Social Entrepreneurship has Complexity Science Written All Over It: The Promises of a New Collaboration

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Abstract

This paper looks at how ideas, constructs, methods and insights coming out of systems thinking and the sciences of complex systems can be applied to the study of social entrepreneurship. At present, there is no one general theoretical perspective that seeks to define social entrepreneurship in *complex systems* terms nor to explain how such a perspective can contribute to the generation of positive social outcomes. To remedy this, we propose ways that complexity theory can be used to develop a useful, and we hope, more practical theory. In particular, we explore how complexity ideas might be used to develop a robust theory of social entrepreneurial dynamics from the interrelated theoretical lenses offered in the complexity science approaches of social network theory, the study of emergence in self-organizing systems, complex adaptive systems theory, and nonlinear dynamical systems theory. After describing various possibilities, some hopeful thoughts on the future of the field are offered, particularly a call for initiating evolving partnerships among complexity scientists and social entrepreneurial practitioners and theorists.

There is nothing more practical than a good theory.
-- Kurt Lewin

Introduction: Social Entrepreneurship and the Sciences of Complex Systems

The Acumen Fund was initiated in 2001 for the purpose, in the words of its founder, the international banker Jacqueline Novogratz (2009: 1,2), of addressing "poverty in a more insightful way…my work in Africa also taught me the extraordinary resilience of people for whom poverty is a reality not because they don't work hard, but because there are too many obstacles in their way". The phrase "too many obstacles in their way" might at first impression be thought a prelude to the despairing conclusion that "giveaways" are the only way to help the poor. But notice that such a response was decidedly *not* the conclusion Novogratz reached in founding The Acumen Fund. Instead, the very fact of obstacles *allied with* the recognition of the "extraordinary resilience" of the people affected by poverty and related social ills have only served to further spark an entrepreneurial spirit replete with intelligence, concerted effort, and the involvement of all the many stakeholders. It is this "extraordinary resilience" of people affected by difficult conditions who then are galvanized into cooperative action which this paper exams through the lens of the sciences of complex systems, sometimes known under the term "complexity theory".

In mobilizing the "Millennium Pledge" to eradicate poverty by 2015 and to tackle pressing social issues in such areas as education and health care (Millennium Project, 2006), donor nations had by 2006 provided more than $104 billion (in US dollars). Yet, despite the major investments of time, money, goods, supplies, and other resources, large

scale foreign aid programs have had only mixed success. Certainly, some have made spectacular gains, particularly in the health care arena, while others have been hampered by the enormity of the need, a growing income and resource inequality, armed conflict, natural disasters, poor policy decisions, bureaucratic inefficiencies, corruption, mismanagement, and other factors. In this paper, we would add another crucial factor hindering success, namely, the lack of a *complex systems* perspective that takes into account scale effects, unintended consequences, the lack of conditions for the emergence of innovation, and many other dynamics of complex systems that are being uncovered by wide-ranging research in complexity theory.

Of course, it is partly in response to the limitations of such programs (see, e.g., Easterly, 2006) that social entrepreneurship efforts have emerged with a decided partnering/collaborative orientation. Usually such efforts consist of *multi*-partnerships among funders, government agencies, the social entrepreneurs themselves, the clients served, and diverse community members. Partnerships that develop between the targeted group and social entrepreneurs provide input about the group's own needs within the context of their social mores and cultural values. This insider orientation enables the targeted groups to take a more active role in problem identification, policy decisions, and implementable solutions. Partnerships, collaborations, cooperative social networks are all areas under intense research today by complexity scientists.

The great social science pioneer Kurt Lewin once said "there's nothing as practical as a good theory." The authors of this paper believe that complexity theory is providing one such "good theory" in Lewin's sense, that is, a theoretical perspective with highly practical consequences. By now, many inspiring stories of social entrepreneurial

ventures have appeared in print or are being circulated among communities, at the numerous conferences, associations and funding agencies that have sprung up around social entrepreneurship. These narratives describe crucial elements that underlie program success including pressing social/community needs, how the founders of various programs overcame difficult challenges, the resources that had to be marshaled, external issues that had to be mastered, and so forth. These stories are inspiring not only because of the worthwhile nature of the missions involved but also because of the often heroic actions and capabilities of the founders.

