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A Self-Organizing Group Within a Hierarchical Organization

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A SELF-ORGANIZING GROUP WITHIN A HIERARCHICAL ORGANIZATION

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Abstract

This study was conducted to discover and describe the characteristics of a community of practice (CoP) and the health care system within which it formed. The study explored the relationship between a CoP of primary care physicians and a health care system that was both a hierarchical organization and a complex adaptive entity. It further examined the impact that relationship may have had on the organization's sustainability within its environment.

A qualitative approach was used for the collection and analysis of data. Semi-structured interviews were conducted with four members of the CoP and three members of their administrative hierarchy. There were two aspects to the data analysis: (a) development of themes emerging from interviews aligned with each of the research questions and (b) application of fractal narrative analysis to examine the degree to which each of the interviewees' responses contained content that was self-similar such that each contributed to the picture of the whole organization.

Findings illustrated the application of numerous complexity characteristics. These included (a) attractors that influenced the formation and continued cohesiveness of the CoP and fostered a dynamic tension in the relationship between the CoP and its administrative hierarchy, (b) sensitive dependence found in retrospect when the impact of the attitude and behavior of administrators was looked at in relation to the evolution and political influence of the CoP, (c) phase transitions and fitness peaks that characterized the journey of the CoP, and (d) fractality which revealed a strong alignment of values and beliefs between CoP members and administrators, creating a cohesive picture of the whole organization, but divergence in the two groups' approaches to realizing them.

This dissertation, written under the direction of the candidate's dissertation committee and approved by the members of the committee, has been presented to and accepted by the Faculty of the School of Education in partial fulfillment of the requirements for the degree of Doctor of Education. The contents and research methodology presented in this work represent the work of the candidate alone

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CHAPTER I: THE RESEARCH PROBLEM

Statement of the Problem

During the decade leading up to this study, health care organizations faced a constant challenge of balancing the traditional hierarchical order in which they operated with introducing and applying innovative approaches needed to keep pace with financial, technological, and administrative changes that characterized their environment (Institute of Bazzoli, 2005; Goldberger, 1996; Institute of Medicine, 2001). The sustainability of health care organizations in the communities they served was placed at risk when those organizations failed to adapt to the continuously changing environment (Nyhan, 2002).

The health care system in this study was a traditional hierarchical organization that faced extraordinary turbulence in its external and internal environments. These included external economic and regulatory pressures and internal equity and compensation issues for its employed medical staff. The sustainability of the organization was a challenge for its administrators who were tied to fidelity to the hierarchy and for its primary care physicians who created an informal group to change the status quo. Both the administrators and primary care physicians were committed to maintaining the organization's viability in its community and achieving equilibrium with both the internal and external environments. This study explored the pursuit of that equilibrium by looking at the work of the informal group within the hierarchical organization and used a complexity lens through which to explore the nature and impact of that relationship.

Hierarchy was used by health care organizations to define the structure and order for designating authority and responsibility. Such structures were in place to maintain stability (Fayol, 1916; Taylor, 1915) and were therefore relatively inflexible. Such

inflexibility achieved consistency and compliance with internal policies and procedures and external regulations, but may also have isolated these organizations and prevented their administrators and staff from recognizing the dynamics of the environment in which they operated (Levick & Kuhn, 2007). Additionally, hierarchies were in place to manage decision making by controlling the flow of information both within and between organizations. This was still the prevailing organizational configuration in the majority of mature corporations in the United States, in spite of efforts over more than 30 years to flatten hierarchies or incorporate more flexibility within them through the introduction of techniques such as self-directed teams and quality circles (Leavitt, 2005).

Similar to the majority of mature organizations, health care systems including the one in this study were organized with traditional hierarchical structures. This was their way of providing controls to assure (a) compliance with rules and regulations, (b) consistently high-quality and cost-effective care, (c) fair employment practices, and (d) appropriate facilities and equipment to meet staff and patients' needs (Knickman & Kovner, 2008). This organizational structure persisted through major changes in health care financing and reimbursement, increasing governmental and other oversight, technological advances in medical care and information systems, and changes in the number and types of staff providing care and support to patients (Institute of Medicine, 2001; Starr, 1982). With change occurring in nearly every aspect of the health care system environment, it was apparent that the health care organization that existed fifty or 100 years ago evolved and adapted to these changes while maintaining a traditional hierarchical organizational structure (Knickman & Kovner, 2008). What was not as apparent was the process or processes operating within the formal organizational

structure that modified the inflexibility and facilitated change and adaptation and enabled these organizations to continue to serve their communities.

Complexity science, when applied to organizational entities, may reveal one or more of those processes. Complexity science posited that organizations were complex adaptive entities that may adjust to, or evolve within, their environments through a process of self-organization and emergence (Capra, 2002; Gleick, 1987). Failure to adapt or evolve through the process of self-organization and emergence may lead to dissipation or dissolution (Prigogine, 1996). A complexity approach recognized that change is a characteristic of an organization's ongoing interrelationship with and adaptation to its environment. Organizations that have applied this approach recognized that change was not a periodic, planned event or something that was conceived and directed solely by a governing body and executive team, but rather an unending interaction that occurred at all levels (Tsoukas & Chia, 2002).

In the process of managing in an environment of ongoing change, organizations that have applied a complexity lens to understanding change, including those with traditional hierarchical structures, have achieved exemplary levels of sustainability (Hock, 1999; Peters, 1988). Examples include such long-standing organizations as Bank of America, Hewlett-Packard and the clothing retailer Nordstrom.

Within a complexity framework, self-organization may take place in novel and nonhierarchical ways. In some organizations, self-organization may take the form of communities of practice (CoPs), groups that form without managerial direction, to share information or solve problems within their practices (Wenger, 1996). The work of Wenger and others has demonstrated that the presence of CoPs can have a facilitating

effect on an organization's ability to change, even though the CoP is operating parallel to the formal hierarchy. One of the benefits of the CoP has been its contribution to innovation and knowledge management that can occur both within and between organizations (Brown & Duguid, 2001) . The creation and application of new knowledge was believed to be an important factor in organizational change, adaptation, and evolution (Argyris, 1996).

Roberts (2006) and Kerno (2008) examined the relationship between CoPs and conditions that foster them and concluded that further research on the relationship between CoPs and organizations' structures and cultures would further the understanding of the co-existence of CoPs and hierarchies. Both authors noted the specific relevance of this work to health care systems and the dearth of research that examined health care organizations as complex adaptive entities with traditional hierarchical structures and CoPs existing within those hierarchical structures.

Therefore, the research problem was to discover and describe the characteristics of a community of practice and the health care system within which it formed. The problem was further to explore the relationship between the CoP and the health care system that was both a hierarchical organization and a complex adaptive entity and the impact that relationship may have had on the organization's sustainability within its environment.

Purpose of the Study

The purpose of this study was to increase the knowledge and understanding of the degree to which a health care system, as both a hierarchical organization and a complex adaptive entity, recognized and fostered a CoP as part of its interrelationship with its

environment. It was also designed to further knowledge of the fractal nature of an organization as realized through its administrators and one of its CoPs. Finally, the study provided insight into the emergent characteristics of a health care system and one of its CoPs.

In this study, I used a qualitative approach incorporating the principles of complexity science for the examination of a CoP in a hierarchical health care system. I recorded and analyzed interviews with four members of a CoP and three members of the health care system's leadership team to improve the understanding of the formation and function of the CoP and describe the relationship between the CoP and its administrators. In addition, the analysis tested the self-similarity between the two groups and the implications of that relationship. The data sources consisted of semi-structured interviews with those individuals and selected print material consistently mentioned by interviewees.

Background and Need

In the 20 years prior to this study, nearly 1,000 hospitals in the United States closed, leaving communities to find health care elsewhere (American Hospital Association, 2008b). The majority of those closures were due to poor business practices rather than poor clinical practices (Deily, 2000). Those that remained open found ways to adapt to the changing business and clinical environment through innovation and adaptation (Paulus, Davis, & Steele, 2008; Salit, Fass, & Nowak, 2002).

In 2007, health care represented the largest sector of the U.S. economy outside of defense spending, with personal and government health spending exceeding $2 trillion, or 16 percent of the gross domestic product. Hospitals comprised 33 percent of the $2 trillion, which made them the single largest component of health care spending (Centers

for Medicare and Medicaid, 2007). The American Hospital Association estimated that the economic contribution of hospitals and their parent health care systems to U.S. communities was nearly $2 billion through employment of nearly five million people and related purchasing transactions (American Hospital Association, 2008b). Yet, within such extensive human and financial resources there was not a sense of stability but rather an embedded demand to react, respond, and reinvent. The industry faced extraordinary challenges to incorporate new technologies, create favorable reimbursement strategies, integrate new types of health care professionals, respond to increasing patient expectations, and comply with increasing government and industry regulations. Over a decade before this study was conducted, Duke (1996) observed that hospitals were struggling to "rethink and reorganize what they do, why they do it, how quickly they do it, who does it, and how it is financed" (p. 49). Richman, Udayakumar, Mitchell, and Schulman (2008) were critical of the health sector for its intransigence and referred to it as "strikingly ossified" (p. 1261) in terms of innovation compared to other countries' models of health care delivery. Yet the majority of the U.S. health care industry has adapted and endured.

Health care systems were both service and business organizations. Berry (2004) noted that there is an inherent tension in health care organizations in that they must generate sufficient funds to sustain and improve themselves, yet financial success cannot be the primary concern in caring for people who are ill or injured. The underlying rationale of a health care system, according to Berry, was to balance the business versus care-giving tension in a way that supported both social and financial profit. Social profit was defined as improvement in the quality of life for those served by an organization,

while financial profit was the monetary wealth an organization accumulated for its own improvement or that of its shareholders. This balance was one of the many dilemmas previously enumerated that health care systems faced in their pursuit of sustainability through adaptation to their changing environment.

Health care organizations were by nature rule-bound and hierarchical (Knickman & Kovner, 2008). While most people experienced only the admitting desk, the patient-provider relationship, and then the bill, those who delivered the care and those who supported the care-givers saw a very different picture. They worked in an environment that was governed by federal and state laws and regulations and industry standards that affected both the business operations and the delivery of care (American Hospital Association, 2008a). Hospitals and clinics had to be licensed to protect patients from harm; providers had to be licensed to assure they were trained, tested, and worked only within their scope of practice. Payments were controlled by state insurance commissions, federal Medicaid and Medicare regulations, and, to some extent, market forces. Labor relations were governed by labor laws and union agreements; working conditions were subject to federal occupational health and safety rules and the Americans with Disabilities Act. Even basic communication about individual patients was governed by federal regulations under the Health Insurance Portability and Accountability Act (HIPAA), a provision of the Social Security Act (American Hospital Association, 2008a; Knickman & Kovner, 2008).

A partial list of laws and regulations under which health care systems operated in California, the state in which this study was conducted, included the California Health and Safety Code and the Welfare and Institutions Code; California Code of Regulations,

Title 22 for hospital licensing and operations, Title 24 for building safety, and Title 28 for insurance regulation; the federal Social Security Act Title XVIII Medicare and Title XIX Medicaid legislation and associated regulations; Public Law 91-596, Occupational Safety and Health Act; and the federal Americans with Disabilities Act. These were just a few of the many controls on the delivery of health care that influenced the industry for over a half-century. Few questioned the need for careful and constant oversight (Salit et al., 2002), but some questioned the extent of regulation of the health care industry and even went so far as to say that excessive regulation caused unnecessary cost and disruption in patient care (American Hospital Association, 2008a). The consequences of a substandard physical environment or a poorly trained staff could be at best inconvenient and at worst deadly.

