factor. Hypotheses 1a and 1e were partially supported; in the Catalyze Change theme, one variable of the five loaded into a second factor. In the Continual Learning theme, all five factors loaded into one factor, however the communality for one of the variables was quite low. More detail of the Catalyze Change and Continual Learning factor analyses are provided below.

Eigenvalues ranged from 2.886 (Connectedness) to 7.696 (Stewardship), and explained a range of variance from 70.630% (Collective Identity) to 92.046% (Stewardship). Communality values within each theme, as seen in Table 3 below, tended to be high, with the exception of one variable in the Catalyze Change theme and one variable in the Continual Learning theme (see below for more details). The high correlations of the variables within each theme indicates homogeneity of items on the instrument. Each theme had high reliability, with Cronbach's α ranging from .812 (Comfort With Complexity) to .987 (Connectedness). When oblique rotation was selected, loadings of the variables on the factor (theme), communalities, and percents of variance and covariance are summarized in Table 4 below.

Table 4. *Summary of exploratory factor analysis results for all themes of DE leadership characteristics.*

Theme	Item	Rotated Factor	h^{2*}
Catalyze Change			
	Shared Visions	.836	.700
	Experts Challenged	.950	.902
	Spent Time Teaching	.953	.909
	Asked Probing Questions	.958	.918
Eigenvalue		3.928	
Percent of variance		87.986	
α		.927	
N = 53			
Collective Identity			
	Team members were open	.730	.533
	It felt as if team oriented	.796	.634
	Participants had a sense of ownership	.868	.753
	How work contributed was important	.833	.694
	Shared a common story	.958	.918
Eigenvalue		3.532	
Percent of variance		70.630	
α		.976	
N = 52			
Comfort With Complexity			
	I understood the value	.801	.641
	As a team sought engagement	.982	.964
	Provided the necessary time	.875	.766
	Looked for connections	.868	.753
	Demonstrated comfort	.973	.947
Eigenvalue		5.793	
Percent of variance		83.436	
α		.812	
N = 54			
Connectedness			
	Orgs see themselves	.897	.805
	Many experiences were shared	.847	.718
	Participating orgs shared	.916	.839
	Participants cooperated	.881	.776
	Made space for people	.887	.786
Eigenvalue		2.886	
Percent of variance		78.840	
α		.987	
N = 54			

(Table continues on next page)

Table 4. *Summary of exploratory factor analysis results for all themes of DE leadership characteristics* (continued).

Theme	Item	Rotated Factor	h^{2*}
Continual Learning			
	Communication channels were open	.670	.449
	Learned while doing	.917	.842
	Researched who was doing	.975	.951
	Allowed others to solve	.767	.589
Eigenvalue		4.323	
Percent of variance		75.387	
α		.941	
N = 52			
Creativity			
	Principles Proven Effective	.685	.469
	Created New Things	.973	.947
	Helped Consider Options	.977	.955
	Relished Opps For Creativity	.947	.897
	Orgs Were Creative	.932	.868
Eigenvalue		5.419	
Percent of variance		88.892	
α		.966	
N = 51			
Credibility			
	Went Beyond Self Interest	.963	.928
	Participants Trusted	.747	.557
	Used Data	.909	.977
	Were Trusted	.935	.947
Eigenvalue		3.676	
Percent of variance		84.962	
α		.953	
N = 54			
Cultural Awareness			
	Participants Sought	.858	.737
	People Impacted	.956	.915
	As A Team Compassionate	.970	.941
	Not Afraid To Share	.846	.715
	Made Decisions After	.963	.927
Eigenvalue		6.442	
Percent of variance		86.458	
α		.941	
N = 53			

(Table continues on next page)

Table 4. *Summary of exploratory factor analysis results for all themes of DE leadership characteristics* (continued).

Theme	Item	Rotated Factor	h^{2*}
Content Knowledge			
	Participants Were Knowledgeable	.901	.812
	Program In Participating	.800	.639
	Participants Sustained Current Knowledge	.880	.774
	Addressed Basic Ideas And Basic	.917	.840
	Were Well-trained In Their Areas	.930	.864
Eigenvalue		4.327	
Percent of variance		81.034	
α		.921	
N = 54			
Sensemaking			
	Participants Continuously Looked For Ways	.831	.691
	As A Team Consistently Connected	.960	.922
	Sought To Build Understanding	.936	.876
	Sought Change	.870	.756
	Used Critical Analysis	.978	.957
Eigenvalue		5.847	
Percent of variance		86.046	
α		.851	
N = 53			
Stewardship			
	Specified The Importance Of Having	.923	.853
	Held Others Accountable	.943	.889
	Practiced Stewardship	.983	.966
	A Set Of Principles Emerged	.955	.912
	Provided Safe Spaces	.989	.977
Eigenvalue		7.696	
Percent of variance		92.046	
α		.950	
N = 54			

Catalyze Change. A principle axis factor extraction with oblique rotation (direct oblimin) was performed through SPSS on 5 items from the *Catalyze Change* theme on the instrument from a sample of 53 respondents. The Kaiser-Meyer-Olkin (KMO) measure verified the sampling adequacy for the analysis (KMO=.828), and all KMO values for the individual items were greater than .812, well above the acceptable level of .5 (Field, 2013), with the exception of the variable *Facilitated Problem Solving*, with a

KMO level of .269. This is the only EFA test that extracted two factors. After rotation, *Shared Visions* loaded at .798, *Experts Challenged* at .944, *Spent Time Teaching* at .960, and *Asked Probing* at .990. However, *Facilitated Problem Solving* loaded at -.005.

When the variable *Facilitated Problem Solving* was omitted (Field, 2013), the Kaiser-Meyer-Olkin measure remained adequate for measuring sample adequacy (KMO=.871), and all KMO values for the individual items were greater than .841, well above the acceptable level of .5 (Field, 2013). An initial analysis was run to obtain eigenvalues for the factor. The eigenvalue was 3.928 and explained 87.986% of the variance.

Communality values, as seen in Table 2 below, tended to be high. With a cutoff of 0.5 for inclusion of a variable in interpretation of a factor, all variables loaded on one factor. The high correlations of the four variables indicates homogeneity of items on the instrument. When oblique rotation was selected, loadings of the variables on the factor (theme), communalities, and percents of variance and covariance are shown in the Table below.

The Catalyze Change subscale had a high reliability, Cronbach's $\alpha = .927$.

Continual Learning. A principle axis factor extraction with oblique rotation (direct oblimin) was performed through SPSS on 5 items from the *Continual Learning* theme on the instrument from a sample of 52 respondents. The Kaiser-Meyer-Olkin (KMO) measure verified the sampling adequacy for the analysis (KMO=.657), and all KMO values for the individual items were greater than .594, above the acceptable level of .5 (Field, 2013), with the exception of the variable *Mistakes Were Opportunities for Learning*, with a KMO level of .412. This variable had seven missing responses.

When the variable *Mistakes Were Opportunities for Learning* was omitted (Field, 2013), the Kaiser-Meyer-Olkin measure remained adequate for measuring sample adequacy (KMO=.797), and all KMO values for the individual items were greater than .712, well above the acceptable level of .5 (Field, 2013). An initial analysis was run to obtain eigenvalues for the factor. The eigenvalue was 4.323 and explained 75.387% of the variance. The Table below shows the factor loading after rotation.