However, as the founders of these effective social entrepreneurial ventures have indicated themselves, over and over again, the success of social entrepreneurial ventures hinges in large measures on the *cooperative social networks* that these founders have helped establish and facilitate. One very important aspect of complexity science deals precisely with the nature and dynamics of social networks, e.g., at Oxford University's CABDyN Complexity Centre. The theory of social networks is one aspect of what we are considering the advantage of complexity theory applied to social entrepreneurship, social network effectiveness certainly being one of the keys to showing how social entrepreneurial ventures are building social capital (Beinhocker, 2006).

From our wide backgrounds in both complexity science and entrepreneurship (social and otherwise), we are convinced that social entrepreneurship has complexity dynamics written all over it. This is evident even in the title and description of the current Skoll conference, a topic we return to below.

The Complexity Science Perspective:
Founders and the Establishment of Cooperative Social Networks

Two salient features of the narrative content of the stories describing social entrepreneurial programs have been the special abilities of the founder(s) in attracting and motivating his/her "followers" as well as how these founders have successfully established cooperative social networks within which the program's mission is communicated, work practices are structured, resources acquired and allocated, and so forth. Take, for example, the inspiring story of the *Associação Saúde Crianca Renascer* ("The Association for Rebirth in Children's Health" -- recounted in Bornstein, 2004) founded in 1991 in Rio de Janeiro by the Pediatrician Vera Cordeiro in order to provide health care services, health education, community health improvement, even workforce development to the poor, "slum" sections in Rio known as *favelas*. The story of *Renascer* is a particularly inspiring one for several reasons, not least because of Dr. Cordeiro's admirable vision and her unique qualities. But it is also inspiring because of the great challenge it faces, namely, grinding poverty found in Rio's many favelas, a poverty made even more noticeable in the face of the stupendous natural beauty and incredible wealth also characterizing the "marvelous city" of Rio de Janeiro (*Cidade Maravilhosa)!*

On one side of a mountain, with spectacular views of the tropical South Atlantic, there may be a huge *favela* of upwards of 200,000 inhabitants while on the other side of the mountain, multi-million dollar (US) estates dot the landscape. The disparity is startling: between two sides of one of the main *avenidas* forming a boundary between the wealthy neighborhood of Gavea (not far from Dr. Cordeiro's hospital and clinic in Lagoa) and its gang-led, *favela* neighbor Rocinha (see Goldstein and Zeidan,

Forthcoming), there is a 9-fold difference in employment, a whopping 17-fold difference in income, and a 13-year difference in life expectancy (*The Economist*, 2007)! Rio is truly a place where the beautiful, "tanned and lovely" "Girl from Ipanema" (from Antonio Carlos Jobim's famous *bossa nova* song) can be found walking along one of the most beautiful beaches in the world just a few feet away from a group of very young, obviously undernourished, even crippled, "street" (read: "homeless") children who are begging for just a few centavos to get something to eat. In the meantime these children are often hassled or even beaten by the pervasive military police (frequently witnessed by one of the authors of this paper)!

In order to account for *Renascer's* resounding success, the Head of the Pediatric Ward declared: "Here I can say with absolute assurance that the main element for *Renascer's* success was Vera…" (Bornstein, 2004: 145). Yet, Dr. Cordeiro herself sees things differently, and this, we claim, should not just be seen as a token of her modesty – instead, she places the reason for *Renascer's* success on how she "had brought people together…it was their collective energy that made it all happen" (Bornstein, 2004: 145). It is this *bringing together of people*, this emergence of collective dynamism that has been one of complexity theory's main objects of inquiry in the social sciences. Certainly, theoretical attention needs to consider unique leadership traits but attention must also be focused on the *systemic* factors such as potent social networks that enable and sustain such programs, factors that we believe can be codified and duplicated elsewhere if the right theoretical model can be developed.

Here is another example that suggests a refocusing of understanding the success of social entrepreneurial ventures onto the social networks being generated: the *Barka*

Foundation for the Promotion of Mutual Help established in Poland by Tomasz Sadowski and his wife after the break-up of totalitarianism (Bornstein, 2004). Like, *Renascer*, *Barka's* story has complexity science written all over it. One resident put it this way, "We are all people with problems…[the] biggest miracle is that we sit at one table and talk with each other... at the end of the day I feel needed" (Bornstein, 2004, p. 203). Again we see the tell-tale signs of complexity in the emergence of a social network where cooperation is the dominating value that results in individual empowerment and community betterment -- as Sadowski himself said, "People told us that it wasn't possible to create such an inclusive feeling…there is nothing mysterious about it. …The worst criminal doesn't believe things can be this way only because he has never come across these kinds of relationships..." (Bornstein, 2004: 203).