This attention to laws and regulations was part of the routine management function overseen by a hierarchy usually headed by a chief executive officer who delegated to a variety of directors and managers in a manner that held each responsible and accountable for their spheres of control. Success for these administrative leaders was defined as adherence to all of the aforementioned laws and regulations coupled with managing in accordance with internal policies and procedures through a system of accountabilities from staff to manager to director. Adherence was often measured by the lack of citations or deficiencies or financial penalties. The emphasis on regulatory compliance could have both inhibited and fostered creativity. The former would occur when there was strict adherence to regulations and the latter would occur when staff were encouraged to develop innovative work practices to more efficiently and effectively support regulatory compliance.

There has been a significant amount of change in the health care industry over the last century (Starr, 1982) with the advent of managed care replacing fee-for-service payment (Tuohy, 1999), the trend toward larger organizations, which occurred as a result of mergers and acquisitions (Bazzoli, 2005), and the possibility of some form of national health-care system reform (Oberlander, 2008). Increasing emphasis on clinical quality improvement (Walshe & Shortell, 2004), incorporating new technologies, the changing health-care workforce (Institute of Medicine, 2001), and the call for patient involvement in personal health-care decisions (Berenson et al., 2008) were all part of the panoply of circumstances that demanded ongoing change in the health care industry. Health-care organizations remained true to their hierarchical structures for decision making, which some have speculated was one of the reasons for hospital closures (Deily, 2000; Nyhan, 2002), financial failures (Burns, Cacciamani, Clement, & Aquino, 2000), and concerns about clinical quality (Walshe & Shortell, 2004). Each of these circumstances was part of the environment in which the health care organization in this study existed.

Each change introduced in one part of a health care organization had anticipated and unanticipated effects on other parts of the organization: for technology to be introduced, staff must be trained, there must be reimbursement for its use, the physical building may need to be altered to accommodate it, patients must agree that it is not too experimental, and the cost of introducing change must be outweighed by its benefits (Paulus et al., 2008).

The challenge for leaders in health care organizations was to understand the complexity of the internal relationships among discrete units such as medical and other clinical practices, administration and business services, and support services such as

housekeeping and engineering, and the external relationships between the organization and its network of health care providers, suppliers, payers, community members, and developers of new technologies, to name only a few (Paulus et al., 2008; Richman, Udayakumar, Mitchell, & Schulman, 2008).

In his landmark work, *The Social Transformation of American Medicine*, Paul Starr wrote:

> From a relatively weak, traditional profession of minor economic significance, medicine has become a sprawling system of hospitals, clinics, health plans, insurance companies and myriad other organizations employing a vast labor force. This transformation has not been propelled solely by the advance of science and the satisfaction of human needs. The history of medicine has been written as an epic of progress, but it is also a tale of social and economic conflict over the emergence of new hierarchies of power and authority, new markets, and new conditions of belief and experience. (Starr, 1982, p. 4)

Starr examined the evolution of medical care from its roots as a purely personal-service endeavor to its evolution into a multifaceted health care business and then to a complex industry sensitive to economic and market forces. In so doing, he set the stage for looking at the changing health care delivery system through a complexity lens while also recognizing the hierarchies that prevail throughout that system and between health care and its external environment.

Stacey (2007) looked at organizational adaptation as a function of the influence of individual interactions. He pointed to the need for leaders to recognize and embrace the concept of complex responsive processes that consisted of ongoing interaction among interdependent individuals without which their organizations could not truly participate in the inevitable change that emerged in predominantly unpredictable ways.

The dilemma for health care system leaders operating within traditional hierarchical structures was how to develop an awareness of the dynamics of the

interactions within their environment and the opportunities they had for adapting and evolving through the process of self-organization. To bridge the gap, Levick and Kuhn (2007) explored the concept of fractal-hierarchical organizations wherein each person, group, department, and division may be a self-similar component of the organization as a whole. Their position was that by taking advantage of the knowledge that lies within each fractal, and allowing that knowledge to influence the policy and direction of work, each fractal would release the energy needed to foster self-organizing and emergent phenomena for the entire organization.

Communities of practice, as self-organizing groups within hierarchical organizations, may be viewed as one of the avenues through which fractality can be identified. Wenger (2000) argued that communities of practice were the optimal means of developing the knowledge an organization needed to achieve its strategic objectives and thereby adapt to its changing environment. He recognized that CoPs often existed in hierarchical organizations that had the power to foster and support them or let them exist in parallel to the hierarchical structure.

Consequently, this study was needed to further the understanding of a community of practice and the degree to which a CoP, as a demonstration of self-organizing in a complex adaptive entity, was reflective of and integrated with the culture of the hierarchical health care system in which it was embedded.

Theoretical Foundations

This study was grounded in complexity theory applied to a business organization, specifically to a health care organization. Complexity theory as applied to business systems, which are a type of social system, was used as the approach to understanding

change and adaptation by looking at interrelationships among people within social entities and between those entities and their environments (Levick & Kuhn, 2007). This study focused on several aspects of complexity theory, which are explained in the general discussion below. Two of those aspects, self-organization and fractality are explained in more depth immediately following the general discussion. The section on self-organization narrows its focus to one form of self-organization unique to human organizations: the community of practice. The second aspect, fractality, is explored in theory and later through the degree to which the organization as a whole may be described through its fractals, specifically the CoP and its administrators who comprised its decision-making hierarchy. Finally, the theory of organizational hierarchy is discussed as the context in which the study took place.

Complexity Theory

Complexity theory moved critical thinking away from linear, mechanistic views of the world, where simple cause and effect solutions were sought to explain physical and social phenomena, to a perspective of the world as nonlinear and organic, characterized by uncertainty and unpredictability (Regine & Lewin, 2000).

The underlying premise of complexity theory was that entities in the chemical, biological, physical, and sociological realms were interconnected, interacting, dynamic, self-organizing, and either emergent or dissipative. They were known as complex adaptive entities (Stackman, Henderson, & Bloch, 2006) because these characteristics were associated with organizational evolution in concert with the environment. Their adaptation arose through a nonlinear, and therefore minimally predictive, set of events that occurred between an entity and its environment. It was through these interactions and

adaptations that an entity emerged and continued to exist. Maturana and Varela (1987) described this process as autopoiesis or the process of continual self-reproduction of an entity "through its own dynamics in such a way that both things [the entity and its environment] are inseparable" (p. 46-7). Complex adaptive entities emerged through autopoiesis and the process of self-organization, which was the realization of both their adaptability and the simultaneous changes that occur in the environment in which they operated.

Stacey and Griffin (2005) applied the theory of complexity science to business organizations in an effort to explain ongoing patterning of interactions among people working in those organizations. They summarized such patterning in three areas: (a) it was complex and unpredictable with a paradoxical element of predictability when patterns were observed over time; (b) it was self-organizing and emergent in unplanned ways; and (c) it was evolving based on the continuous interactions of individuals. Stacey and Griffin approached self-organization as a phenomenon that occurred primarily between individuals or within small groups as a means of maintaining group viability. One might interpret organizational change, from Stacey and Griffin's perspective, as the cumulative effect of the individual self-organizing activities that occur in one-to-one or small group interactions, with or without managerial direction.

Bloch (2005) presented an overview of the characteristics of complexity that were shared by entities whether they were described in the physical, biological, or social sciences. Bloch used the term complex adaptive entities (CAE), rather than complex adaptive systems, to portray more precisely complexity as greater than the interrelationships among systems. Rather, she indicated that complexity was the

interrelationships among individuals and networks that were not as neatly encapsulated as a system might be. Although systems may be entities, not all entities were systems. "Entity" was a term that encompassed more fluidity and adaptive qualities than "system," which took on a fixed, almost immutable quality. Bloch, and her subsequent work in collaboration with Stackman and Henderson, expanded Stacey and Griffin's three areas of patterning within organizations and identified 12 characteristics of complex adaptive entities (Bloch, 2005; Stackman et al., 2006). The characteristics are listed as follows:

1. Autopoiesis or self-regeneration that that takes place internal to an entity in concert with a changing environment.
2. Open exchange of energy between an entity and its environment.
3. Participation in networks within and outside the entity that dynamically expand and contract as conditions change.
4. Fractals or self-similar representations of entities at different scales. Every fractal is a representation of the whole to which it belongs and forms an organized scalar hierarchy with its upper level and lower level counterparts.
5. Phase transitions between order and chaos that are unplanned and unpredictable, but can be described through the patterning of actions over time.
6. Search for fitness peaks that indicated an entity is at a near-equilibrium state with its environment and will remain in that state for an indeterminate time or move to disequilibrium as the environment changes.

7. Nonlinear dynamics that characterized change through multiple network relationships acting upon an entity that defy a simple cause and effect explanation.
8. Sensitive dependence of a future state on conditions that occur at some point in the creation of that state. The point in time that is observed can change an infinite number of times, and each even small change can cause a large deviation in the outcome from the effect of a previous moment.
9. Attractors that limit growth as evidenced by repeating patterns of behavior resulting in phase transitions that are repetitive and inertial and do not demonstrate emergence or adaptation through self-organization.
10. Strange attractors that facilitated phase transitions to self-organization and emergence.
11. Spirituality or connectedness of entities that is characterized by a unity of forces.
12. Dissipative structures that no longer receive enough energy to adapt and may die.

Two of these characteristics, fractality and autopoiesis as demonstrated in this study through the self-organizing communities of practice, will be discussed in the following sections. They were included for their integral relationship to all research questions. The other 10 characteristics were referenced as appropriate in the findings and discussions section.

Fractality

Benoit Mandelbrot formulated fractal theory to explain mathematically the repetition of geometric shapes independent of the scale at which they occur (Mandelbrot, 1982). Mandelbrot's work was adapted to organizational theory (Levick & Kuhn, 2007; Malik, 2004) under the premise that groups within organizations can be fractals of the whole organization. The fractality of the group was realized through the similarity of its goals, values, and practices to those of the whole organization, and the organization can be viewed as a whole through its fractals. Levick, Woog, and Knox (2007) noted that "certain similar characteristics appear at many different scales and sites of focus, so it is possible to see similarities across these, although with varying degrees of precision" (p. 252).

Fractal characteristics may manifest in groups that are formal and permanent within an organization's structure, such as a business office or management team, formal but transient such as task forces or special purpose work teams, or informal CoPs that form, such as nursing supervisors from a variety of departments in the same organization seeking to improve communication. Levick, Woog, and Knox (2007) and Malik (2004) postulated that fractals could be observed in any organization. Levick et al. noted that when fractality is present it has the potential to reduce the rigidity of hierarchical organizations by "strengthening their employees' identity with the company… having the employees see themselves and the larger company as connected; the company's success is my success and my success is its success" (p. 272). One aspect of this study was to observe the presence or absence of fractality that existed within the organization as realized through the CoP and the organization's administrators.

Communities of Practice

Lichtenstein (2000) and Van Eijnatten (2004) looked at one aspect of complexity theory within organizations, that of self-organizing groups. They theorized that the presence of self-organizing groups could be related to the development of a learning organization and pockets of excellence, both of which were postulated to be linked to the ability of an organization to adapt to a changing environment and ultimately to its sustainability. A unique manifestation of self-organization in human organizations is the community of practice.

Etienne Wenger (1996), a social learning theorist, examined the concept of self-organizing groups and was the first to use the term "community of practice" as an example of self-organization. Wenger's definition of a CoP was a group of people who shared a concern or a passion for something they did and learned how to do it better as they interacted regularly (Wenger, 1998). Wenger recognized that CoPs are not a new phenomenon, citing guilds and trade organizations as examples of early CoPs. Through his extensive work with organizations ranging from telecommunications to health care, he developed a conceptual framework to differentiate CoPs from other communities (such as neighborhoods) and to clarify their boundaries. The framework consisted of three elements and three modes of belonging to a CoP. The elements of a CoP were (a) a collective understanding of the common practice that defined the group, (b) an intention to engage in the community and be trusted as a partner in the community, and (c) a knowledge and use of the resources the group collectively put together (Wenger, 2000). He stressed that an overarching principle of CoPs was that they were self-organizing and self-governing.