Communality values, as seen in Table below, tended to be high. With a cutoff of 0.5 for inclusion of a variable in interpretation of a factor, all variables loaded on one factor. The high correlations of the four variables indicates homogeneity of items on the instrument. When oblique rotation was selected, loadings of the variables on the factor (theme), communalities, and percents of variance and covariance are shown in Table 6.

The Continual Learning subscale had a high reliability, Cronbach's $\alpha = .941$.

Integration of Data

The qualitative results sought to find the leadership characteristics of DE in order to compare them to the leadership characteristics in CLT. Once the qualitative data was interpreted, they were used to inform the quantitative strand. Interview questions were designed to solicit information regarding what key informants in DE—DE Coaches—thought were leadership characteristics based, initially, on *a priori* characteristics in CLT; emergent leadership characteristics were pulled from the data as well. Statements in the interviews related to the *a priori* themes of leadership characteristics and emergent themes were used to develop a scaled-question instrument based on several existing scaled-questions instruments.

The quantitative instrument was used to verify the findings from the qualitative results, using factor analysis. It was found that leadership characteristics of DE correlate strongly with the leadership characteristics identified in the CLT literature. In addition, five emergent characteristics were found in DE that could add new perspectives to CLT.

Chapter 5: Discussion

This study examines the leadership characteristics in Developmental Evaluation to help determine whether Complexity Leadership Theory can be used as a model to study leadership in DE. The leadership characteristics for DE were elicited from key informants through a qualitative survey based on CLT leadership characteristics. Five additional themes emerged, which may prove beneficial to further study of CLT. A scaled survey was then developed using the results of the qualitative survey

A strong correlation between the leadership characteristics of DE and CLT was found, and DE was shown to highlight additional leadership characteristics not currently considered in CLT. Adding the emergent leadership characteristics found in DE could make CLT more robust when responding to complex adaptive circumstances.

Limitations

While these findings are significant in the study of leadership in both CLT and DE, further study is recommended. Several limitations of this study are noted in order to strengthen continued research.

Although the use of incentives may increase the number of responses, at this time the population of organizations selected for the quantitative survey is the only population known to practice DE. As more organizations and networks of organizations practice DE, it is hoped researchers can become aware of them and encourage their participation in a survey in which the sample size becomes sufficient to conduct a full exploratory factor analysis. Evaluators and practitioners of systemic approaches to resolving intractable social problems are frequently engaged in DE without having a recognizable name for what they are doing (Patton, 2016). Several of this study's key informants

noted that there are organizations that practice DE without realizing it; therefore, the sample size may also be increased by conducting a thorough search of the literature for practitioners of DE who are unaware of the Developmental Evaluation process or that they are applying it.

Member checks on both the qualitative and quantitative instruments could be expanded. This researcher chose to prioritize low expense over additional expertise and the study reflects a trust in drawing questions from previously validated-leadership characteristic identification surveys. Researchers with access to funding that may increase response rates may find the opportunity to place more resources into instrument development.

As in any survey, research subjects in both the qualitative and quantitative strands of this study may have been susceptible to bias because of attachment to the issue being tested, particularly when rating (or assuming to rate) themselves. They may have recalled past actions inaccurately or provided more favorable information about their organization or network than is accurate (Kahneman, 2011). Some participants may simply have had inaccurate or divergent recollections, which could cause differences in responses and inaccurate emphases. The nonrandom approach to sampling in the quantitative strand—targeting participants of DE—may have biased a response from those who have an interest in the issue. Still, this approach is the best way of recruiting respondents with the knowledge of DE to make observations about leadership characteristics.

Finally, while most of the fifty-four variables loaded into the factors expected, two factors did not load as expected. The variables for Catalyze Change loaded into two

factors; four variables were extracted into the Catalyze Change factor, while Facilitated Problem Solving loaded into a different factor. Further research is suggested to determine why this occurred. Although all five variables loaded into the Continual Learning factor, one variable, Mistakes Were Opportunities for Learning, exhibited unexpectedly low communalities. As suggested (Field, 2013), a factor analysis was conducted without Mistakes Were Opportunities for Learning.

Delimitations

The knowledge of the DE coaches could prove to be both a limitation and strength (Kumar, Stern & Anderson, 1993)—a limitation on diversity of perspectives about DE, and a strength because of their knowledge about DE.

The quantitative survey could be conducted using entirely different or all the data from the qualitative findings. I tried to select questions that would be easily understandable to survey respondents. The selection of questions reflects my own bias, however that bias could be argued to be that of an expert, given my positioning with DE. I also limited the number of questions in the quantitative survey in an effort to increase the number of responses.

The sample size for both strand are small, limiting generalizability. However, the results provide direction to future researchers who might find access to larger samples. Also, data was not collected over several time periods, so I cannot measure any possible changes in perception of outcomes as the use of DE grows.

An important aspect of complexity, and of developmental evaluation, is continuous learning through feedback loops (Hazy & Uhl-Bien, 2012). This includes, but is not limited to, reflection (Patton, 2011). Developmental Evaluation lends itself well to

study. By including reflection and institutionalizing feedback loops and learning behavior in its processes, practitioners become conditioned to participating in feedback and learning. Individuals who have experience in developmental evaluation have practice in reflection, including reflection on leadership issues.

Implications and Significance

Until now, there has not been a generalizable method of measuring complex adaptive leadership in practical settings. This study created two instruments, one qualitative and one quantitative, that can be utilized to measure leadership characteristics in DE. Based on the leadership characteristics in CLT, these instruments can be used to identify whether a DE initiative has the leadership resources needed to operate effectively in complex adaptive systems.

Advancing Leadership in Applied Settings of Complex Adaptive Systems. For DE practitioners and coaches, these tools can move their initiatives forward to be better prepared to bond, adapt and coevolve as they maneuver through dynamic, highly networked environments. Practitioners can use these tools to understand what leadership assets are available to them, where learning should be focused, how to make effective use of connections, and how to function better as a team.

Merging of Theory and Application. Another important outcome of this study is demonstrating the alignment of DE leadership characteristics with those of CLT, providing a way to empirically study CLT and a mechanism to evaluate leadership in complex adaptive systems in an applied setting. The continual learning and adaptation in DE could prove challenging to researchers, yet have powerful impacts on incorporating leadership theory to practice. Many practitioners still regard the study of leadership

theory as only distantly relevant to practice; involving practitioners could bring theory closer to practice, a union that could accelerate theory development, particularly since five new themes of leadership in complex adaptive systems emerged from this study Such acceleration could advance a recognition of nonprofit organizations, and especially the networks within which they operate, as complex adaptive systems worthy of more discerning study (rather than trying to fit these systems into less complex—and less appropriate—models). Theory development, in turn, could revise the way nonprofit organizations approach their issues of concern. In a time of shifting sectoral boundaries, in which the nonprofit, public, and market sectors increasingly overlap (Salamon, 2012), this might give the nonprofit sector renewed impetus to collaborate on intractable social problems.

Advancing CLT in Applied Settings. Uhl-Bien, Marion, and McKelvey (2007) note that by framing leadership as a complex interactive dynamic from which organizational learning, adaptability, and innovation emerge, CLT helps organizations and networks become more effective in complex adaptive systems. As organizations interact and evolve, leadership must keep pace and encourage coevolution to achieve and sustain high performance (Child & McGrath, 2001). Social assets in such settings become increasingly important. This creates the challenge of coordinating networked assets rather than directing hierarchical or transactional interactions (Miles, Snow, Matthews, & Miles, 1999). Organizations increase performance in complex adaptive systems by learning to meet complex situations with complex responses (McKelvey & Boisot, 2003).