Without denying the potency of charismatic founders, in a complexity science informed perspective, one relevant to the social networks to which Vera Cordeiro and Tomasz Sadowski both attributed the success of the their respective social entrepreneurial ventures, attention is placed on the creation of *information-resonant social networks*, establishing the *requisite complexity* which complexity science has shown fosters the emergence of innovation, facilitating *self-organizing* social processes, shaping the organizational cultures toward the *emergence of cooperative strategies*, and vitally *linking* the internal agents within the enterprise and to their many external environments. A complexity-based framework, built-up in a cogent *theoretical* matter, can, as Lewin suggested, yield indispensible insights into the *practical* nuts-and-bolts requirements for implementing and sustaining viable social entrepreneurial ventures.

To be sure, complexity science is a young discipline, burgeoning in many fascinating directions. Therefore, it needs to be spelled out which specific aspects of complexity apply best to an integrated theoretical perspective on social entrepreneurship. We will explore three interrelated approaches arising in the science of complex systems that speak most directly to the issues raised among the many narratives and cases of social entrepreneurial efforts (because of space limitations, these explorations will of necessity be brief):

1. Social networks: the social linkages through which decisions are made, communications facilitated, cooperation expedited, and resources exchanged and allocated:

2. Self-organization and emergence in complex adaptive systems: the nature and dynamics of how systems can adapt quickly to environmental opportunities and threats through innovative new structures;

3. Dynamical systems analysis: the basic patterns of how complex systems evolve over time through bifurcations and the emergence of new attractors;

The Key Role of Social Networks

As is well-known, a social network is composed of persons linked together in a particular structure or "topology" of connectivity exhibiting different patterns in the distribution of the agents linked and the nature of the linkages. For example, there can be *hub* networks (as in many airline travel routes with a hub city), random networks (where linkages are added randomly), small world networks (the famous six degrees of

separation networks), and scale-free networks (Barabási, 2002) which exhibit a power law signature in the distribution of nodes and linkages, meaning there are just a few nodes that have the preponderance of linkages, a midsize number of nodes have less linkages, and most nodes have very few linkages. Each social network type has advantages and limitations that need to be addressed in the implementation of social entrepreneurial ventures.

For instance, Jones (2007) explains how different types of networks evoke different levels of cooperation: a scale-free networks may not be ideal for eliciting large scale cooperation since many people are left out of the rich connectivity within the social network. Yet, in a scale-free network there is the possibility that actions can be taken to make it more inclusive by intentionally connecting the "outlier" or marginalized persons to the mainstream (see Goldstein and Zeidan, Forthcoming; and, Faherty, *et al*., Forthcoming). In other words, a smaller world network can be constructed out of a larger one adding more connections between the right people and thereby facilitating greatly enhanced communication.

Even in a so-called random network where new connections are added at random, there eventually can be the emergence of what's called a "giant cluster" in which, with an average of only one connection per node, all nodes can become connected thus allowing for information flow throughout the network (Newman, 2003). Having everyone connected in such a fashion may bestow the kind of information flow that is a success factor for a particular program.

A critical aspect of social networks involves their capacity to be *information-rich* or to have broad "bandwidth." According to Gulati (1999), networks that develop

across organizational boundaries provide opportunity sets that can ultimately influence strategic direction across traditional organizational boundaries (indeed, this has been identified as one of the descriptive metaphors for the upcoming Oxford conference for September, 2009; see also Seitanidi, 2008). These social network connectivities enable organizations to obtain knowledge about available resources or regulatory requirements, or to learn of opportunities to forge new alliances. Sometimes, however, social networks constrain the amount of available opportunities and information. This occurs when the networks are not sufficiently broad or diverse, when the networks themselves restrict access to specific information, when the networks are misaligned, or when membership within a network constrains the type of information that can be shared.