In addition, Wenger proposed that CoPs recognized the presence of boundaries of those participating in the community, that is, the boundary the community created, and the value of crossing individual or personal boundaries in order to participate in the collective community (Wenger, 2000).

Wegner theorized that the crossing of boundaries between or among CoPs could be instrumental as a means of coordinating perspectives within the larger context of an organization. He viewed these communities as learning opportunities and noted that the degree to which informal learning activities are recognized, respected, and encouraged distinguished a learning organization from one which is not committed to such an approach to managing its environment and its future.

Brown and Duiguid (2001) contributed to the body of theory on CoPs by proposing that the cohesiveness of each community is based on the commonality of its work (practice) and its tacit knowledge, which may grow from training or shared interest but is not defined by them. They noted that information exchange and knowledge creation were more commonly achieved within rather than between communities, specifically observing that:

> While accepting that firms may provide some degree of common culture for their members, it seems important to consider, for example, how much a CEO and a technician in a large Fortune 500 company really have in common… both are likely to have more in common with their peers in other organizations than with many of the other employees in their own (Brown & Duguid, 2001, p. 201).

It follows that managers of diverse services within an organization would have the potential to form a CoP for exploring general management concerns and that managers from distinct services within the organization (e.g., human resources, business office) would have the potential to form CoPs across organizations to explore management

concerns unique to their practice but that neither would integrate those outside their practice. This would infer that managers would not include vice presidents or line staff in their CoP, nor would line staff include managers within theirs, as this would not serve their purpose of delving more deeply into their unique practice. Brown and Duiguid's theory, therefore, strengthened the position that communities of practice can be looked at as a form of interaction between an entity and its environment, but begged the question of whether CoPs can function successfully to achieve broader organizational emergence within traditional hierarchical organizations.

Hierarchy

Henri Fayol, one of the 20th century's early management theorists, was credited with codifying 14 principles of management and embracing the concepts of unity of command, subordination of individual interests, and centralization of control (Fayol, 1916). In 1916 he identified hierarchical organizations as those that have a structure that identifies roles, functions, relationships, and lines of communication. His theory stated that the structure of an organization identified its patterns of authority in the supervisor-subordinate relationship and the associated rewards and sanctions that the supervisor could administer based on job performance.

The hierarchical organization has also been theorized to promote efficiency and effectiveness through the control of communication and decision making (Weber, 1964). Although many organizations have modernized the hierarchy by incorporating teams and horizontal as well as vertical participation in planning and decision making, this traditional hierarchical model has been the dominant model of organizational structure and operations throughout the twentieth and twenty-first centuries (Leavitt, 2005). Jaques

(1990) noted that, in spite of hierarchy's enduring quality over 3,000 years, critics fault hierarchy for excessive layering, lack of accountability, and stifling of effective leadership. He proposed that these weaknesses were due to lack of application of three elements of hierarchical management. The elements he proposed as delineators of hierarchy were: (a) giving preference to accountability over authority, (b) recognizing increasing complexity of the physical or mental task, and (c) incorporating time span of completion of the longest task into the ascending levels of a hierarchy. His theory was that levels of hierarchy separated by accountability, complexity, and time span for completion of the longest tasks would produce the greatest managerial value and organizational productivity. This study explored the influence hierarchy had on the formation and functioning of a CoP and the degree to which the CoP influenced its internal environment and organizational adaptation to the external environment.

Section Summary

The relatively new discipline of complexity science looked at entities as interconnected and undergoing a continuous process of change and adaptation to their environments through processes of self-organization and emergence. This approach may be applied to chemical, biological, physical, and social systems. When applied to social systems, and specifically to business organizations, a unique application of complexity theory has been proposed, that of recognizing self-organization as manifest through communities of practice that engage in knowledge generation as their contribution to adaptation and emergence.

A fundamental concept of a hierarchical organization was that information was formally channeled to the highest levels of the hierarchy for knowledgeable decision

making while a fundamental concept of communities of practice was that knowledgeable decision making was distributed throughout an organization and knowledge was created within groups that shared a common practice and passion for their work, even when they were within a hierarchical structure.

This study examined the juxtaposition of these concepts in a single organization by exploring the formation and functioning of a community of practice in a hierarchical health care system through the perceptions of members of both a CoP and the administrators that oversaw the system.

Research questions

The study explored a community of practice within a hierarchical health care system and was guided by six research questions:

1. What prompted the formation of the CoP in the study health care system and illustrated the principle of self-organization?
2. What conditions sustained the existence of the CoP in the study health care system and revealed attractors (such as organizational values and behaviors) that may have limited or facilitated the achievement of fitness peaks or organizational adaptation?
3. How did members of the CoP perceive their relationship to the hierarchy of the study health care system as illustrated through networks and open exchange of energy?
4. To what extent did the background of health care system administrators influence their attitudes and behaviors regarding the formation or function of

the CoP, which may be described through the process of nonlinear dynamics or sensitive dependence?

5. To what extent did the CoP contribute to organizational adaptation or change in the study health care system, from the CoP and system administrators' points of view?
6. To what extent was the CoP in this study a fractal of the culture or practices of the health care system in which it was formed and functioned?

A summary of the relationship among the research problem, purpose, theory, and questions is shown in Appendix A.

Definition of Terms

Administrator is an individual who is responsible for overall policy and strategic direction of an organization and the execution of those policies and strategies. He or she makes decisions regarding the allocation of financial resources that influence the human and capital investments of the organization.

Attractors are phenomena that appear to describe the nature of patterned fluctuations in physical, chemical, biological and behavioral change. They may lead to novel and emergent reconfigurations of entities or to repetitive but non-emergent activity.

Autopoiesis is the process of self-regeneration within an entity that takes place in concert with its changing environment (Maturana and Varela, 1987).

A *community of practice* is an informal group that shares a concern or a passion for something they do and learns how to do it better as they interact regularly. The group is self-governing and usually operates in parallel with an organization's formal

hierarchical structure. Members share a sense of identity on both individual and contextual levels (Wenger, 2000).

A *complex adaptive entity* is a physical, biological, or social unit that interacts with its environment and adapts to changes in that environment through a process of self-organization that results in emergence of the entity in concert with its environment (Bloch, 2005).

Complexity science is the body of work that encompasses the study of the ongoing and dynamic interactions between entities. It is an interpretive science that describes adaptation of entities that occurs when those entities respond to environmental changes and either emerge through a process of self-organization or cease to exist and go through a process of dissolution.

Dissipative structures are entities that do not adapt to changing environments and no longer exist even in a novel or adaptive state (Prigogine, 1996).

Emergence is the transformative state an entity attains after it has undergone a period of change and adaptation to its environment (Capra, 2002).

A *fitness peak* is a state of equilibrium between an entity and its environment that results in the highest degree of adaptability at a point or period in time.

Fractals are self-similar representations of entities at different scales, an example of which is a work group within an organization that shares the same values and behaviors as other work groups and organization leaders (Mandelbrot, 1982).

A *health care system* is a group of health care services organized and operated by a single entity. This may include emergency, outpatient, inpatient, and rehabilitation

services and the associated administrative and financial services that support the direct delivery of care.

Hospitalist is a physician usually trained in primary care who is responsible for leading the medical team caring for hospitalized patients. They generally are hospital-based and may be employed by hospitals or by medical groups.

Hierarchy is the organizational arrangement of authority where decision making is centralized at the top of the organization and communication must follow a chain of command (Fayol, 1916).

Innovation is a novel way of seeing or developing a different understanding that makes a new idea sensible and practical as a way to improve some aspect of human endeavor.

Leader is an individual who achieves organizational goals or tasks through guiding or directing to secure the cooperation of others. Leaders may derive power from their formal position in an organization or through informal assertion that produces desired results.

Nonlinear dynamics are forces that produce activity and change within and between entities; the activity is interactive, interdependent, and exhibits feedback effects that confound the identification of predictable future states (Regine & Lewin, 2000).

Open exchange of energy is the continuous flow and interchange of energy between an entity and its environment.

Organizational culture is the beliefs, values and tacit knowledge shared by members of an organization and manifest in patterns of behavior.

Organizational structure is the arrangement of components of an organization such as departments, programs and functions that define boundaries and relationship among them.

Participation in networks is the recognition of and engagement in the interrelationships that exist among physical, biological, or organizational entities.

Primary care physicians are medical doctors who are responsible for initial assessment, diagnosis and coordination of care which may involve directly caring for a patient or referring to a specialist. They receive post-graduate training in disciplines such as internal medicine, family practice or pediatrics.

Self-organization is the process of reconfiguring patterns of physical arrangement or social interaction in concert with changes in the environment. It is an aspect of change in an entity that may result in adaptation and emergence or dissipation of that entity.

Sensitive dependence is the influence that a small change in the equilibrium of entity at a point in time may have on the future state of that entity.

Limitations

The study was a qualitative inquiry into the formation and function of a community of practice in a traditional hierarchical health care system. The study was conducted in a single publicly-owned health care system with four CoP members and three members of the system's leadership team. CoP participants were all primary care physicians, all were founding CoP members who maintained their relationship and leadership positions within the group over its lifespan. The points of view of other primary care physicians who were not as active in the CoP were not included. This limited the breadth of information amassed, and the findings therefore cannot be

generalizable to other health care systems or CoPs. Three of the four administrators contacted for participation in the study agreed to be interviewed. The fourth did not respond after three attempts. As a result, the perspective of one of the administrators could not be included, even though that individual's role was mentioned by many of the participants. Additionally, the study spanned only a few months. Speculation by participants about future states is included when pertinent to the discourse, but validation of such speculation could not be captured beyond the termination of the study.

Significance

This study contributed to the body of research that explored the conditions that foster and support communities of practice in hierarchical organizations. It should be of value to organizational leaders who seek information on knowledge generation for the purpose of problem solving and practice improvement, both of which may be related to organizational adaptation and sustainability within a changing environment. It should also be of value to managers or staff who are interested in the work of communities of practice for their own benefit and growth. Much of the literature focused on CoPs from the point of view of those who had participated in them. This study's significant contribution was the examination of a community of practice within a hierarchical organization using the points of view of both CoP members and their administrators within the hierarchy.

Conclusion

This section presented the research problem, purpose, questions, and theoretical foundation for the study of a CoP in a hierarchical organization. Based on these concepts,

the following section presents literature that gives context to the research and provides a framework for contribution the study made.

CHAPTER II: REVIEW OF THE LITERATURE

Overview

The literature used in this study covered five broad topics: (a) complexity science and business organization adaptation, (b) communities of practice as agents of change, (c) measuring benefits and value of communities of practice, (d) conditions that fostered or inhibited communities of practice, and (e) hierarchy as a facilitator or inhibitor of change. Several of the studies were based in health care organizations, but the majority used non-health-care settings. Each study was chosen because of its value in illustrating points related to the five topics. The studies on CoPs included only communities that had face to face interaction as part of their usual means of communicating and excluded virtual groups that communicated exclusively through electronic media.

Complexity Science and Business Organization Adaptation

Complexity theory has been applied to a variety of private and public business organizations. These applications looked at the fundamental structures and processes that enabled organizations to adapt to their changing environments and in some cases to influence the environments in which they existed. Much attention has been paid to internal interactions and the culture in which those interactions took place.

Wollin and Perry (2004) studied the characteristics of complex adaptive systems using Honda Motor Company of Japan as a case study. They analyzed the company's market trajectory between 1970 and 1999 using publicly available records. Their analysis focused on nonlinear change and sensitive dependence to initial conditions, which they defined in terms of conditions influenced by the competitive market for automobiles. They postulated that in the multi-level structuring of rules that govern entities, marginal

rules are underlain by more fundamental rules. They equated fundamental rules to a company's beliefs, values, culture, technology, operating routines, organizational structure, core competencies, and distribution of power. Their contention was that, "If a fundamental rule is changed, then all of its related, more marginal rules will change. In contrast, changing a more marginal rule will usually not affect rules that are more fundamental; otherwise the system is completely unstable" (p. 562).