Using leadership characteristics of CLT as *a priori* dimensions can prove to be an asset as a framework to study DE leadership. Leadership in complex adaptive systems is less controlling and more facilitating and coordinating (Hazy& Uhl-Bien, 2012). Marion and Uhl-Bien (2002) explain that in complex adaptive systems participatory leadership models such as CLT are necessary to enable organizational effectiveness. Such models reduce oversimplification and provide links to emergent strategies and shared knowledge. They enable innovation by influencing, not controlling, networks, because controlling dynamic networks over a long period of time reduces effectiveness. This shift from control to influence in complex leadership facilitates innovation and helps organizations and their networks operate in ways that increase participation.

CLT Representation in Applied Complex Adaptive Systems. Marion and Uhl-Bien (2002) further explain that the inclusive CLT model reduces the kinds of externalities that hinder meaningful exchange within organizations and their networks. A controlling type of leadership is limited to the knowledge and abilities of the leader. A type of leadership, such as that modeled in CLT, that relies primarily on participation and influencing rather than controlling incorporates the knowledge of all parts of a system. It highlights the complexity concept of interdependence, rather than dependency. As Lichtenstein et al. (2006) note, CLT reflects the complexity of the real world, making it a valuable tool for studying leadership in applied situations.

Advancing Research in CLT. Findings of significant similarities between Complexity Leadership Theory and the practice of Developmental Evaluation opens the door for practical research into leadership in complex adaptive systems. CLT leadership characteristics are clearly identified in the current CLT models; and the leadership

characteristics in DE have been found in this study to correlate closely to those in CLT. This offers a useful and practical way for researchers to test Complexity Leadership Theory in complex networks. Until now, CLT has been verified and studied almost entirely through computer models and two single-case studies. The ability to study a population now provides opportunities to see what actually effects leadership in complex adaptive systems, how often, and under what conditions. This opens the path to applied meaning of CLT, providing a means to practice and assess it further. In other words, CLT becomes more than just a theory.

DE practitioners can be important participants in field research of CLT. DE is very much a participatory evaluation process, and from this participatory perspective might emerge new aspects to leadership studies. Indeed, this study uncovered new leadership themes in complex adaptive systems not previously identified in CLT: Credibility, Cultural Awareness, Content Knowledge, Sensemaking, and Stewardship. Adding these themes of leadership to the CLT model provides an opportunity to make the model more robust.

Greater Impact on Seemingly Intractable Issues. A better understanding of operating within complex adaptive systems is likely to make supporting, working, volunteering, and leading in the nonprofit sector more relevant and meaningful, knowing that complex social problems can receive more meaningful responses. The knowledge gained from further research can shift the paradigm in how seemingly intractable problems can be resolved.

Concluding Remarks

Developmental Evaluation practitioners acknowledge the complexity of change. Complexity Leadership Theory was developed to explain and explore leadership in adaptive, interconnected, overlapping, and co-evolving circumstances. Theory is intended to improve application, and Complexity Leadership Theory can add to the knowledge of leadership in Developmental Evaluation.

True to the co-evolutionary property complexity, Development Evaluation can improve Complexity Leadership Theory as well; for example, as this study demonstrates, Developmental Evaluation adds five new themes of leadership characteristics to Complexity Leadership Theory. Applied settings can help advance the theory, and Developmental Evaluation practitioners, steeped in complexity, are especially well-suited to co-evolve theory and application.

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Appendix 1

Semi-structured Interview Question Guide

1. What experiences led you to become a DE coach? How many separate opportunities have you had to serve as a DE coach?
2. [Questions 1a through 1c will be used only if needed to help open up respondents into a conversation.]
    a. What have been some of the highlights of your coaching experience(s)?
    b. What were (are) the primary social issues being addressed, and how were (are) strategies selected?
    c. In preparing for your role as a Developmental Evaluation Coach what did you learn that you used (are using)? What, if anything, happened during your coaching that the preparation did not prepare you for?
3. What challenges did you have to overcome? How were these met? Were goals/increments clear?
4. How were controversies within the DE network resolved? Did any novel ideas arise?
5. Can you describe the leadership of the DE network; what were (are) the characteristics of the leadership that you noticed? Was (Is) leadership fairly stable or did (do) different people take leadership at various times? If different people took leadership roles, did challenges arise because of that?
6. Were outside experts brought in to the DE network for the short term to provide advice or guidance? What role(s) did they play?

7. What progress has been made on the primary social issue of the DE network?

   Has the primary issue changed?

8. What else is important to tell me about the project and the DE network?

Appendix 2

Quantitative Strand Instrument

Web Consent Form:

You are being asked to participate in a research study conducted by Terry Fernsler, Ph.D. student from James Madison University. The purpose of this study is to learn about leadership characteristics in Developmental Evaluation from your observations.

Research Procedures

This study consists of an online survey that will be administered to individual participants using Qualtrics (an online survey tool). You will be asked to provide answers to a series of questions related to your observations while participating in Developmental Evaluation.

Time Required

Participation in this study will require approximately 20 minutes of your time.

Risks

The investigator does not perceive more than minimal risks from your involvement in this study (that is, no risks beyond the risks associated with everyday life).

Benefits

No individual benefits will accrue unless you request final aggregate results. Final aggregate results may result in learning new ways your organization approaches intractable social initiatives. If leadership characteristics in CLT and DE strongly correlate, the ability to study a population will offer opportunities to see what variables actually have effects on leadership in complex adaptive systems, how often, and under what conditions. This could give CLT more applied meaning and provide a means to practice and assess it.

Confidentiality

The results of this research will be presented for publication in peer-reviewed journals and presentation at conferences. While individual responses are anonymously obtained and recorded online through the Qualtrics software, data is kept in the strictest confidence. No identifiable information will be collected from the participant and thus, no identifiable responses will be presented in the final form of this study. All data will be stored in a secure location only accessible to the researcher and his faculty advisor. The researcher retains the right to use and publish non-identifiable data. At the end of the study, all records will be destroyed. Final aggregate results will be made available to participants upon request.

Participation & Withdrawal

Your participation is entirely voluntary. You are free to choose not to participate. Should you choose to participate, you can withdraw at any time without consequences of any kind. However, once your responses have been submitted and anonymously recorded you will not be able to withdraw from the study.

Questions about the Study

If you have questions or concerns during the time of your participation in this study or after its completion, or you would like to receive a copy of the final aggregate results of this study, please contact:

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Questions about Your Rights as a Research Subject may be addressed to

Dr. David Cockley
Chair, Institutional Review Board
James Madison University
(540) 568-2834
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Giving of Consent

I have been given the opportunity to ask questions about this study. I have read this consent and I understand what is being requested of me as a participant in this study. I certify that I am at least 21 years of age. By clicking on the link below, and completing and submitting this anonymous survey, I am consenting to participate in this research.

Agree

The link to the survey is http://jmu.co1.qualtrics.com/jfe/form/SV_1MKtHLPGtncz8Xz

Quantitative Questions / Developmental Evaluation

Please think of a Developmental Evaluation project in which you/your organization participated. If it is a current project, substitute the present tense for past-tense statements. **If an item is irrelevant, or if you are unsure or do not know the answer, leave the answer blank.**

Some Developmental Evaluation projects are conducted among multiple organizations, some among teams (or departments or divisions) within one organization. In this survey, the term "participants" refers to organizations in an inter-organizational project and teams (divisions, departments, etc.) in intra-organizational projects.