Social networks also facilitate the development of *network dependent learning*, a nonlinear, multi-level emergent property of the collective that occurs as individuals interact with others and with their environment in a group or networked setting. Thus, learning can emerge from micro-enactments between individuals or groups (Silberstang & Hazy, 2008; Hazy & Silberstang, 2009, Forthcoming; Silberstang, & London, n.d.) as well as from macro system-wide interactions as many levels simultaneously co-evolve.

Such learning facilitates the identification of goals and the attainment of desired outcomes under conditions of environmental uncertainty. Along the way, social value is created as shared information is channeled to enhance capabilities and mobilize resources. As resources, capabilities and competencies are aggregated within a social connectivity network, the super-additive effect gives rise to an increasingly dynamic and complex social network (Dagino, 2004).

Agent-based models that examine the emergent properties of networks computationally can be developed to simulate the emergence of learning within social entrepreneurial ventures at the systems level as well as at the micro level (Yuan & McKelvey, 2004). Here, the richness of micro-diversities interact with micro-contextualities in the 'real-world' which then further informs these models (Allen, Strathern & Baldwin, 2007).

Social networks can also be roughly divided into those that are *hierarchical*, that is, with information predominantly flowing from the top downward as in typical management pyramids, or *heterarchical* where the information flows in lateral directions. Hierarchy and heterarchy also refer to how command and control is exercised in complex systems, either top-down command and control in the first case or distributed command and control in the second (Hazy, Goldstein & Lichtenstein, 2007). Most social entrepreneurial programs express a heterarchical control network with a free flow of lateral information. Indeed, as was stated above, even the founders point to social networks as the actual mechanisms for program effectiveness and not the founder's own hierarchical role. Founders are, in fact, inclined to see themselves as equal in status even if certain members possess higher levels of expertise and credentials.

Heterarchical cooperation was a key factor in Brazil's unique ability to hold in-check its potentially devastating aids epidemic in the 1990's (Westley, Zimmerman, & Patton, 2007). A concerted and cooperative heterarchy of clinical specialists, clergy, community activists, and volunteers of all stripes and colors made their rallying cry a dedication to ensure that resources for prevention and treatment would be made available to all citizens without regard to their socio-economic levels. The result was that, whereas

in 1990 Brazil had twice as many cases of HIV/AIDS as South Africa, by 2007 it had reduced the rate of infection to only .6% and is now seen as an exemplary model of aids prevention for the rest of the developing world.

Heterarchy is expressed in the process of *co-creation*, where those served become active partners in the generation of ideas and solutions (Prahalad, 2006). As described by Faherty *et al.* (Forthcoming) in their case study of the revititalization of a New England industrial town, strong leadership coupled with actively seeking out and engaging diesnfranchised populations resulted in successful community development and supportive housing initiatives. Traditional approaches to the process coupled with a soft systems methodology expanded the leader's original vision, and enabled different factions within the community to redefine the need, the issues, and take ownership of the process. The shift from the leader's early vision and direction to the deployment of heterarchical cooperation enables the further generation of ideas and a democratization and deployment of the leadership process as it occurs within emergent events. This doesn't, however, obviate the need for strong leadership and designed infrastructure, but it puts the latter into a different context of operation.

Self-Organization and Emergence in Complex Adaptive Systems

The complex adaptive systems approach to social entrepreneurship focuses on the emergence of innovative structures and dynamics out of self-organizing interactions among semi-autonomous actors. It is an approach that intuitively seems right for the field since social entrepreneurship involves actors interacting within a social network whose

interactions are the source of innovative adaptations for not only the complex system

itself but the various community environments with which it is interacting.

One of the most intriguing aspects of complex systems is the finding that the

patterns emerging at a collective level are difficult to predict. And yet, it is often these

higher level performance variables in which we are interested, particularly in relationship

to social problems under study. This is because of the adaptive potential of these

performance variables. That is where the term "complex adaptive systems" comes from,

this emphasis on how emergence of structures within the interactions fosters greater

adaptability. Moreover, emergence tends to take place when complex systems are a

disequilibrium, a condition alluded to in a recent application form for the Skoll

Foundation:

> Equilibrium describes a stable state, generally economic or social, controlled by and benefiting established entities. The social entrepreneur sees the limitations of an existing equilibrium and offers a more efficient solution with the potential to benefit those not served by the existing model. Skoll is seeking social entrepreneurs who have created and are implementing new, large-scale approaches that can change the equilibrium by fundamentally transforming the lives of marginalized populations. The ultimate example of equilibrium change would be to eliminate a problem by solving its root cause or to create global impact by driving universal adoption of a new innovation by all others who address the same issue.