In their examination of Honda Motor Company, Wollin and Perry (2004) found that in the 1970s and 1980s the company dominated Japanese sales because of its attention to its fundamental rule of engineering excellence. The early 1990s signaled the start of a new phase of the company's existence when initial conditions relating to its adaptation to the U.S. market were altered by the entrance of two formidable Japanese competitors, Nissan and Toyota. This triggered a drop in Honda's sales, which the authors viewed as a nonlinear change in its evolution. Adaptation to these conditions took place through a rebalancing of Honda's fundamental rule of excellence in engineering with the rule of excellent customer service. This change positively affected the products and support services needed to sustain its position among domestic and international auto makers operating in the U.S. The authors concluded that the emergence and adaptation of Honda through recognition of and adjustment within these nonlinear dynamics was a clear example of a complex adaptive process.

Houchin and MacLean (2005) used complexity theory to explain how order developed in an organization. They studied a quasi-governmental organization over a four-year period, during which they conducted approximately 150 informal, conversational interviews with managers, three semi-structured interviews with corporate

management, participant observations, and the use of a personal diary from one of the authors who was also an employee of the organization. The authors incorporated four principles of complexity into their analysis: sensitivity to initial conditions, negative and positive feedback processes, disequilibrium, and emergent order.

The organization in the Houchin and MacLean (2005) study was formed as a publicly funded, privately controlled, environmental regulatory body. The structure was intended to support an organization with a strong center to hold the various components together, wide managerial span of control, high employee flexibility and delegation of authority to its lowest point, and an ability to serve as both a regulator and an influencer of policy and action. Although this organization began as one that recognized internal and external interdependencies and valued positive and negative feedback, during the four years of the study it went through a phase transition demonstrated through a period of disequilibrium and emerged as a traditional hierarchical organization. The authors concluded, “The present research… shows that destabilizing a social system such as an organization does not inevitably lead to novel forms of order” (p. 161). They attributed the reversion to a hierarchical structure as a mechanism to cope with the anxiety present during periods of disequilibrium and questioned whether the concept of an organization as a natural complex adaptive system that emerges in novel forms can ever be achieved.

Mitleton-Kelly (2006) studied the emergence of a complex adaptive entity through a case study of a quasi-public organization. She selected one of the 72 Training and Enterprise Councils in Great Britain, bodies that are responsible for workforce and related economic development based on local needs. The council in her study adopted a complexity approach to innovation, a process initiated by the managing director and his

team. They adopted an approach that recognized the complexity principles of connectivity and interdependence, self-organization, emergence, and co-evolution by doing away with or modifying the established concepts of plans, budgets, organization charts, targets, and objectives. These were reframed with processes that concentrated on connections and emergent patterns and the recognition that continuous innovative ideas take place at micro levels and may grow to a macro level if conditions allow. By moving away from their traditional ways of thinking and creating a new culture, the council in Mitleton-Kelly's study was recognized as the most cost-effective among the 72 councils and was the only one with a clear strategy that focused on outcomes and benefit to the region it served.

Taking a different path, Shoham and Hasgall (2005) used a qualitative research design to study fractality in six complex adaptive organizations, three private, three public. The authors conducted interviews with 60 employees (42 staff, 18 managers) to explore the relationship between organizational adaptation and knowledge management between staff and managers. They incorporated the concept of fractality and explained it as the relationship between individuals or groups and five characteristics of a complex adaptive organization. These characteristics were (a) synchronizations between the individual and organizational goals, (b) ability to cope with the environment, (c) decentralization of resources, (d) work process and knowledge transfer, and (e) self-development of individuals. Their findings "reinforced the claim that although each fractal in a complex adaptive system is independent in its ability to function, this functioning is meaningless without constant integration with the system as a whole" (p. 231).

Shoham and Haskall (2005) discovered that integration, or the realization of self-similarity at different scales, took place through tacit understanding of the differentiation of the role of the staff to function as a subsystem generating knowledge, solutions, and innovative ideas and managers to synchronize system-wide processes and allocate resources in response to the knowledge contributions of staff. Where there was demonstrated integration, in half the organizations studied, staff perceived themselves as fractals of the organization, effective knowledge management systems were identified, and these organizations developed as complex adaptive systems.

Stackman, Henderson, and Bloch (2006) examined three complex adaptive entities using 12 elements that synthesize the essence of complexity theory. The entities were quite diverse: (a) a group of nursing leaders focused on developing leadership skills, (b) a group focused on self-development using the Jewish practice of Mussar, and (c) members of a co-housing community, including one of its founders. The researchers' in-depth interviews yielded a wealth of information on the similarities among the organizations. The authors found that all began through a self-selection process, thrived because of a commitment to open exchange that supported participation, experienced phase transitions characterized by creativity that led to emergence, and exhibited fractal properties. Because two of the three entities, the nursing leader group and the Mussar, had members from multiple organizations come together to further a common interest and practice, the concept of fractality was particularly interesting. Members of these groups appeared to be pursuing conversations reflective of their larger groups and cultures.

Levick, Woog, and Knox (2007) applied a complexity framework to the design and analysis of their evaluation study of an interagency service organization and resource workers providing assistance for homeless youth. Their qualitative approach used semi-structured interviews with an unspecified number of senior executives to elicit narratives on the lived experience of participants in this work. They applied complexity principles of (a) attractors, to identify priorities expressed through shared values or commitment to the organization's mission; (b) fractality, to find similarities in experiences at multiple organizational levels; and (c) emergence, to find points of uniqueness and change.

While the study organization was not intentionally attempting to apply a complexity approach to its operations, Levick et al. (2007) looked at the operations through a complexity lens to provide an innovative perspective on the internal relationships and responses to the external environment that controlled the program's resources. One of their findings revealed that the attractor of competitiveness that existed before the interagency organization was formed had been replaced by a new attractor of cooperativeness that allowed the collaborative organization to consolidate power and influence its government funding. Another finding was that fractality demonstrated through expressions of shared vision, shared purpose, and overall goodwill resulted in the accomplishment of projects and tasks through the "creative well-being of the group" (p. 261). Emergence was found in the distributed leadership and management style of the new interagency organization, which was facilitated by the resource workers who appeared to be the "hub" of the network that led to frequent productive contact and open exchange between members.

In a study related to health care organizations, Forbes-Thompson, Leiker, and Bleich (2007) applied complexity principles to examine the differences between very high- and very low-performing nursing homes. Their premise was that nursing homes were complex adaptive systems, and as such their adaptation to their environment could be described through (a) attractors, including organizational mission and values, (b) the examination of relationships and perceived interdependencies (what the authors referred to as connectivity), (c) feedback mechanisms (information flow, in their terms), and (d) search for fitness peaks, expressed as cognitive diversity. They identified high-performing organizations as those as receiving three or fewer deficiencies from regulatory agencies and low-performing as receiving 10 or more deficiencies in their most recent inspection.

The study consisted of 30 hours of observation in each of four nursing homes to take note of staff working relationships and characteristics such as staff-to-staff interactions and staff-to-resident interactions. In addition to general observations, Forbes-Thompson et al. (2007) attended regularly scheduled care planning meetings and conducted 74 formal interviews with a broad cross-section of staff at each of the four nursing homes. The line in inquiry was focused on perceptions of working conditions and relationships. Finally, informal interviews and spontaneous conversations occurred, which produced insights into naturally occurring activities.

The authors' findings showed clear differences in approach between the high- and low-performing organizations, which the authors related to the former applying the principles of complex adaptive entities. In the high-performing nursing homes, complexity was illustrated through (a) managerial consistency between publicly stated

values and actions, which served as an attractor for positive staff behavior, (b) connectivity through trust and recognition of individual contributions within and between all levels of the organization, (c) information flow within the organization through the encouragement of both horizontal and vertical communication, and (d) support for the introduction, examination, and application of new and innovative ideas. In the low-performing nursing homes, “hierarchical behavior served to erode staff cohesion and trust needed for staff connectivity, the flow of information, and the sharing of diverse opinions needed to promote positive outcomes” (p. 348).

Section Summary

Complexity principles were applied to the study of many organizations as complex adaptive entities. The literature in this review covered a wide range of organizations from the for-profit international example of Honda Motor Company to a small public interagency organization serving homeless youth. These studies provided evidence that organizations exhibit features that can be described through complexity principles. The most commonly mentioned principles were open exchange and interdependence, attractors, fractality, search for fitness peaks, and emergence. When viewed through this lens, most of the organizations in these studies also show adaptation and resiliency. The one exception reverted from a flat to a hierarchical organization, which was thought to be attributable to anxiety during a period of disequilibrium and led the authors to question whether adaptation truly leads to novel forms of organization.

Communities of Practice as Agents of Change

Communities of practice (CoPs) have been studied in a number of settings. This section reviewed selected literature that described the development and contribution of CoPs primarily to business organizations.

Etienne Wenger (1996, 1998, 2000) is credited with the earliest work on communities of practice with his observations on knowledge-management in health care, telecommunications, and manufacturing organizations. In his collaboration with Foote, Weiss, and Matson in 2002, the researchers conducted multiple interviews with 32 people from eight pioneering high-tech companies and 12 software vendors to explore how best to access and contribute to group knowledge in support of high-performance decision making for organizational sustainability.

The authors found that decision-making needs varied across organizations, and that accessing individual and group knowledge had to be tailored to accommodate those needs. They cited one company's need for rapid response and problem solving, which required highly targeted communities with defined expertise. In contrast, another company's need was for new product development, which required a large group with broad knowledge and expertise. While both approaches were successful, they represented different forms of CoPs, a concept which was consistent with the fluid approach to emergence in complex adaptive entities.

Stackman, Henderson, and Bloch (2006) addressed CoPs in their study of three complex adaptive entities and found them to be present in and an integral component of each of those entities. They were able to discover and describe the elements of each CoP in their analysis as essential factors in the emergence of each entity. One of their key

findings was how the communities of practice within the three complex adaptive entities were able to redefine notions of success, leadership, and control in ways that fostered knowledge generation and sharing around common goals of their shared practices.

Plowman et al. (2007) set out to discover leadership behaviors in a faith-based organization undergoing a profound transformation from a historically exclusive upper-income congregation to one that incorporated a broad cross-section of the community. In the course of their investigation, the authors discovered that the transformation and emergence began with the interaction of a few individuals, not from the direction of the leaders. Their study consisted of semi-structured interviews with 16 representatives from the congregation including the co-pastors, congregation members, employees, and volunteers; semi-structured interviews with six representatives of the community including business leaders, city council members, and law enforcement officers; and secondary sources including newspaper articles, internal documents, web sites, and informal observations.

The interviews and document review in Plowman et al.'s (2007) study revealed a community of practice that emerged spontaneously when a few young congregants, out of boredom, decided to offer hot breakfasts to the homeless who walked by on Sunday mornings. This created the impetus for change, the process through which it could be accomplished, and the emergence of the faith community striving to reach a fitness peak by serving thousands of homeless annually. The congregation's leadership played a key role by creating the conditions that allowed for emergence and change. These conditions included: (a) supporting the disruption of existing patterns, (b) encouraging novelty and

innovation, and (c) facilitating sensemaking by interpreting change fostered by the CoP, rather than creating it.

Juriado and Gustafsson (2007) studied a community of practice that emerged quickly during the planning and execution of an inter-organization media event. The researchers traveled with the crew for five weeks through five cities. They conducted 31 semi-structured interviews with the event crew, each lasting 45 to 90 minutes. These interviews delved into roles, work practices, and relations among staff members. The authors also recorded observations of styles of communication within work practices and reviewed background information contained in each organization's internal documents.