In the Developmental Evaluation projects in which I participated. . .

	Strongly disagree	Disagree	Undecided	Agree	Strongly agree
1. Organizations often see themselves as part of a larger movement	1	2	3	4	5
2. Participants were knowledgeable about their field of practice	1	2	3	4	5
3. Organizations were creative in addressing concerns	1	2	3	4	5
4. Communication channels were open to allow for ongoing feedback and information sharing	1	2	3	4	5
5. Shared visions encouraged progress and change	1	2	3	4	5
6. I understood the value of experimentation and the learning that resulted from the process	1	2	3	4	5
7. Experts were challenged	1	2	3	4	5
8. Many experiences were shared among participating organizations	1	2	3	4	5
9. Programs in participating organizations were effective prior to joining the DE effort	1	2	3	4	5
10. Participating organizations shared many interests	1	2	3	4	5

11. Participants sustained current knowledge of their field of practice	1	2	3	4	5
12. Team members were open and honest with one another	1	2	3	4	5
13. Participants generally trusted each other	1	2	3	4	5
14. Participants sought differing perspectives when solving problems	1	2	3	4	5
15. It felt as if participants were team oriented	1	2	3	4	5
16. Participants operated from a spirit of cooperation rather than competition	1	2	3	4	5
17. Principles proven effective in one context were adapted for a different contest	1	2	3	4	5
18. Participants continuously looked for ways to improve processes and services	1	2	3	4	5
19. People impacted by change were actively involved in shaping the desired future	1	2	3	4	5
20. Participants had a sense of ownership	1	2	3	4	5
21. Mistakes were viewed as opportunities for learning	1	2	3	4	5

Rate Developmental Evaluation participants on the following questions:

	Strongly disagree	Disagree	Undecided	Agree	Strongly agree
22. How work contributed to the success of the project was more important than individual organization or team success	1	2	3	4	5
23. Facilitated problem-solving rather than taking charge of the answers	1	2	3	4	5

24. As a team, consistently connected the dots	1	2	3	4	5
25. Spent time teaching and coaching each other	1	2	3	4	5
26. Made space for people to express themselves	1	2	3	4	5
27. Went beyond self-interest for the good of the group	1	2	3	4	5
28. Specified the importance of having a strong sense of purpose	1	2	3	4	5
29. As a team, participants were compassionate	1	2	3	4	5
30. Created things no one had thought of before	1	2	3	4	5
31. Learned while doing	1	2	3	4	5
32. As a team, sought engagement with a lot of partners	1	2	3	4	5
33. Helped people consider new options when they seem stuck	1	2	3	4	5
34. Addressed basic ideas and basic questions	1	2	3	4	5
35. Provided the necessary time and support for systemic, long-term change	1	2	3	4	5
36. Sought to build understanding among each other	1	2	3	4	5
37. Held others accountable for their commitments	1	2	3	4	5
38. Researched who was doing something similar to the project	1	2	3	4	5
39. Sought change, but not necessarily consciously	1	2	3	4	5
40. Used critical analysis	1	2	3	4	5
41. Shared a common story	1	2	3	4	5

42. Asked probing, open-ended questions to help each other uncover their best thinking	1	2	3	4	5
43. Were well-trained in their areas of expertise	1	2	3	4	5
44. Relished opportunities to be creative	1	2	3	4	5
45. Used data/information to inform their decision-making	1	2	3	4	5
46. Looked for connections	1	2	3	4	5
47. Practiced stewardship	1	2	3	4	5
48. A set of principles emerged from the process of working together	1	2	3	4	5
49. Not afraid to share their opinions even if those opinions were different from the majority	1	2	3	4	5
50. Provided safe spaces for discussion	1	2	3	4	5
51. Made decisions after considering the input of those affected	1	2	3	4	5
52. Allowed others to discover new ways of solving problems	1	2	3	4	5
53. Were trusted by most or all	1	2	3	4	5
54. Demonstrated comfort with complexity	1	2	3	4	5

Appendix 3

Scaled Questions Responses

Theme	Question	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total Responses
Catalyze Change	Shared visions encouraged progress and change	0	2	5	19	28	54
Catalyze Change	Experts were challenged	0	5	7	22	19	53
Catalyze Change	Facilitated problem-solving rather than taking charge of the answers	5	5	15	19	10	54
Catalyze Change	Spent time teaching and coaching each other	5	7	10	22	10	54
Catalyze Change	Asked probing, open-ended questions to help each other uncover their best thinking	5	0	12	15	22	54
Collective Identity	Team members were open and honest with one another	0	0	5	335	14	54
Collective Identity	It felt as if participants were team oriented	0	2	7	26	19	54
Collective Identity	Participants had a sense of ownership	0	2	5	24	22	53
Collective Identity	How work contributed to the success of the project was more important than individual organization or team success	5	5	8	27	7	53
Collective Identity	Shared a common story	7	7	5	23	12	54
Comfort with Complexity	I understood the value of experimentation and the learning that resulted from the process	0	0	0	14	40	54
Comfort with Complexity	As a team, sought engagement with a lot of partners	5	5	5	24	15	54
Comfort with Complexity	Provided the necessary time and support for systemic, long-term change	7	15	10	10	12	54
Comfort with Complexity	Looked for connections	7	5	5	12	25	54
Comfort with Complexity	Demonstrated comfort with complexity	2	7	5	25	15	54
Connec-tedness	Organizations often see themselves as part of a larger movement	0	5	0	29	19	53
Connec-tedness	Many experiences were shared among participating organizations	0	2	0	32	18	52
Connec-tedness	Participating organizations shared many interests	0	3	2	28	21	54
Connec-tedness	Participants operated from a spirit of cooperation rather than competition	0	2	10	21	21	54
Connec-tedness	Made space for people to express themselves	2	7	0	28	17	54
Continual Learning	Communication channels were open to allow for ongoing feedback and information sharing	0	2	9	23	19	53
Continual Learning	Mistakes were viewed as opportunities for learning	0	3	9	26	9	47
Continual Learning	Learned while doing	7	2	0	20	25	54
Continual Learning	Researched who was doing something similar to the project	7	5	2	30	10	54
Continual Learning	Allowed others to discover new ways of solving problems	5	10	1	26	10	52