In a stable or equilibrium state, differences and departures from equilibrium and the norm

are washed-out rather than being the seeds of new order. In contrast, research into the

phenomena of self-organizing physical systems shows that new structures with new

properties arise typically when departures from the norm (or equilibrium) are amplified

into new patterns (Nicolis and Prigogine, 1989). To be sure, in social systems, the notion

of equilibrium is less well defined. Still, the idea that greater internal complexity implies

that self-organization can occur remains a useful construct. For social system disequilibrium we are using the term *dynamics of requisite complexity*, to capture that beyond a certain threshold of complexity, requisite conditions exist for self-organization and emergence of innovation.

Indeed, one of the remarkable features of social entrepreneurial programs is their ability to prompt innovation and adapt. Therefore, they must in some way or another partake of conditions reflecting the dynamics of requisite complexity. Another complexity construct also turns out to be particularly pertinent to this kind of social entrepreneurial innovation, namely, the idea of emergence, which refers to the arising of novel patterns, novel structures, and novel properties in complex systems (Goldstein, 1999; 2006; and 2007). Emergence encompasses a wide variety of complex systems cutting across a wide variety of phenomena.

One factor that is often seen in the emergence of innovation characterizing social entrepreneurial ventures is a recombination of already existing elements (e.g., the mixing of hierarchical levels, areas of expertise, differing perspectives, and so on). Indeed, combining existing order in new ways is a hallmark of the innovations exhibited in emergence. This recombination is along the same lines as how Kary Mullis, Nobel Laureate in chemistry for his invention of polymerase chain reaction (PCR), described the key to his scientific success: "In a sense, I put together elements that were already *there*, but that is what inventors always do. You can't make up new elements, usually. The new element, if any, it was the combination*,* the way they were used" (quoted in Sutton, 2002: 22). Mullis' description indeed hearkens back to how Thomas Edison

described the art of invention, "To invent, you need a good imagination and a pile of junk!."

An example of using what is already available but in new ways and combinations is recounted by Westley, Zimmerman, and Patton (2007). The Canadian clothes designer Linda Lundström used her expertise in design along with her memories of growing up in Red Lake, a mining town in Northern Ontario with a sizable population of Native Americans who are now called "First Nation." Lundström remembers their crafts as well as the endemic racism. In her work, she combines these two memories through the Kiishik Fund, a foundation that aims to educate children about the First Nation's heritage through experiential classrooms where native language, art, and traditions are shared.

Indeed, as described in the examples above, instead of viewing emergence as a unforeseen phenomenon that is somehow interfering with proceeding ahead with the business of the social entrepreneurial venture, emergence can be embraced as a means for transforming the enterprise itself. Unfortunately, in some social entrepreneurial efforts hierarchy becomes ossified over time; those in the management structure begin to primarily redirect their focus to the nuts and bolts of running the enterprise, and in this inward turning, mission accomplishment slowly becomes subsumed to maintaining the status quo. When this occurs, routines become less flexible, and regulations govern, and in some cases, limit action. Applying a complexity theory lens to these issues underscores the necessity of redirecting and/or reenergizing social entrepreneurial ventures through emergence. A theoretical focus on conditions that enhance emergence within an established social entrepreneurial venture, we believe, can translate into a practical approach to the sustainability of the venture (for however long it needs to exist to carry

out its mission), and most importantly, enables it to successfully address pressing needs that may be identified as time goes by. Thus, a complexity approach would provide new ways of examining and addressing process, outcome, and context innovation, a need firmly embedded in the quest for social innovation, as specified in the Skoll conference brochure.

Dynamical Systems

The very nature of social entrepreneurship with its mission-intentionality places an emphasis on social outcomes, and not as much on the systems' dynamics nor even on the individual entrepreneur. This is ironic since, as we pointed out above, it is the individual entrepreneur who so often gets a great deal of attention and who creates successful ventures through effective social networks. Generally, the socially desirable outcomes are understood as intentional ones and not simply emergent patterns in the complexity science sense. This means that in social entrepreneurship projects, both the intended and the emergent outcomes must be taken into consideration when evaluating the potential of projects. The important dual considerations become: i) determining the desired outcomes; and, ii) organizing disparate interdependent activities among interconnected and interacting agents who come together to achieve the desired *and predicted* outcomes.