The authors found that the CoP emerged in response to the complexity of the tasks and the need to share expertise quickly across the multiple organizations involved in the events. The crew was responsible for the set-up, execution, and disassembly of each event, a series of tasks that required coordination and a high degree of trust that each person would execute tasks independently or ask for and receive help when needed. The researchers gave this type of group the name "emergent community of practice" to signify a dynamic process of unpredictable patterning. They identified four cultivators of emergent CoPs including (a) knowledge sharing nurtured by different perspectives, (b) an atmosphere of trust that enabled different perspectives to be valued, (c) expertise shared through storytelling about previous experiences with similar events, and (d) the development of collective memories that facilitated the development of shared tacit knowledge. Ironically, the success of the initial event, in part due to the execution made possible by the CoP members' sharing of tacit knowledge, led to its becoming an annual event and the CoP moving from emergent to continuous.

In another view of CoPs, Pemberton, Mavin, and Stalker (2007) studied both the positive and negative aspects. Their approach included a review of pertinent literature and a recounting of their own experiences as members of a research-based CoP within higher education in Great Britain.

While recognizing the benefits of knowledge generation, creativity, innovation, and practice enhancement, Pemberton et al. (2007) also recognized seven potentially negative aspects inherent in the CoP. These included (a) the tenuous nature of the group, which was related to interest and motivation and could dissipate with the loss of key participants; (b) the delicate and difficult balance that must be achieved between guidance and authority for those that serve as the CoP's leaders; (c) the lack of transparency of CoPs within organization leading to resentment and mistrust, especially if the CoP has been making positive contributions to the organization; (d) the power struggles inherent in dynamic dialog that, if not well managed, can destroy CoP participation; (e) the insular environment that allows empowerment and open and candid expression may not be welcome outside the CoP, creating an unrealistic environment and generating anxiety among some members; (f) the tendency of some members to engage in imperialism and factionalism, creating an elite strata within the CoP that can be managed through the group's efforts or result in lost membership; and (g) the tendency to strive for a best practice, with its risk of narrowing focus and excluding valuable ideas, which can be tempered by the willingness of members to continuously seek to create new knowledge.

Pemberton et al. (2007) documented the benefits of CoPs from the studies they reviewed, yet cautioned, due to experiences they had with interpersonal relations and

intra-organization dynamics, “Keeping sight of some of the issues raised here may help to ensure that the pitfalls are avoided, thereby enabling CoPs to have a beneficial and positive effect on knowledge sharing and creation within organizations” (p. 72).

Finally, Paulus, Davis, and Steele (2008) studied the successful adaptation of a large integrated health care system to changing financial and quality requirements. They used internal documents to analyze the approach, which, since its inception in early 2005, called for the extensive use of CoPs and more formally-structured project teams. The CoPs consisted of volunteer and assigned participants who came together to design care models that were to deliver maximum health care value. The results of the work of the CoPs included improvements in accessing primary care, the introduction of a systematic approach to chronic disease management, and new models for acute care that included increased patient engagement in care decisions.

Section Summary

Communities of practice were studied in a variety of organizations and in general made a positive contribution to knowledge generation, an underpinning for organizations to interact with their environment, adapt and sustain themselves in novel and innovative forms. The positive effects were well documented, but one group of authors cautioned on the potentially negative aspects, with the intent of informing CoP participants so they may better manage or avert those negative possibilities.

Measuring the Benefits and Value of Communities of Practice

The measurement of the value and benefits of CoPs was a challenge for researchers. They were faced with little consistency in the form and function of CoPs, the type of organization and climate or culture in which they existed, and the purpose or

expected contribution. As a result, most studies focused on anecdotal narratives of the benefits to individuals, their work group or practice, and their organization, with little study on value in terms of cost-benefit.

Lesser and Storck (2001) looked at the contribution of CoPs to organizational performance by examining their relationship to the development and maintenance of social capital among community members. The authors studied seven companies from a variety of industries in which CoPs were acknowledged by their senior managers to be creating value. They conducted semi-structured interviews with 10 to 20 CoP members in each of these companies to probe participants' perceptions of value at both the individual and organizational level.

Lesser and Storck determined four areas of organizational performance that were positively impacted by the activities of the CoPs. These were (a) decreasing the learning curve of new employees, (b) responding more rapidly to customer needs, (c) reducing rework and re-creation of ideas, and (d) spawning new ideas for products or services. While the authors related these to elements of social capital, it may also be said that their findings related to, and supported the adaptability and emergence of, the entities that were studied.

In their 2002 qualitative study of nine communities of practice in eight firms, Millen, Fontaine, and Muller looked at the benefits and costs of the CoPs and the value to their host organizations. The firms represented a broad range of industries: finance, manufacturing, pharmaceuticals, software, chemical, and telecom. Analysis of interviews with more than 60 people, including members of nine CoPs and company leaders from the eight firms sampled, led to three areas in which costs and benefits were discussed:

individual, community, and organizational benefits. Individual benefits included (a) ongoing professional development, (b) improved reputation, (c) better understanding of others' work, and (d) increased levels of trust. Community benefits were identified as (a) increased idea creation, (b) increased quality of knowledge in advice and problem solving, and (c) creation of common context. Organizational benefits were found to be (a) improved communication among community members that contributed to successfully executed projects, (b) increased new business, (c) product innovation, and, of greatest importance to the leaders, (d) the time savings in performing information-seeking and -sharing tasks that contributed to improved operational efficiency.

Millen et al. (2002) used qualitative and anecdotal information to estimate the value of CoPs and found them to be positive. They also developed a quantitative framework to consider the cost savings and financial benefits of using the expertise of CoPs. They left the actual application of that framework to future research.

Archibald and McDermott (2008) recognized that previous work on the benefits of CoPs was largely anecdotal and carried that further with a quantitative survey given to 52 CoPs in 10 organizations representing oil and gas, aerospace and defense, technology, consulting, and engineering. They sought to measure the impact of communities of practice on both individual and organizational performance through a 10-minute online CoP-member survey. Participants were asked to rate over 20 questions using a 5-point scale to express their perceptions of the value of their CoP to themselves and to their organizations. They found that all CoPs scored significantly higher on supporting individual performance than organizational performance.

Further, Archibald and McDermott (2008) were able to differentiate those CoPs that felt they provided a significant contribution to individual and organizational performance from those that indicated little contribution. In follow-up interviews with an unspecified number of CoP members and leaders, the authors delved into the reasons for the differences in perceived contribution. The authors used correlation and multiple regression analysis of the information gathered in interviews to identify the specific factors that contributed to a community's ability to impact individual and organizational performance. The top four factors that supported high perceived contribution were (a) significant funding for face-to-face activities, (b) engaging in activities that addressed specific business issues, (c) receiving training in community leadership, and (d) having sponsors with high levels of expectations. Of these, they found that the strongest predictor of high performance was the level of funding provided for face-to-face interactions. The authors identified their work as a far-reaching approach that was intended to look more closely at different types of communities. To do so, they acknowledged the need to improve sample size and response rate, involve senior management, and explore key factors more deeply.

Section Summary

Little has been done to quantify the benefits of communities of practice. While the majority of studies that described benefits did so in terms of enhanced individual and group knowledge and improved work practices, Archibald and McDermott (2008) asserted that there was no standard way to quantitatively assess and compare the value of CoPs' contributions to performance. In the studies reviewed, only one conceptual format

was developed, but not applied, to assess cost-benefit and demonstrate the positive or negative impact a CoP may have on a company's performance.

Conditions that Foster or Inhibit Communities of Practice

Even in Wegner's earliest work, he recognized the limiting factors regarding the formation and functioning of CoPs. In his 1996 work in health care organizations, he found that CoPs can be "a source of problems – such as exclusion, inbreeding, narrowness – as much as a key to solutions" (p. 26). Wegner (2000) also noted the downside of CoPs, citing the qualities of trust, communal identity, and relationships drawn around a common practice that hold a community together also having the potential to devalue the experience because of an affinity for history and past achievements rather than a continuous view to the future.

Yanow (2002) used several case studies to illustrate practitioner communities, or those groups that share knowledge of work practices specific to a context in a period of time. She viewed this as tacit knowledge important to the practitioner community, but not routinely recognized for its value outside the community, a value of both technical and strategic importance to an organization. She identified two types of boundaries which these groups transcend: horizontal boundaries between similar practitioners and vertical boundaries along hierarchical lines but within a similar practice. Yanow described several reasons why practitioner communities possessing valuable strategic information may not be able to communicate it to an organization's management, including defensive behavior of the managers, managers' fear of showing ignorance, and managerial entrenchment in the established hierarchy of both decision making and implied knowledge.

Brodbeck (2002) engaged a focus group of senior managers within a multinational corporation of more than 12,000 employees based in Europe to provide insight into the development and co-existence of a CoP within the organization's hierarchy. He used the term "pockets of excellence" rather than CoP to facilitate understanding of the concept. He encountered general support for the concept but also found specific concerns, including the desire by the senior managers to limit the CoP's authority, a perceived need to give the CoP a charter and direct its activities, and a concern about the amorphous structure of a CoP limiting its ability to communicate with management or achieve its goals.

In two extensive studies using secondary data, Roberts (2006) and Kerno (2008) discussed environmental or contextual limits on communities of practice in the field of knowledge management and associated organizational learning, changing, and adapting. Roberts reviewed 55 studies and articles and concluded that "the context within which a community of practice is embedded is a major factor determining its success as a means of creating and transferring knowledge" (p. 634). Within the term context, Roberts identified the elements of trust, power, predisposition of thinking, size of the organization, the pace of change in the business, and its environment as having an influence on the degree to which CoPs acquired and shared knowledge.

In her discussion of power, Roberts noted the importance of the relationship between CoPs and the formal hierarchical structure of the organization in which they were housed and the boundaries between those organizations and the external environment from which they drew information. She found that the form and function of an organization-based CoP would likely be similar to that of the primary organization in

which it was housed, which was consistent with the work of Levick et al. (2007) on fractality within organizations. Her conclusion was that “pressures from internal sources such as directors and experts as well as from outside the organization can inhibit the will and ability of workers [in a CoP] to engage effectively in the negotiation of meaning” (p. 627). In an earlier study, Shoham and Hasgall (2005) had similar findings and stated, “It appears that knowledge management processes at traditional organizations, marked by a prolonged process of approval and decision-making, do not enable organizations to leverage the knowledge of employees in a highly dynamic environment” (p 227).

Kerno (2008) reviewed 35 studies and articles and, like Roberts, also concluded that the impact of hierarchy could be an inhibiting factor in the free flow of information among CoP members within and across organizations. His review found that organizational hierarchies “are at cross-purposes with communities of practices, and are likely to impede efforts for successful community of practice integration and utilization” (p. 75). He identified structural, ecological, and cultural forces likely to impair the introduction, implementation, and integration of a CoP within an existing organization. Primary among these forces was his assertion that communities of practice may benefit from a flatter, horizontally linked organization.

Both Roberts and Kerno mentioned the importance of time in the formation and functioning of CoPs. Time was applied to several aspects of CoPs: (a) sufficient time was needed for CoP members to engage in sustained discourse, (b) time was an important factor in establishing trust relationships, which in turn influenced the degree of engagement and participation, and (c) time was associated with the pace of change within

an organization; the need for extremely fast change was not conducive to the trust relationship needed to develop knowledge from multiple points of view.

Even though their study dealt with a very short timeline on a defined project to conduct a successful media event, Juriado and Gustafsson (2007) also mentioned the importance of trust grounded in shared practice. In their study, trust was built quickly but fostered over time as the project that brought the CoP together became an annual event.

Section Summary

Factors that fostered CoPs were consistently found to be the time to build trust and engage in discourse, the context that allowed communication to flow both horizontally and vertically, and the strength of fractality within an organization. Factors that inhibited the formation or functioning of CoPs centered on the elements of power, authority and control inherent in traditional hierarchical organizations and managerial entrenchment in the hierarchy. Communities of practice that managed the supportive factors well engaged in adaptive practices that contributed to their organizations' sustainability.