Theme	Question	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total Responses
Creativity	Principles proven effective in one context were adapted for a different contest	0	0	13	28	10	51
Creativity	Created things no one had thought of before	7	5	7	25	10	54
Creativity	Helped people consider new options when they seem stuck	5	5	7	20	17	54
Creativity	Relished opportunities to be creative	5	12	5	20	12	54
Creativity	Organizations were creative in addressing concerns	0	7	7	28	12	54
Credibility	Went beyond self-interest for the good of the group	2	7	12	18	15	54
Credibility	Participants generally trusted each other	0	0	7	35	12	54
Credibility	Used data/information to inform their decision-making	5	2	2	28	17	54
Credibility	Were trusted by most or all	5	7	7	28	7	54
Cultural Awareness	Participants sought differing perspectives when solving problems	0	7	7	26	14	54
Cultural Awareness	People impacted by change were actively involved in shaping the desired future	0	14	2	22	15	53
Cultural Awareness	As a team, participants were compassionate	5	5	7	15	21	54
Cultural Awareness	Not afraid to share their opinions even if those opinions were different from the majority	5	5	7	26	11	54
Cultural Awareness	Made decisions after considering the input of those affected	7	10	5	15	17	54
Content Knowledge	Participants were knowledgeable about their field of practice	0	5	2	16	31	54
Content Knowledge	Programs in participating organizations were effective prior to joining the DE effort	0	5	16	26	7	54
Content Knowledge	Participants sustained current knowledge of their field of practice	0	2	5	26	21	54
Content Knowledge	Addressed basic ideas and basic questions	2	7	7	25	13	54
Content Knowledge	Were well-trained in their areas of expertise	7	5	0	22	20	54
Sense-making	Participants continuously looked for ways to improve processes and services	0	2	5	31	15	53
Sense-making	As a team, consistently connected the dots	5	7	10	25	7	54
Sense-making	Sought to build understanding among each other	5	5	2	25	17	54
Sense-making	Sought change, but not necessarily consciously	7	21	2	17	7	54
Sense-making	Used critical analysis	5	5	10	15	19	54
Steward-ship	Specified the importance of having a strong sense of purpose	7	2	2	26	17	54
Steward-ship	Held others accountable for their commitments	7	2	12	26	7	54
Steward-ship	Practiced stewardship	7	7	5	23	12	54
Steward-ship	A set of principles emerged from the process of working together	5	12	2	18	17	54
Steward-ship	Provided safe spaces for discussion	5	7	7	20	15	54

Appendix 4

Joint Display Table: Quantitative Question, Variable, Statistical Measures and Data Integration

Qualitative theme	Quantitative question	Variable name	Statistical measures	Integration of data
Catalyze change	Shared visions encouraged progress and change	Shared visions	$\alpha = .927$ $h^{2*} = .700$	*a priori* theme found important. Reduced to two factors, with four variables in one factor and one variable in the second factor.
	Experts were challenged	Experts challenged	$h^{2*} = .902$	
	Facilitated problem solving rather than taking charge of the answers			
	Spent time teaching and coaching each other	Spent time teaching	$h^{2*} = .909$	
	Asked probing, open-ended questions to help each other uncover their best thinking	Asked probing	$h^{2*} = .918$	
Collective identity	Team members were open and honest with each other	Team members were open	$\alpha = .976$ $h^{2*} = .730$	*a priori* theme found important. Reduced to one factor as predicted.
	It felt as if participants were team oriented	It felt as if team oriented	$h^{2*} = .796$	
	Participants had a sense of ownership	Participants had a sense of ownership	$h^{2*} = .868$	
	How work contributed to the success of the project was more important than individual organization or team success	How work contributed was important	$h^{2*} = .833$	
	Shared a common story	Shared a common story	$h^{2*} = .958$	

Qualitative theme	**Quantitative question**	**Variable name**	**Statistical measures**	**Integration of data**
Comfort with complexity	I understood the value of experimentation and the learning that resulted from the process	I understood the value	α = .812 h^{2*} = .801	*a priori* theme found important. Reduced to one factor as predicted.
	As a team, sought engagement with a lot of partners	As a team sought engagement	h^{2*} = .982	
	Provided the necessary time and support for systemic, long-term change	Provided the necessary time	h^{2*} = .875	
	Looked for connections	Looked for connections	h^{2*} = .868	
	Demonstrated comfort with complexity	Demonstrated comfort	h^{2*} = .973	
Connectedness	Organizations often see themselves as part of a larger movement	Orgs see themselves	α = .987 h^{2*} = .897	*a priori* theme found important. Reduced to one factor as predicted.
	Many experiences were shared among participating organizations	Many experiences were shared	h^{2*} = .847	
	Participating organizations shared many interests	Participating orgs shared	h^{2*} = .916	
	Participants operated from a spirit of cooperation rather than competition	Participants cooperated	h^{2*} = .881	
	Made space for people	Made space for people	h^{2*} = .887	

	to express themselves			
Qualitative theme	**Quantitative question**	**Variable name**	**Statistical measures**	**Integration of data**
Continual learning	Communication channels were open to allow for ongoing feedback and information sharing	Communication channels were open	α = .941 h^{2*} = .670	*a priori* theme found important. Reduced to one factor as predicted.
	Mistakes were viewed as opportunities for learning	---		
	Learned while doing	Learned while doing	h^{2*} = .917	
	Researched who was doing something similar to the project	Researched who was doing	h^{2*} = .975	
	Allowed others to discover new ways of solving problems	Allowed others to solve	h^{2*} = .767	
Creativity	Principles proven effective in one context were adapted for a different contest	Principles proven effective	α = .966 h^{2*} = .685	*a priori* theme found important. Reduced to one factor as predicted.
	Created things no one had thought of before	Created new things	h^{2*} = .973	
	Helped people consider new options when they seem stuck	Helped consider options	h^{2*} = .977	
	Relished opportunities to be creative	Relished opps for creativity	h^{2*} = .947	
	Organizations were creative in addressing concerns	Orgs were creative	h^{2*} = .932	
Credibility	Went beyond self-interest for the good of	Went beyond self interest	α = .953 h^{2*} = .963	Reduced to one factor as predicted.

	the group			
Qualitative theme	**Quantitative question**	**Variable name**	**Statistical measures**	**Integration of data**
	Participants generally trusted each other	Participants trusted	$h^{2*} = .747$	
	Used data/information to inform their decision-making	Used data	$h^{2*} = .909$	
	Were trusted by most or all	Were trusted	$h^{2*} = .935$	
Cultural awareness	Participants sought differing perspectives when solving problems	Participants sought	$\alpha = .941$ $h^{2*} = .858$	Reduced to one factor as predicted.
	People impacted by change were actively involved in shaping the desired future	People impacted	$h^{2*} = .956$	
	As a team, participants were compassionate	As a team compassionate	$h^{2*} = .970$	
	Not afraid to share their opinions even if those opinions were different from the majority	Not afraid to share	$h^{2*} = .846$	
	Made decisions after considering the input of those affected	Made decisions after	$h^{2*} = .963$	
Content knowledge	Participants were knowledgeable about their field of practice	Participants were knowledgeable	$\alpha = .921$ $h^{2*} = .901$	Reduced to one factor as predicted.
	Programs in participating organizations were effective prior to joining the DE effort	Program in participating	$h^{2*} = .800$	

Qualitative theme	Quantitative question	Variable name	Statistical measures	Integration of data
	Participants sustained current knowledge of their field of practice	Participants sustained current knowledge	$h^{2*} = .880$	
	Addressed basic ideas and basic questions	Addresses basic ideas and basic	$h^{2*} = .917$	
	Were well-trained in their areas of expertise	Were well trained in their areas	$h^{2*} = .930$	
Sensemaking	Participants continuously looked for ways to improve processes and services	Participants continuously looked for ways	$\alpha = .851$ $h^{2*} = .831$	Reduced to one factor as predicted.
	As a team, consistently connected the dots	As a team consistently connected	$h^{2*} = .960$	
	Sought to build understanding among each other	Sought to build understanding	$h^{2*} = .936$	
	Sought change, but not necessarily consciously	Sought change	$h^{2*} = .870$	
	Used critical analysis	Used critical analysis	$h^{2*} = .978$	
Stewardship	Specified the importance of having a strong sense of purpose	Specified the importance of having	$\alpha = .950$ $h^{2*} = .923$	Reduced to one factor as predicted.
	Held others accountable for their commitments	Held others accountable	$h^{2*} = .943$	
	Practiced stewardship	Practiced stewardship	$h^{2*} = .983$	
	A set of principles emerged from the process of working together	A set of principles emerged	$h^{2*} = .955$	
	Provided safe spaces for discussion	Provided safe spaces	$h^{2*} = .989$	