From a dynamical systems perspective, a major mathematical and scientific underpinning of complexity science, this kind of problem is framed in the context of variables of interest about which assumptions are made concerning how they will change

with respect to one another over time. The sum total of all possible combinations of these variables and their rates of change is represented in a *state space* and the subset of combinations which are found to represent the system as it iterates through time form a *phase portrait* in the phase state. Then from studying the phase portraits insight into the dynamics of the evolving system can be obtained. Epstein (1997) describes several classic examples of dynamical systems models as applied in biological and social situations. These techniques have also begun to provide insights on leadership in complex systems (Hazy, 2008).

In the Brazilian case of *Renascer* described above, recidivism rates could be considered using dynamical systems techniques. For example, an epidemiology model could be modified to predict rates of recidivism in relation to unemployment, *per capita* income and economic conditions, etc. These models can be combined with empirical studies to begin to understand more deeply how changes to one factor might ripple through the system of interacting variables to impact desired outcomes.

When it is social outcomes that are anticipated from social entrepreneurial activities, dynamical systems approaches can use variables for the social phenomenon of interest, and then generate a model that can replicate and point toward future outcomes from the observed information. This includes the ancillary effects which, although not directly relevant to the outcomes modeled, may in complex settings offset the overarching social benefits of the projects under analysis. In systems thinking this is generally known as "unintended consequences." Harmful collateral effects could result in the failure of the program. For example, it would be meaningless to improve recidivism

in *Renascer* if that result came at the cost of an increase in mortality due to infectious diseases contracted at the clinics.

Stability and attractors in dynamical systems: One of the crucial insights of understanding complex systems in terms of dynamical systems theory is that dynamic stability is possible and can be usefully described using the notion of dynamical *attractors*. Among the startling and fascinating attributes of nonlinear systems are the existence of negative (or dampening) and positive (or amplifying) feedback. Indeed, this can be observed in the business context. The fact that wealth grows in relation to its size (i.e., wealth grows exponentially via reinvested returns combined with an ongoing return on investment) is the underlying "big idea" behind the generation of global and domestic economic growth. It also shows up in social networks, particularly in the topology of scale-free networks in which nodes with high degree, that is, a large number of links, tend to attract even more links (see Goldstein and Zeidan, Forthcoming).

On the other hand, unbalanced amplifying feedback can lead to uncontrolled divergence in the system's dynamics (the familiar feedback from electronic amplifiers when an open microphone is pointed toward the speaker is an example of this) that cause nonlinear systems to be unstable except under certain parametric conditions. Stability in one form or another makes a level of predictability possible. Conditions of stability and near stability and the notion of equilibrium that we described earlier are associated with the convergence toward *attractors* in state space.

Attractors are defined as subsets of state space where the systems' dynamics can become "trapped" within the attractor (Hirsch, Smale & Devaney, 2004).   In other

words, an attractor is a set that in some sense "attracts" all nearby solutions and although the specific solution may not be predictable, one can predict that the system's behavior will fall within the attractor, the system's dynamics are confined to what's been called an *attractor cage* within which the system's ongoing behavior is reasonably predictable.

Activities—actions and choices by individuals and groups—that occur in organizations whose dynamics are constrained within an attractor cage are said to operate within a *convergence context.* Social entrepreneurship projects often operate in this way, particularly when resources are scarce and increased efficiency is required. For *Renascer* in Brazil, relative stability within the center, once it was set up, was a key enabler of success. In a different example, in their studies of generational conflicts in a social entrepreneurial context among the Maori in New Zealand, Tapsell and Woods (2008) describe the elders among Maori as supporters of stability; in effect they operate within a convergence context. As such, considerable time and energy are spent in organizations navigating state variables of culture and dampening attempts at change.

Generative dynamics and divergence within attractors: In their study of a Mission Church in Texas, Plowman *et al*. (2006) observed the regeneration of a community in decline. What had been a traditional affluent church community became, over the course of several years, a socially active community service organization that ran soup kitchens and neighborhood clinics. This transformation of Mission Church was serendipitous, but this does not have to be the case. Surie and Hazy (2006) described an intentional regeneration of an Indian manufacturing firm as its interaction dynamics led to their revitalization from a small domestic company into an international automotive firm.