Hierarchy as Facilitator or Inhibitor of Change

In the majority of business organizations, the predominant organizational structure was the hierarchy. Harold Leavitt (2004) proposed that the hierarchy will remain the dominant form for discipline, oversight, and control for an indeterminate future. He proposed that organizations would continue to struggle with the dual needs of the "humanizers" who see humans as masters and organizations as their instruments and "systemizers" who see organizations as masters and humans as their resource. Resolving this fundamental dichotomy, he contended, may hold a key to better understanding how

hierarchies foster or inhibit organizational change. Leavitt proposed that managers within hierarchies exercise horizontal as well as vertical influence through connectivity, persuasion, and collaboration, inside and outside the organization. The following describes a collection of research that expanded on Leavitt's concept.

In their 1993 study, DiPadova and Faerman found that a sense of marginalization existed among managers in hierarchical organizations, but differed with respect to their level of management. In their study of 15 public organizations in New York State, they conducted 26 interviews with 67 participants spanning senior, middle, and first-level managers. The experience reported as the least interactive was that of the first-level managers. They did not see themselves as actively participating as innovators or making creative contributions to their organizations, in spite of recognizing that they had to continuously deal with change. In contrast, senior managers in this study saw themselves as dealing with turbulent economic-socio-political forces beyond their control, making decisions directed toward the survival of the organization as a whole. They often accomplished this without input from lower levels of their organizations.

All three levels reported a similar perception in dealing with change: that their approaches were constrained by forces they could not control. However, DiPadova and Faerman distinguished that "first-level managers are more often called upon to implement decisions with which they disagree and the external forces over which they have no control are created in part by upper-level managers within their organizations" (p. 157). They noted that the differences in perception among managers at each level of the organization were not undesirable by-products of hierarchy, rather they were

necessary to the organization's functioning and necessary to its recognition of the diversity of expertise across levels of an organization.

A manifestation of an organization's management of change may be found in the degree to which hierarchical companies strive to foster communication to empower managers and staff to engage in innovation and decision making regarding operations within their spheres of influence. In many instances this resulted in greater staff control over day to day operations and may also have an impact on organization-wide processes or strategic decisions. Psoinos and Smithson (2002) used a mixed method of data collection and analysis to explore employee empowerment in a sample of the top manufacturing companies in the United Kingdom. Results of their postal survey received from the human resource managers in 103 companies served as the springboard for the selection of participants in 17 companies for semi-structured interviews.

The majority (88 percent) of companies participating in the postal survey indicated they achieved increased employee empowerment as a result of a change initiative such as total quality management, business practice re-engineering, downsizing, or de-layering. Each type of initiative was directed and supported by senior management as a means of achieving organizational goals of quality, productivity, flexibility, or cost reductions in pursuit of future market position. Respondents also reported that the two most common constraints on achieving empowerment were the traditional division of tasks and the hierarchical management structure with the associated reluctance of managers to relinquish control. In-depth interviews revealed the need for strong support and encouragement from senior management to create the climate in which empowerment can be achieved. To this end, the authors concluded by acknowledging that

empowerment could not be realized unless members of the workforce believed that each of their personal contributions was important and that this message was consistently supported by decision-makers throughout the organization's hierarchy.

Tourish and Robson (2003) conducted a mixed methods study in a major European health care organization with 3,500 employees to explore upward and downward communication in a hierarchical organization. Their purpose was to explore the relationship between communication across hierarchical levels and organizational learning, corporate cohesion, and achievement of business objectives. They administered a communication audit with a randomly selected, stratified cross-section of 146 staff and complemented the audit data with six focus groups, each with six participants, and 15 individual interviews with a broad range of randomly selected staff spanning all levels of the organization's hierarchy.

Their findings showed that adequate upward communication within the organization was weak, often discouraged, and perceived by middle and first-level managers as a behavior emanating from senior management, although senior management was not aware of this perception. They found that job category emerged as a significant factor in their analysis, with middle managers indicating more exclusion from involvement in decision making than either senior management or first-level management. In this study, "evidently those with [the greatest amount of] power hang on to it while frequently lamenting the reluctance of subordinates to exercise more initiative" (162) thereby creating barriers to organizational learning, corporate cohesion, and the achievement of their business objectives.

Brazier (2005), in her work in organizational transformation of the United Kingdom's National Health Service, found that hierarchical organizational structures were likely to stifle creativity and innovation. She compiled data from 51 studies and reports on the influence that contextual factors had on power, influence, creativity, and innovation. Creativity and innovation were described anecdotally as the acceptance of new ideas and different approaches to defining and achieving work outcomes. She concluded that organizations with strong central control were looking to influence or even dictate future organizational states through singular leadership rather than influencing organizational behavior in ways that enhanced the odds of achieving productive futures. She noted that organizations that promoted flexibility and encouraged interaction among functions and hierarchical levels were more likely to stimulate innovation, but stopped short of concluding that a flexible environment was the only factor that produced creativity. Rather, she concluded that it was not possible to definitively say whether organizational climate causes innovation or whether being innovative leads organizations to become more flexible.

Nelson (2001) approached communication within hierarchical organizations from a different point of view. In his mixed methods study of 66 organizations to determine communications patterns within and between the top three levels of hierarchy, he found the pervasive use of "center-periphery" communication networks. Participants provided information on the number of face-to-face contacts they made with members of each of the top three levels of the organization's hierarchy. Rather than finding that most verbal networks followed along hierarchical lines, he found them to be tied to both an inner circle, or center, and a secondary periphery of contacts. Often the center-periphery

communication was the by-product of formal committees and project groups designed by managers to overcome the shortcomings of partitioning associated with hierarchy.

Nelson concluded that formal hierarchy and center-peripheral verbal networks may work in tandem, complementing each other's strengths and weaknesses. He further concluded that:

> High density face-to-face communication makes it possible to neutralize the centrifugal forces of bureaucratic specialization and to reach agreement, while personal ties to the periphery provide conduits for novel views and information and tacit knowledge that would not survive bureaucratic channels (p. 817).

Section Summary

The studies reviewed in this section, including both the empirical research and Brazier's review of literature and reports, looked at the relationship between hierarchy and the conditions that supported or inhibited organizational innovation and change.

The authors concluded that the majority of contemporary business organizations remain structured as traditional hierarchies. This gave managers and staff clear lines of communication and decision-making authority, but had a dampening effect on innovation and creativity. Four themes emerged from these works: (a) traditional hierarchical decision making and authority were consistently perceived as barriers to innovation, (b) creativity and innovation were more frequently reported by study participants in organizations that promoted interaction among functions, (c) support and encouragement from senior management for flexibility in decision making, expressed as employee empowerment, promoted innovation in the achievement of quality, productivity and market goals, and (d) hierarchical organizations that incorporated recognition of decentralized decision making and other forms of employee-driven innovation were able to accommodate these changes within their traditional structures.

Conclusions

Throughout the literature, CoPs were found within hierarchical organizations, and some were more successful than others. The strongest factors that were found to foster and sustain the development of CoPs included support and encouragement from the highest levels of the organization, trust within the membership and between members and other layers of the hierarchy within which they exist, and the pace of change in the industry and its environment (Foote et al., 2002; Kerno, 2008; Pemberton et al., 2007; Roberts, 2007; Wenger, 1999, 2000). In contrast, factors that were found to inhibit CoP formation and contribution included specific practices often identified as existing at middle and upper levels of a hierarchy. These included defensive behavior, fear of showing ignorance, and entrenchment in the established beliefs and practices concerning knowledge generation and decision making (Brodbeck, 2002; Kerno, 2008; Roberts, 2007; Yanow, 2002).

Although hierarchy was consistently found to be a barrier to communication and creativity (Brodbeck, 2002; Brazier, 2005; DiPadova & Faerman, 1993; Psoinos & Smithson, 2002; Robson, 2003; Tourish, 2003; Yanow, 2005;), there was some evidence that they can exist as complementary processes within a hierarchy (Nelson, 2001; Roberts, 2006) when CoPs were present, especially when the CoPs were fractals of the organization in which they functioned, thereby sharing elements of the organization's culture, especially its values (Shoham & Hasgall, 2005; Levick, Woog & Knox, 2007).

The breadth of literature reviewed supported the need for the continuation of research into the formation and function of CoPs as well as their contribution to organizational adaptation and emergence. This study addressed these points and included

as participants both CoP members and leaders of the large formal organization in which they worked. The inclusion of both groups was particularly important as it addressed both perspectives, an approach that was not consistently found in the literature.

CHAPTER III: METHODOLOGY

Restatement of the Purpose and Research Questions

The purpose of this study was to increase the knowledge and understanding of the degree to which a health care system, as both a hierarchical organization and a complex adaptive entity, recognized and fostered a CoP as part of its interrelationship with its environment. It was also designed to further knowledge of the fractal nature of an organization as realized through its administrative leaders and one of its CoPs. Finally, the study provided insight into the emergent characteristics of a health care system and one of its CoPs.

Research Design

The research used a qualitative case study approach to examine a CoP in a health care system and incorporated the principles of complexity science as the framework through which the inquiry was developed and analyzed. This was a case study and exploratory research conducted in a relatively new field. There were two groups of participants, members of a CoP and the administrators through whom they reported for organizational decision-making in the health system's hierarchy.

The case study approach was defined by Creswell (2003, p. 15) as an "in-depth exploration of a program, an event, an activity, a process, or one or more individuals in a situation bounded by time and activity, with data collected through a variety of procedures." Creswell's description accurately reflected the intent of this study to delve into the CoP and its hierarchical environment at more than a cursory level. Patton (2002) raised a foundational question underlying the case study approach: "How and why does this system as a whole function as it does?" (pp. 119-120). This was an apt description of

the line of inquiry that was taken when examining the CoP and equally appropriate when looking at that CoP in relation to the hierarchical health care system in which it existed. The study described the formation and functioning of the CoP and the relationship between the CoP and the hierarchy in which it existed as perceived by both CoP members and their administrators.

The study was grounded in complexity theory, which was characterized by a nonlinear approach to the examination of interrelationships described in the theoretical framework section of this dissertation. When applied to organizations, it may be used to examine those interrelationships both within a single entity and between an entity and its environment, with a view toward the effects interrelationships have on the adaptation of an organization to its environment. It was a process of discovery and explanation that was best captured through the qualitative process.

Emphasis was given to three complexity principles: self-organization as realized through a community of practice, emergence as the story of the evolution of the CoP unfolded, and fractality as demonstrated by the self-similar characteristics of the CoP, its administrators, and the collective recounting of the culture of the organization. Other complexity principles, including attractors, sensitive dependence, phase transitions, fitness peaks, and open exchange of energy were also examined and brought together with self-organization, emergence and fractality in Chapter V.

Data was collected through semi-structured individual interviews. This method was chosen because it produced a rich body of information on hierarchical practices, the formation of a community of practice, and the congruence, or lack thereof, between the two in the study health care system. It was a direct means of documenting the

development of the CoP and the role it played in adaptation to a rapidly changing environment that affected both the CoP and the organization in which it existed.

Semi-structured interviews comprised the largest part of the study. This was to provide the maximum opportunity to develop a description of the formation and functioning of the CoP and its environment directly from the information related by its participants. This was consistent with the fundamentals of the CoP, that it was through the sharing of information within the group, and between the individual members of the group and me, as the researcher, that the meaning of the group was discerned. Interviews were supplemented by examination of organization charts that illustrated the formal relationship between the CoP and its organizational hierarchy and the organization's mission and values statements, portions of which were referred to by the interviewees.

Population and Sample

Participant Recruitment

CoP Recruitment

The CoP was discovered with the assistance of the health care system's assistant director. I met with her to describe my research concept and asked her assistance in identifying individuals who were possibly involved in CoPs. She introduced me to a physician who I discovered was one of the founders of the Primary Care Interest Group, the CoP used in this study. Discussions with this physician over a period of several months revealed that the group had been in existence for about six years and that members would likely be willing to share their experiences and reflections about those experiences with me. Our discussions concluded with the physician offering to serve as the liaison to CoP members.