Appendix 5
Triangulation
Leadership Characteristics Identified by Themes and Case Study

Theme	Case Study	Characteristic
Catalyzing Change	Arts and Community Funder	change they were influencing
	Collaborative Crop research	focus the work by asking questions about purpose, methods, context, and capacity
		guide decision-making about program implementation and improvement
		integrate the concepts into the work
		facilitate the creation and articulation of new frameworks and the integration of existing ones
		expects concrete and high-quality change over time
		when to step in and offer expertise or challenge the direction
		facilitate their transformation of information into knowledge, and knowledge into wisdom
	Creating Safety to Explore	responsive and adaptive processes
		identify and incorporate the needs of participants
		safe spaces
		implementing
		positively challenged team members
		adaptive facilitation
		Communication was improved
		contributed directly to improving the research process
		model's development, implementation and uptake
		ask questions that challenged and clarified assumptions
		develop and adapt the model of care
		enable integration as we went along
		Adaptive and informed facilitation
		Space and time to think and reflect
		Recognize abilities, achievements, and complexities
		Strengthen communication

	Monitor adaptation
	legitimacy to the fact that we could change the model
	framework and processes in which the team felt safe to explore and develop the model of care
	facilitated reflective practice and active learning
	enabled the recognition and utilization of all team member's skills, knowledge, experience, and abilities
	enabled a process that brought together the skills, experience, and expertise of all team members
	identify and build on people's strengths
	observe and respond constructively
Frontiers of Innovation	vertical alignment
	Horizontal networking
	sustainable funding
	patterns of success
Guiding Principles	illuminate, inform, and support
	short cycles of design, data collection, and evaluative synthesis and reflection
	commitment to change
	Theory of change elaboration
	Ask probing evaluation questions
	question assumptions
	interact with them about what is going on and the implications of their efforts
	support adaptation and development of the innovation
	develop the alternatives, attract the resources, and work toward the moment when the system tip
	catalyze collective leadership
	Elucidate how the change processes and results being evaluated involve innovation and adaptation
	approaches wicked problems through engagement, learning, and adaptation
	Timely feedback
	illuminate, inform, and support
	Focus on intended use by intended users
	Elucidate how the change

	processes and results being evaluated involve innovation and adaptation
	guide innovation, adaptation, and systems change strategies
	interpret
Maori Educational Success	far-reaching vision
	trusting people and building relationships
	Transparent, relational, and use-oriented
Ontario Ministry of Education	ongoing attention to expected results
	used a program theory
	allow the articulation of the evidence, experience, knowledge, and theory that inform the direction of the work
	develop models of inquiry
	take risks
	community of practice
	logic models
	agents of change
	adaptive, coherent, precise, and personalized
	model the fact that they are open to those conversations that challenge their ideas
	use logic modeling tools
	identify the places in which we need to change
	rapid response to a crisis or urgent need
	ongoing and intentional use of an ongoing logic-modeling process
Outcome Harvesting	describes the ideal changes
	outcome generally occurs some time--even years--after
	visionary
Patton/McKegg/Weipehana	Catalyzing systems change
	relationship-focused
	seeking to change a complex system
	just-in-time, in-the-moment decision making
	facilitated with meaningful involvement of primary intended users
	funder
	leadership...is actively helping to shape the initiatives
	the art of the nudge
	forces for change

		major social problems require action at the systems level
	People to People	pace
		immediate feedback it is able to provide
		continue and be sustained longer than the 2-year engagement
		adapt programs flexibly
	Practitioners Perspectives	transformative effect
		Perseverance and courage
		counselors
		must be nurtured and developed
		perseverance
		facilitated and created opportunities for multiple perspectives to be heard and to contribute to
		defining evaluation activities
	Principles-focused Developmental Evaluation	building trust
		engaged at every decision point
	Vibrant Communities	insights into (and empathy for)
		ambitious
		aligning, not standardizing
		effectively orchestrate
Collective identity	Arts and Community Funder	community of practice
		share resources and knowledge
		made sense of things together
		develop a more adaptive team culture
		engagement
	Challenge Scholars	representation
	Collaborative Crop research	equity
		Communicating and returning analysis to stakeholders at all levels
		unflagging ally and committed partner
		working together and understanding how decision making takes place
		effective communication strategy
		relationships based on trust and a shared vision
		celebrate our successes
		walk alongside our program colleagues
	Creating Safety to Explore	discussion
		address or clarify issues
		develop shared understandings
		effective teamwork
		strengthen the team's cohesiveness

	effective communication across and beyond the team
	diversity within the team
	each team member contributed to developing and adapting the model of care
	strengthened the team's effectiveness
	trusted
	Develop deeper, shared understandings
	Harness potential, skills, and knowledge of all team members
	Make informed, shared decisions
	strengthened the ability of the team
	use their knowledge and expertise to meet and adapt
	enabled the team members to disseminate information about the model of care
Guiding Principles	collaborator
	engaging with them
	collaborative co-creation
	interwoven, interdependent, iterative, and co-created
Maori Educational Success	collaborative
	participative
	collaboration
	Operational at different levls of the system
	Participative
	reciprocity and collaboration
	engage, listen, understand, and collaborate
	maintain the trustees' buy-in
	Working collaboratively
	Having transparent and open dialogue
	work in solidarity
Maori Sport Recreation	relational nature
	relational
Ontario Ministry of Education	recognition for its success while the work continues
	the commitment of all
	interact with each other "in particular contexts around specific tasks"
	identify the differentiated approaches in various parts of the organization
	building a culture
Patton/McKegg/Weipehana	facilitated with meaningful

		involvement of primary intended users
	People to People	reconciliation process
		change the way people work together
	Practitioners Perspectives	wanted to know what other people were doing
		disclose their vulnerabilities
		roles as facilitators
		negotiators
		reconciliators
		film maker
		transfer of skills and evaluative capabilities
		thinking and practice are shared
		transferred
		integrated
		Data collection, reporting, and sense making are timed to meet the needs of key stakeholders
		many revisions to design and deliverable products
		ongoing buy-in of the trustees
		account of and managed the power dynamics
		Multiple perspectives authentically involved
		engagement
		collective experience in a team
		negotiating evaluation budgets, and unconventional timeframes for deliverables
	Principles-focused Developmental Evaluation	sharing and exploring
		co-creating a shared vision
		collective identity
Comfort with complexity	Arts and Community Funder	complexity
		be willing to allow it to change and form on its own
	Challenge Scholars	complexity
		pacing and framing
	Collaborative Crop research	self-determination
		conflict
		resilience
		when to sit back and let the process unfold
	Creating Safety to Explore	leap of faith
		manage the messiness and uncertainty
		talk honestly about issues that were considered "tricky"
		work to resolve these
		space to say, "Well, I don't know;