What is common in these stories is the presence of divergent dynamics taking place within otherwise converging actions within an attractor cage. For the Mission Church example, the process was unintentional. Before the changes described in the case, the congregation was reasonably homogeneous, and thus it was undifferentiated along the dimension of affluence. Everyone was relatively well off and did not require community services. As the new leadership loosened the constraining forces that held the organization inside its attractor cage, new, less affluent constituencies were allowed to enter the system. These new players had divergent interests with respect to their personal and family needs. This was clearly illustrated when a group within the church opened a soup kitchen to support the homeless constituency. In this way, divergence was introduced into the attractor of the mission church, and the attractor cage for the church became more complex (Plowman *et al*, 2006). It remained within an attractor cage, and thus was convergent, but the new attractor included divergent aspects.

Lichtenstein and Plowman (Forthcoming) used the Mission Church study and two others to identify four stages of regeneration: a far-from-equilibrium state; amplifying actions; recombination/self-organization; and stabilizing feedback. Divergence results from repeated amplifying actions along certain dimensions while convergence occurs in the presence of stabilizing feedback that maintains the system in its attractor cage. Under conditions where both are simultaneously present, new possibilities can be discovered.

Social programs occurring under conditions of divergence along some dimensions can also, in the case of a complex attractor, converge in the presence of a *generative context* for social entrepreneurship. In a generative context, something brand new and

unexpected can happen, the very meaning of divergence, yet this divergence can be

channeled in the direction of constructive organizational and community dynamics.

Unifying organizing dynamics across systems: The case of Front Line described by

Donnelly-Cox and Rhodes (2008) makes another point about social entrepreneurship.

When Mary Lawlor left Amnesty International to found what became Front Line, the

International Foundation for Human Rights Defenders, she left with her own skills, her

social network connections, and a substantial funding source, but little else in the way of

organization. In our terms, initially, there was not an attractor toward which the activities

of the organization would converge.   Celebrities and other sponsors were used to gain

publicity, but these participants were not a permanent part of the organizations. To

develop a sense of unity and purpose for participants, conferences were arranged as

platforms for discourse.

These events precipitated the formation of attractors in the short term as people

joined forces to make the conferences work. Once each was over, however, many people

went back to their daily lives. As such the Front Line organization itself needed to hang

together as an entity even as event related attractors came and went over the years. This

was a critical challenge for Mary. According to her, a key enabler of success for the

organization was remaining flexible enough so as to be able to respond to the changing

needs of the individual human rights defenders. As she put it:

> In any organization there is a constant expectation that we will do more and
> deliver more. As a result we have to grow our services and build our capacity to
> respond to peoples in need. The danger is that the growth, in budgets, supporters,
> and activity becomes an end in itself, divorced from the needs of the people we
> serve. The end game however, is our capacity to deliver the desired result of

change for the people we were set up to help (Quoted in Donnelly-Cox & Rhodes, 2008).

As Walter Buckley (2008) describes in his classic paper on complex adaptive systems, social systems are more complex that other systems in part because their components change even as the system changes. This implies that in addition to simultaneously navigating both a convergent context and a generative context, there is also a *unifying context* to be considered when constructing a theory of how social entrepreneurship delivers positive social value.

Conclusion:
How Social Entrepreneurship Constructs Social Value

When these three complexity science approaches, the use of social networks, self-organization and emergence in complex adaptive systems, and dynamical system analysis are placed together, they form the beginning elements of an overarching theory of how social entrepreneurship creates social value in complex human systems. The questions we would like to address are of three types. Firstly, what is going on within social entrepreneurship when it is assumed to be a complex adaptive system composed of interactions within social networks and displaying features of dynamical systems such as emergence, self-organization, and the transition through different attractor regimes? Secondly, for individual agents embedded within such a system, what are the effective ways to act in order for the mission be accomplished? In other words, how can individual agents within such a system, ordinary and not so ordinary people, influence these processes and outcomes? Finally, what types of interventions can arise from a

complexity science lens in terms of improving communication, interactions among the various stakeholders, mission accomplishment, and ultimately the lives and livelihoods of those served?