The CoP was an informal group of primary care physicians who named themselves the Primary Care Interest Group. They were employed by a large publicly owned health care system. Recruitment for CoP participants was originally conceived to be an open invitation to physicians in the 30-member group. This would have been followed by screening of respondents according to criteria contained in the research proposal. Selection criteria for study participants was to have consisted of individuals who were (a) able to grasp the concept of the CoP, (b) actively engaged in the CoP, (c) able to participate in a one-hour interview and one or two follow-up discussions of up to a half-hour each as needed, (d) willing to be candid about their experiences with the CoP, and (e) able to clearly articulate their experiences.

When I requested a list of CoP members from my physician liaison, she emailed three of her CoP colleagues with an introduction to the study to prepare them for their invitation. Physicians in the CoP contacted by my liaison were those she knew to be thought leaders, deeply knowledgeable about the CoP, and comfortable talking about its development and relationship to the health care system's hierarchy. She then sent me the names of those she had contacted and indicated that she would also be a participant. No additional names were received. I then sent an e-mail to each of those contacted by my liaison with the formal invitation. Three of the four responded by email within a week and interview appointments were confirmed. The fourth physician was re-contacted by my physician liaison to inquire about her interest in the study. The fourth physician then contacted me by email and an interview date was confirmed. This abbreviated recruitment process may have limited the breadth of perspectives on the CoP, but provided access to founding members with intense commitment to its formation and

functioning and direct knowledge of its relationship with the administrative leaders within its hierarchy. Samples of these emails with names masked to preserve confidentiality are included in Appendix C. I chose not to contact other primary care physician members of the CoP in order to respect the role of my liaison, the work she performed in facilitating the four interviews, and the opportunity for future contact with the CoP in follow-up studies.

Administrator Recruitment

Administrators were invited to be in the study based on (a) their position in the hierarchy, (b) their designated and perceived role in policy setting, and (c) their perceived influence on organizational culture and operations. Those invited were the Chief of the Ambulatory Care Division within the Department of Medicine (a physician), the Chair of the Department of Medicine (a physician), the Chief Medical Officer (a physician), and the Director of Ambulatory Services (a non-physician). Each of these positions was part of the health care system's hierarchy through which the CoP reported, thereby meeting the first criterion. Each invitee also met the second and third criteria as they all (a) participated in policy making for the health care system and (b) influenced and set the tone for encouraging or discouraging initiative and problem solving either through the established reporting structure or through informal channels such as CoPs. They exercised this at the system level through their influence on budget and related staffing decisions and work conditions. They also exercised influence at the operations level through the application of productivity standards for the use of professional time and their receptivity to ideas generated outside of formal lines of communication such as staff meetings and management-appointed committees and task forces.

The four potential participants from the administrative leadership group were contacted by email. The email contained a letter explaining the purpose and parameters of the study, an invitation to be a participant, and a request to respond by return email if interested. At the end of two weeks none had responded to the initial email. I sent a second email to the potential participants and copied each one's executive assistant. This produced responses from the executive assistants for the Chief of Medicine and the Administrative Director for Ambulatory Services, both of which resulted in interview dates. After an additional two weeks, the executive assistant for the Chief Medical Officer sent an interview date. After a third attempt, no response was received from the Chief of the Division of Ambulatory Care, and no further attempts were made to secure his participation. This resulted in a total of 3 rather than 4 participants from the leadership group.

Ethics in Research

In order to protect the privacy of the study participants, all names were changed in the written reports and summaries. The name of the health care system has been omitted and it will be described in general terms because the system's legal counsel did not give permission to use the name.

The physician liaison to the CoP who established the contact with the other physician CoP participants was not told of the status or content of any of the interviews. The participants from the administrative hierarchy were not told the names of other participants either from the leadership group or the physician group.

A code sheet with participants' identities and pseudonyms was prepared and kept in a secure location in my office, separate from the other research materials associated

with this study. All electronic files, including voice recordings, transcripts, and manuscripts were kept in password protected files on my personal desktop computer.

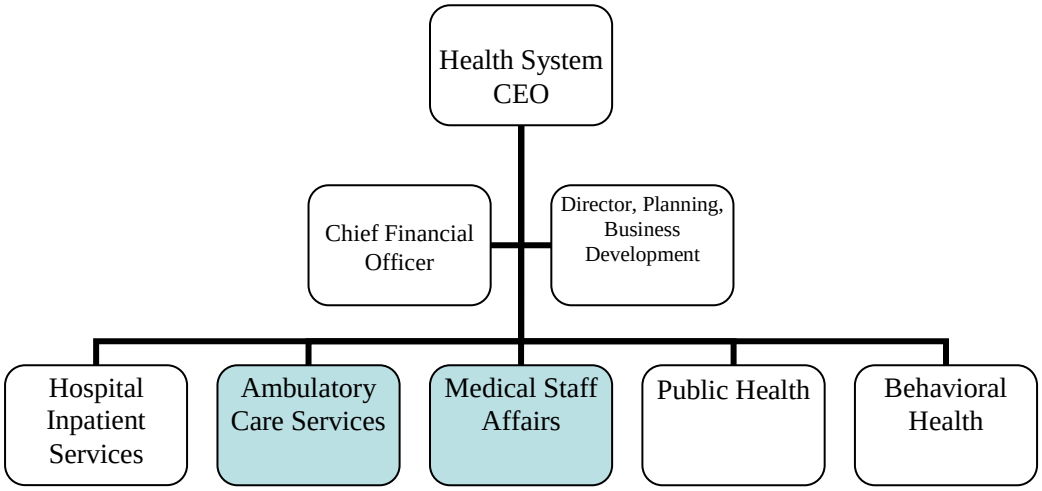
This research was approved by the University of San Francisco Institutional Review Board for the Protection of Human Subjects (USF IRBPHS). Appendix B contains the USF IRBPHS approval. In addition, the research was reviewed by the Institutional Review Board (IRB) of the study health care system. That body did not deem the study to be research as defined in its guidelines, thereby exempting it from the IRB's oversight. All participants gave written informed consent to participate. Appendix D contains the Informed Consent form signed by each participant.

Study Sites

Health Care System

The study took place in a large county-owned and operated health care system in northern California. The system was selected because of my access to its administrators and potential to recruit study participants. The system owned and operated a large multi-specialty hospital, a network of primary and specialty outpatient or ambulatory care clinics, public health services, behavioral health services consisting of outpatient drug and alcohol recovery services and inpatient and outpatient mental health services. Figure 1 is a diagram of the system components. The shaded boxes indicate in the system pertinent to this study

Figure 1: Organization Chart of the Study Health Care System

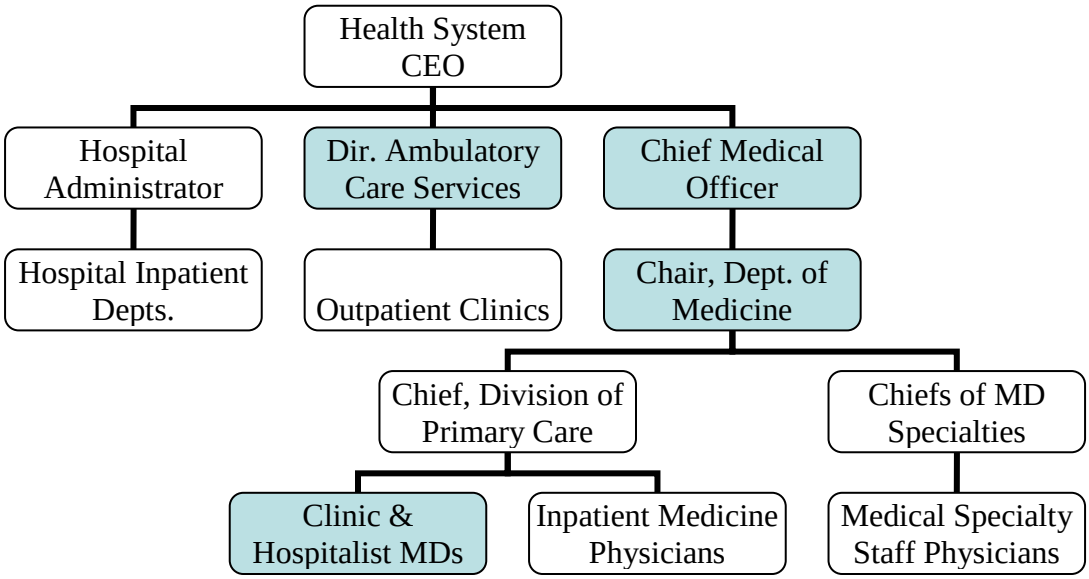


The health care system was founded in and operated continuously since 1876. It became a teaching hospital in 1905 with residency programs in primary care and numerous medical specialties. It demonstrated its ability to be a complex adaptive entity through the evolution of its programs and processes over its more than 100 year history.

A unique feature of the organization was that the entire 350 member medical staff was employed by the health care system. Other systems in its service area were served by independent community-based private practice physicians. The health system's medical staff played a variety of roles including direct patient care, research, teaching and supervision of medical residents. They also had opportunities to take on administrative responsibilities within their disciplines or programs. Another feature of the system was that it served the highest number of uninsured and publicly insured patients compared to all other health systems in its service area.

The health care system had a hierarchical structure that governed policy, decision making, and communication. It was led by a Chief Executive Officer (CEO) with a small group of directors who were responsible for the operation of each of the major components including the hospital and outpatient clinics. Embedded within the health care system's hierarchy was the medical staff hierarchy, which was created to assure medical professional oversight for compliance with the system's policies and medical staff rules of clinical governance and ethical behavior. The medical staff provided services to both the hospital and ambulatory care clinics and worked under the health care system's personnel and salary rules, but was assigned and overseen for clinical practice under medical staff rules. Figure 2 shows the relationship of these two hierarchies. The shaded boxes indicate positions of participants in this study

Figure 2: Health Care System and Medical Staff Hierarchies Related to CoP



The Hospital and Ambulatory Clinics

The hospital and ambulatory clinics comprised the largest part of the health care system in terms of budget, number of employees, and number of patients served annually. They were staffed with physicians representing both general practice and specialty medicine and surgery. The clinics were located throughout the system's service area in order to facilitate access for their patients.

The hospital and clinics were affected by changes that occurred as the health care system underwent significant organizational changes in the year during which this study took place. As a public organization, the system CEO was responsible to the County Executive. During this study, the County Executive resigned and was replaced by an individual with previous experience running a public health care system in a nearby county. Shortly after the new County Executive was hired, the hospital administrator resigned. This was followed by resignations of the health care system CEO and the directors of ambulatory services and planning and business development. Although all were replaced by interim appointees, these changes had a meaningful effect on the dynamic within the hospital and its clinic network and between the health care system and its external environment.

Study Participants

Community of Practice Participants

The CoP in this study met the fundamental criteria identified by Wenger (2000) of (a) sharing a common practice, (b) seeking to work with others who are equally passionate about the practice, and (c) centering their work on problem solving, improving the practice, or learning in order to evolve the practice.

The CoP was a group of primary care physicians that formed without being directed to do so by superiors within either the medical staff or administrative hierarchy. It formed initially under the name Primary Care Interest Group for the purpose of improving professional practice and, as the group evolved, its focus moved to solving problems related to working conditions, compensation, and the relationship between the entire medical staff and the health care system administration,. The group was a CoP within the medical staff's Division of Primary Care. The Division was the largest segment of the medical staff with approximately 75 members, 60 percent of whom were women. The CoP had 30 members and a regular attendance of about 20.