	I don't have the answer"
	flexibility
	agility
	sit comfortably with ambiguity
Guiding Principles	some knowledge of evaluation, innovation, complexity concepts, and systems thinking
	supports innovation, adaptation, and systems change
	supporting major systems change
	Understanding the challenges of innovation and systems change
	Pay particular attention to context and be responsive to changes as they occur
Maori Educational Success	Nothing was predetermined
Maori Sport Recreation	complexity
	flexibility of developmental evaluation for working with uncertainty and emergence
	emergence
	uncertainty
Ontario Ministry of Education	multidimensional picture
Patton/McKegg/Weipehana	Evaluating innovations in complex dynamic environments
	Unfolds in social systems that are inherently dynamic and complex
	preordained specificity don't work under conditions of uncertainty, turbulence, and emergence
	complex dynamic environment...clientele have changed
	Innovations...occurring in complex dynamic systems
	Thinking systemically
	systems change
	complexity concepts
	uncertainty
	dynamic
	ambiguity
	complexity
	Highly emergent and volatile situations
	Situations that are difficult to plan or predict because the variables and factors are interdependent and nonlinear
	Situations where multiple pathways forward are possible
	Socially complex situations
	Situations with unknown outcomes

	emergence, nonlinearity, dynamical, uncertainty, adaptability
	Treating a system as a unit of analysis...requires systems understandings and systems thinking
People to People	decentralized flexibility
	flexibility
	dynamic emergence
	focus on adaptability and flexibility
	recognizes the interconnections between different parts of the system
Practitioners Perspectives	diversity and emergence
	emergent
	advice is ongoing, iterative, rapid, and adaptive
	draw on many fields and disciplines
	systems and complexity science
	work adaptively
	cast a wide gate
	collecting other data from a wide range of potential perspectives and experiences
	timing of data collection, reporting, and sense making is driven by the needs of the initiative
	emergence of new and unexpected needs for data and information
	flexibility is not easy
	be able to renegotiate the scope and deliverables
	embrace unknowability
	embrace unknowability
	prepared for moments of uncertainty and ambiguity
Principles-focused Developmental Evaluation	judgment/intuitive
	ambiguity
	tolerance for ambiguity
	commitment to systems-level outcomes
Vibrant Communities	multiple and often overlapping evaluative processes
	comprehensive, multisectoral
	not possible to generalize
	acknowledged the complex nature
	overlapping ideas

		map out a strategy that had multiple, nonlinear elements
		multidimensional framework to tracking
Connectedness	Arts and Community Funder	develop collaborative relationships
		in partnership with others
		developing a network
		Engage
		an evolving network
	Challenge Scholars	build trust, partnership and capacity
	Collaborative Crop research	generative dialogue
		sustainability
		focus on expanding relationships more broadly
	Creating Safety to Explore	Effective relationships
		spreading the word
		ability to foster trusting relationships
	Frontiers of Innovation	shared learning
		Inside-outside collaboration
	Guiding Principles	works with networks of others to stimulate and take advantage of opportunities
		catalyze collective leadership
		know, understand, be able to work with, and adapt to the particular styles, approaches, and commitments of diverse social innovators
		negotiation
		actively engaging with social innovators
		attentive to interrelationships, perspectives, boundaries, and other key aspects of the social system and context
		all are essential
	Maori Educational Success	values-based
		dynamics of relationships
		advance Maori and Pacific Islander engagement
		Caring and respect
		trust
		courageous conversations
		diverse
		respecting and acknowledging
		affirming
		balance being both client- and project-facing
	Maori Sport Recreation	harness the collective knowledge
	Ontario Ministry of Education	collaborate

		collaborative inquiry
	Patton/McKegg/Weipehana	Developmental evaluation is a collaborative, interactive process
		multiple perspectives reflecting deeply
		thinking in terms of relationships
		collaboration among stakeholders from different organizations, systems, and/or sectors
		requesting qualifications and competencies
		supporting common spaces
	Practitioners Perspectives	transparent
		perspectives, boundaries, and interrelationships
		strategic and community advisors
		engage and collaborate with innovators
		willingly part with their knowledge
		values-based collaborative sense making
		Appreciation of the different needs of different stakeholders
		Relational trust
		honestly and respectfully engaging with perspectives, experiences, and viewpoints different from one's own
		communication
		trusted relationships are built
		strong ally
		trust
		Finding allies
		Deep, evaluative, collaborative sensemaking
		find allies
		prioritizing the building of trusted relationships
	Principles-focused Developmental Evaluation	if the principles are actually guiding action
		shared purposes
		trust
	Vibrant Communities	collaborating across organizations and sectors
		core principles
		Multisectoral collaboration
		Community asset building
		get diverse stakeholders to agree on the kinds of results they hoped to achieve
Continual learning	Arts and Community Funder	critical thinking
		reflective practice

	to learn
	internal-external hybrid
	be willing to allow it to change and form on its own
	careful observation
	reflection in which learning
	ongoing improvements and upgrades
	critical thinking
Challenge Scholars	balance between action and reflection
	learn
Collaborative Crop research	maximize our impact by generating insight and learning
	use the adaptive action framework
	way we approached it
	interpretation
	feedback, adapt, and revise
	aggregate...synthesize data
	Building M & E skills
	evaluation questions
	allows new thinking
	learns from its past
	a safe place to learn together, disagree, to try things and fail, wot work together to turn failure into success
Creating Safety to Explore	Reflection
	identify learnings
	stop and reflect
	spiral of learning
	interpreting information
	consider the implications of these differences
	Consider and interpret real-time data and feedback
	Increased understanding of how and why it works
	permission to change as we went along
Frontiers of Innovation	feedback
	action
	evolving scorecard
	sharpen, refine, and refresh our thinking
	A critical eye to what worked and what didn't work, and challenge community organizations to look at why
	reflective perspective
	The separation of evaluation space from decision space

	Rich feedback
	Reflection and reframing
	rapid adjustment
Guiding Principles	Working conclusions about what does and does not work
	evaluating a new, original approach to a problem as it is being created
	gather and make sense of data
	critical thinking, creative thinking, design thinking, inferential thinking, strategic thinking, and practical thinking
	Pay particular attention to context and be responsive to changes as they occur
	learning and behavior changes
	becoming more adept
	Deeper insight into the nature of the challenge being addressed
	probing
	build in regular ongoing opportunities for feedback, discussion, sense making, and adaptive decision making
	question assumptions
	analyze emergent findings
	inform ongoing adaptation
Maori Educational Success	creation of opportunities for mutual learning
	help them think critically
	pay attention
	focused attention
	balance
Maori Sport Recreation	reflection
	time to pause
Ontario Ministry of Education	"learn as we go" approach
	learning organization
	evidence-informed, focused improvement planning and implementation
	Learning
	Ongoing development, adaptation, and/or innovations new conditions
	need for performative development of programs
	adaptation of effective principles to new contexts
	integrating research, monitoring, evaluation, and capacity building
Outcome Harvesting	learning from what is emerging in order to continue developing