As shown above and as described by Schwandt, Holliday and Pandit (Forthcoming) and Wallis (Forthcoming), developing a theory of social entrepreneurship from a complexity perspective is not without its challenges. Complex adaptive systems are composed of heterogeneous interacting agents and the social networks that interconnect them. These systems represent situations where rapidly increasing complexity can quickly overwhelm any individual agent's ability to comprehend, model and respond to their environments (Hazy and Silberstang, 2009). As the number of agents increase, the number of possible connections increases at an exponential rate, what is known as a "combinatorial explosion" which can hinder the potential success of social entrepreneurial ventures.

This is less of a problem when the problem is small, one's models are good and one knows what is expected. One can see this process at work in the partnership between the Royal Bank of Scotland and the Princes Trust that was described by Seitanidi (2008). But when the dynamical systems model that is needed to navigate the environment begins to exhibit dynamics that includes a rapid increase in requisite complexity, the agents using it become uncertain about what is expected. As a result, they often engage in experimentation as a way to address perceived opportunities and threats. Many of these experiments persist and are not immediately abandoned since it is unclear which results are meeting uncertain expectations. Conflicting approaches can even be sustained in parallel, creating in the aggregate, ever more information about the system and the

environment. This increase in useable information presents an opportunity. If perceived patterns can be recognized and the implied regularities can be used in new ways (Crutchfield, 1994) to find novel predictive capacity, actions that use this predictive capacity may eventually lead to the emergence of qualitatively new models of the environment (Crutchfield, 1994) and structures that are stable within it (Haken, 2006).

When the opportunity potential in the environment involves a social objective, the specific nature of the expectation is often even more uncertain. The challenge is made more difficult because social value is currently an ill-defined construct in social sciences. (Some of the challenges associated with this idea and with measuring it are described by Hazy, Moskalev and Torras, Forthcoming).

Social entrepreneurs attempt to recognize patterns (and encode in their models) aspects of opportunity and risk potentials in the environment. These are the targets of social value creation—reduced poverty, better health care, collective response to climate change—that social entrepreneurship targets for organizing projects. Working across networks, sharing information, building dynamical systems models, are the tools that complexity science offers to practitioners constructing an emergent society that satisfies the promise of our better selves. Perhaps it is a path to the higher level of dynamic stability that Torras (Forthcoming) envisions. This is our challenge and our opportunity.

Working in concert, a Complexity and Social Entrepreneurship Partnership could join forces to: develop and refine tools, strategies, policies, and methodologies; plan, implement, assess, improve, and scale-up projects; model alternate scenarios to address varying conditions; coordinate lessons learned with new concepts; and, in the process, create both knowledge banks and real-time networks that can further support and provide

additional capacity for social transformation within communities and throughout the world. This Partnership can truly actuate the goals of "empowering people to make choices for themselves and their children" (Wolfensohn, 2005) as well as finding ways around the *obstacles* that Novogratz (quoted in the first paragraph of this article) so eloquently called attention to as what really limits the aspirations of the poor.

We envision this Partnership as fundamentally reciprocal, where complexity informs social entrepreneurship practices and social entrepreneurship informs complexity, a reciprocity that will further the development of a more insightful robust theory of social dynamics. We launched this Partnership in April 2008 with the convening of the First International Conference on Social Entrepreneurship, Systems Thinking and Complexity, held at Adelphi University, in Garden City, NY. At the conference, social entrepreneurial practitioners and systems thinking and complexity theorists from more than thirty countries shared their work and world views. The Partnership continues to expand, and as the network grows, so do the possibilities. This article (and the book inspired by the above mentioned conference: *Complexity Science and Social Entrepreneurship: Adding Social Value Through Systems Thinking*) is just one of the outcomes that have emerged so far. We believe that the greatest measure of success will be measured in human terms.

We also believe that this Partnership can generate a convergence of frameworks resulting in the discovery of new possibilities that are able to bring forth more positive social outcomes, marshal greater hope, and provide enhanced dignity to the disenfranchised. We envision these new possibilities as supplying additional, genuine support for the world's poor in having "an opportunity to climb out of the poverty trap"

(Prahalad, 2006: 99). This fortuitous meeting of systems thinking, complexity theory, and social entrepreneurship has the capability to transform the lives of those most in need, and thereby transform the lives of us all – or, in the words of the Reverend Martin Luther King, Jr., "We are caught in an inescapable network of mutuality, tied in a single garment of destiny. Whatever affects one directly affects all indirectly."

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