	collects evidence of what has been achieved, and works backward to determine whether and how the project or intervention contributed to the change
	overcoming its weaknesses and building on its strengths
Patton/McKegg/Weipehana	Involves evaluative thinking throughout
	Evaluative judgments...are ongoing and timely
	learning leads to a significant change
	adaptive learning
	change processes...learning and adaptation
People to People	real-time adjustments to programming
	learning
	ongoing program development
	adapt programs
	requires adaptability
Practitioners Perspectives	"self-taught" developmental evaluators "learn as we go"
	tactical and more organic in building a body of qualitative and quantitative evidence
	allow further exploration and development
	inquiry
	inquiring mindset
	facilitated and created opportunities for multiple perspectives to be heard and to contribute to
	Openness to learning and inquiry
	ready are you to engage in systematic data collection
Principles-focused Developmental Evaluation	intended and emergent results
	learning
	adaptation
	self-reflection
	self-assessment
	reflect continually
Vibrant Communities	learning-oriented
	theory-of-change approach
	experiment
	Comprehensive thinking and action
	Learning and change
	Embracing a long-term process

		determining who needed what type of evaluation feedback
		learning-by-doing approach
		encouraged thinking about their work as a "hypothesis" or "bet" that required experimentation and testing
		real-time feedback
		continually adapting evaluation measures
		focus on continual learning and change
		focus on assessing, not just describing
		exhausting
		rewarding
Creativity	Arts and Community Funder	traditional ways of working begin to shift
		expectation is for further development on something innovative
	Collaborative Crop research	room to innovate and adapt
		allows space for innovation
	Frontiers of Innovation	an architecture for innovation and change
	Guiding Principles	informing ongoing innovative development
		developing rapid responses in crisis situations
		adaptive innovation
		adapting effective principles validated in one context to a different context
		identifies the promising alternatives to the dominant approach
	Maori Educational Success	nonlinear and emergent trajectory of innovation
	Maori Sport Recreation	creativity
	Ontario Ministry of Education	tailor/differentiate support
		Adaptation and innovation
		change and innovation
	Patton/McKegg/Weipehana	Creating new approaches to intractable problems
		Improvising rapid responses
		innovation unfolds
		Developmental evaluation enhanced innovation
		innovation
		take risks
		Innovative situations
		larger methods toolbox
		emergent design...volume of data

		reflexivity
		innovation
	People to People	"emergent" strategies
		pilot or adopt innovative approaches
	Practitioners Perspectives	data collection and evidence gathering are adapted for contextual appropriateness
	Vibrant Communities	traditional planning approaches were completely unsuited
		adjusted the criteria for reporting quantitative outcomes
		adapted the process for facilitating annual reviews
		"storytelling" format
Credibility	Collaborative Crop research	commitment of time and resources
		accountable to principles
		mutual trust and credibility across the program
	Guiding Principles	stay empirically grounded
		some knowledge of evaluation, innovation, complexity concepts, and systems thinking
		stay empirically grounded
	Maori Educational Success	do as they say they will
		reflected in the roles, responsibilities, and accountabilities
		authentically
	Outcome Harvesting	accountable to its stakeholders
	Practitioners Perspectives	Data are layered over time and aligned with the organizing framework
		Without data and without evaluative questioning, it's not developmental evaluation
		building developmental evaluation's credibility
		agility and adeptness/capacity
Cultural awareness	Creating Safety to Explore	good "people skills"
	Guiding Principles	staying attuned
		Timely feedback
		timely feedback
	Maori Educational Success	Responsive to context
		Cultural ontologies, epistomologies, nuances, meanings, metaphors, customs and beliefs
		cultural philosophies and practices
		culturally responsive
	Maori Sport Recreation	cultural meanings and dynamics

		Cultural concepts
		cultural practices
		process
		contextualized
		cultural affirmation
		cultural distinctive elements
	Ontario Ministry of Education	encompass the perspectives of many parties
	Outcome Harvesting	deliver their outcomes within the planned time frame
	Patton/McKegg/Weipehana	customization
		flexibility
		customized solutions
	Practitioners Perspectives	Indigenous knowledge
		context is often highly volatile
		expertise in facilitating and engaging in deep, collaborative, and evaluative inquiry
		respond to the innovation and the evaluation as necessary
		prepared to stand up to criticism
Content knowledge	Creating Safety to Explore	informed
		current knowledge
	Guiding Principles	capacity to work quickly
	Ontario Ministry of Education	effective practice
	Patton/McKegg/Weipehana	facilitation skill
		skilled engagement
		attention to structure
		intuitively led to it
		requesting qualifications and competencies+
	Practitioners Perspectives	management and strategy
		rapidly
		step into a number of roles when necessary
		Evaluative thinking
		highly developed understanding of the context
		A deep well of evaluation and methodological experience
		readiness
		have a range of experience with using different methods
	Principles-focused Developmental Evaluation	identifying the principles
	Vibrant Communities	evaluation expertise
Sensemaking	Arts and Community Funder	sense making
		build a body of knowledge
		community of practice
		combines practice and theory
		a suite of activities that were component parts of an overall initiative

	theory of change
	in developing a theory of change
Challenge Scholars	theory of change
	designing and developing the initiative
	overseeing implementation
Collaborative Crop research	beyond replication to include adaptation, inspiration, innovation, and policy change
	new projects were the ones that were most receptive to structuring their projects around ToCs
	collectively develop a CCRP theory of change
	embedded a Theory of Change
Creating Safety to Explore	tease apart what the actual model
	develop the model
	clarity about the things we could change
	clarify practices
	strengthened our understanding
	"bigger picture" perspective of the model of care
	Discover meaning, purpose, and clarify issues
	clarification of what and where information
Frontiers of Innovation	prioritizing
	ongoing iteration between strategy and design
	theory of change
	innovation by design
Guiding Principles	principles-based
	problem identification
	Deepening understanding of context
	principles-focused
	situation analysis
	build in regular ongoing opportunities for feedback, discussion, sense making, and adaptive decision making
	frames and focuses
	understanding the situation
	identifying the nature and patterns
	Understand and interpret
	make sense of the problems being addressed
	integrate
Maori Educational Success	theories of change
Maori Sport Recreation	principles-focused
	focus
Ontario Ministry of Education	examine their own practice

		improvement plans
		logic models
		articulate the message that we want people to be looking at the data
	Outcome Harvesting	assess efficiency and effectiveness in a useful manner
	Patton/McKegg/Weipehana	direction
		sensing program energy
		principles-focused evaluation
		Look for effective principles of practice in action
	People to People	adapted
		explicitly identify and articulate any planned changes
	Practitioners Perspectives	makes a real difference
		iterative
		data-informed, critical, evaluative thinkers and decision makers
		sense making
		An organizing framework is developed
		progresses in short cycles
		framing their data collection around key questions
		Clarity
		values-based collaborative sense making
		use of organizing frameworks
		use of analysis frameworks
		very often success is defined by what's not happening
		demonstrate the value of evaluative thinking
		constantly looking for opportunities to advocate
		Explaining developmental evaluation
	Principles-focused Developmental Evaluation	Guiding principles
		clarity
	Vibrant Communities	getting a grasp of the level of detail that could reasonably be expected
		theory of change as a viable alternative to the logic model
Stewardship	Collaborative Crop research	principles have emerged
		constrained by grant-making processes and protocols
	Guiding Principles	bring effective, constructive and serious accountability to settings where traditional tools don't suffice

	attentive
	adopt
Patton/McKegg/Weipehana	servant leadership
Practitioners Perspectives	need for courage
	try again and again and again
Principles-focused Developmental Evaluation	Evaluating principles
Vibrant Communities	Principles
	establish a number of minimum specifications--such as principles, boundaries, or key processes--and allow actors to work adaptively, creatively, and flexibly within that container