The four primary care physicians who agreed to participate in the study were women who had been in practice between 15 and 25 years. Two of the four hadcompleted their residency and practiced continuously with this health care system. One had completed her residency and practiced at a nearby private hospital for six years prior to joining the health care system's medical staff. One had completed her residency and practiced in another state for five years before joining the health care system's medical staff. One of the participants was a primary care physician practicing exclusively in the hospital, a position known as a hospitalist. The other three primarily practiced in outpatient clinics and also had time scheduled for hospital rounds for their patients or worked on an on-call status to back up hospitalists. Table 1 summarizes the characteristics of the participants.

Table 1

Profile of CoP Participants

Pseudonym	Gender	Years in practice	Years with study system	Primary Practice Site
Dr. Jones	Female	15	15	Clinic
Dr. Lyng	Female	19	13	Clinic
Dr. Lewis	Female	21	21	Clinic
Dr. Alinsky	Female	25	20	Hospital

Portraits of CoP Members

Dr. Alinsky (55 years old). Dr. Alinsky was the only hospital-based physician in the group. In addition to her internal medicine inpatient practice, she held the position of assistant professor at a large medical school, supervised medical residents, and engaged in research.

Dr. Alinsky offered to meet in her office, which was a converted hospital room across from a nursing station. She had created a warm and comfortable environment for her work by including a small couch and meeting table adjacent to her desk and bookshelves. Pictures of her family and world travels filled the walls.

She spoke deliberately and with an intensity that revealed her deep feelings for the work and accomplishments of the CoP. The words she used as she described the relations between the primary care physicians and specialists harkened back to those used in the first half of the twentieth century by labor and social organizers. She likened the primary care physicians to the proletariat and the specialists to the rich and powerful who

took advantage of the masses. Dr. Alinsky was the most outwardly activist member of the CoP and mentioned her personal goal of achieving equality within the medical staff throughout her interview. When she spoke of the relationship between the medical staff and health care system administration, her goal was to assure that the entire medical staff had a voice in decisions affecting compensation and working conditions.

Dr. Jones (46 years old). Dr. Jones was the youngest member of the CoP interviewees. She had a clinic-based internal medicine practice and also supervised internal medicine residents. She was one of the associate chiefs of the Division of Primary Care and one of the associate program directors for the internal medicine residency training program.

We met in her office in one of the health care system's larger outpatient clinics. It was furnished with a modular work station and mismatched chairs, personalized with a family photo and medical reference books. She seemed very comfortable in her surroundings. She mentioned that she always had the option of joining a private practice where she would earn more but chose to stay with the public system because it was more satisfying to be where she was serving patients who could not get care elsewhere.

She was a tall, slender, energetic woman who talked rapidly, used a lot of "filler" language such as "you know," "like totally," and "kind of." She talked passionately in long monologues about her belief that the CoP was making inroads to improving relations between the primary care physicians and health care system administration through its meetings with the Chief Medical Officer. She recognized that sometimes this occurred through short term accomplishments and sometimes by planting ideas that

would be used in the future. In the course of her interview she added a unique insight on the CoP's potential to change the power balance in the health care system when she said:

> You sort of realize the power that you have. It's bound by the tendency towards disorder and chaos and there's always that too of being fractious. So there's always the shadow side of it, which we often experience in meetings but when it does come together you realize the power of that.

Dr. Jones expressed her interest in advancing her knowledge of administration and broadening her knowledge of the external environment by sharing with me her intent to become part of a statewide leadership program sponsored by a major foundation.

Dr. Lewis (51 years old). Dr. Lewis was a soft-spoken person, small in stature but large in involvement in the health care system. In addition to her internal medicine clinic practice in which she specialized in care of patients with chronic conditions, she was involved in both clinical and non-clinical initiatives to improve patient care.

I was introduced to Dr. Lewis by the assistant director of the health care system, who indicated that this particular physician might be of assistance in my research. At our first meeting, Dr. Lewis indicated that she was engaged in more than one CoP and quietly brought up the Primary Care Interest Group as a potential subject for my research. She did not mention how strongly engaged she had been in its formation or how she had been one of its sustaining leaders. We met several times for coffee in the hospital's café and exchanged emails, which she fit in between her clinic work and numerous committee activities.

We met for her interview in a small conference room in an administrative office building rather than in her clinic office because the time coincided with other meetings she was attending. Although she was a practicing physician, she, more than the other CoP members interviewed, talked about her involvement in non-clinical activities including

the CoP and seldom mentioned her clinical work. She also spoke about her sabbatical and intermittent part-time status that allowed her to engage in the organizing efforts of the CoP.

A notable characteristic was her humility, evidenced through what she did not reveal during our conversations that I subsequently learned through what other CoP members said about her. Her CoP colleagues characterized her as dedicated, indefatigable, and courageous. They also talked about her husband, who worked for the health care system as a medical specialist and who was becoming a prominent member of the steering committee of the newly-formed physicians' union, one of the outcomes of her work within the CoP.

Dr. Lyng (54 years old). Dr. Lyng was a tiny Asian woman who spoke with a strong native Chinese accent. We met in her office in the same large clinic where Dr. Jones practiced. Dr. Lyng had personalized her office with comfortable side chairs, Asian art, and a collection of books ranging from internal medicine to acupuncture and traditional Chinese medicine.

She spoke freely about her personal reasons for engagement in the CoP process and how her motivation moved from improving working conditions for herself to that of her primary care group. She used her Buddhist and Confucian upbringing to explain her commitment to standing up for the rights of her colleagues in primary care and to set the stage for the young residents who would be entering practice. She reflected on how she had gone from "the quiet one" to the Kung Fu-inspired person who had to get involved and fight for what is just. In her words, "You have to have a conscience to do something; you cannot just stay away from trouble all the time."

Dr. Lyng was the only interviewee to mention the toll the working conditions had taken on her in terms of loss of sleep and weight. She was also the only one to mention the stress associated with the time she had to spend away from her family in order to fulfill her clinic and hospital responsibilities, even though she indicated that all the CoP members experienced the same work-family situation. She acknowledged that both she and her family had weathered the period of extreme working conditions and how important it was to her to prevent this from happening to her colleagues in the future.

Toward the end of the interview as she reflected on our conversation, she thanked me for helping her to realize some of the insights she had gained from her involvement with the CoP and why she had, and would continue, to work so diligently.

Only Drs. Lyng and Peters mentioned that the majority of primary care physicians were women and the totality of both the medical and administrative hierarchies was men. They did this in the spirit of accomplishment for women within an historically male-directed medical system, and did so without resentment or derisiveness.

Administrator Participants

The second group of participants consisted of members of the hierarchy within which the CoP operated. They were the Chief Medical Officer (a physician), the Chair of the Department of Medicine (a physician), and the Director of Ambulatory Services (a non-physician) who oversaw the outpatient services in which the majority of primary care physicians practiced. All three of the administrators were male and all had been with the health care system for over 20 years (Table 2).

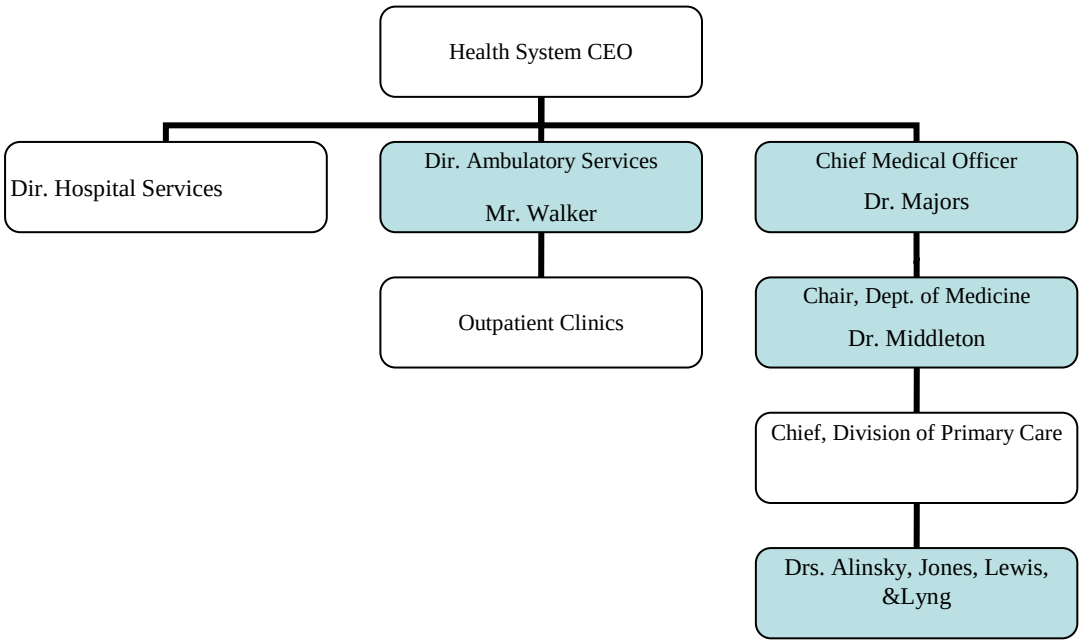
Table 2

Profile of Administrator Participants

Pseudonym	Gender	Years in profession	Years with the study system	Title
Dr. Majors	Male	30	30	Chief Medical Officer
Dr. Middleton	Male	31	22	Chief, Department of Medicine
Mr. Walker	Male	34	23	Director, Ambulatory Services

Figure 3 is a representation of the reporting relationships within the leadership group and between administrative leaders and their subordinates in the CoP. The shaded boxes indicate the position and name of each of the study participants.

Figure 3: Interviewees Reporting Relationship and Interview site



Portraits of Administrators

Dr. Majors (56 years old). The Chief Medical Officer was the only physician member of the health care system's executive management group and reported to the Chief Executive Officer. He had authority over medical staff policies and professional practices, budget, physician recruitment, and integration of medical practices in the hospital and clinic network. He was also a practicing primary care physician, seeing patients one half day a week.

Dr. Majors completed his residency and worked for the health care system for all 30 years of his practice. He started his practice as a staff physician in an ambulatory care clinic, and soon became physician-in-charge of that and other clinics where he was assigned. He was appointed Chief of the Primary Care Division, a position he filled for five years prior to his appointment as Chief Medical Officer. He said that his proudest accomplishments as Chief of Primary Care were to have increased the primary care staff from 20 to 60 full-time physicians assigned to the growing network of clinics and to have recognized a cadre of hospital-based primary care physicians as the first hospitalists. The system CEO appointed him Chief Medical Officer, a position he held for eight years at the time of the interview.

We met in a conference room across the hall from his office, which was located in an administrative wing of the hospital. He preferred this to avoid phone and email interruptions.

Dr. Majors was soft spoken and very fluid in his speech He seemed comfortable talking candidly about the personal conflicts he experienced as both a primary care physician and leader for the entire medical staff. He mentioned several times that he had

risen to the position of Chief Medical Officer with the support of both his superiors and subordinates, which he largely attributed to his collaborative style and managing by example. He had struggled and came to terms with having to speak for the needs of both primary care and specialist physicians, recognizing that, at times, he would have to take positions that were not fully aligned with those of his own practice of primary care.

His role as Chief Medical Officer was one in which he had to work with executives within the health care system as well as the county executive and the county Board of Supervisors. His choice of words at first seemed to be carefully selected to be politically correct. As the interview progressed he talked more candidly about relations with the interim health care system administrative leadership and the new county executive and seemed genuinely supportive of their approach to system leadership.

Dr. Middleton (57 years old). Dr. Middleton, a specialist in pulmonology and Chair of the Department of Medicine, had been in practice for 31 years, 22 of which were with the study health care system. He was elected and repeatedly re-elected to the Chair by staff physicians in the department and served in that position for 15 years at the time of the interview. He joked that no one else really wanted the job. In his role as Chair, he was responsible for day-to-day operations of primary care and specialty medicine, physician recruitment and retention, and oversight of medical residency training. He was a practicing physician and a member of the teaching staff.

I conducted the interview in his office which was a converted patient room in an administrative area of the hospital adjacent to a patient care wing. It was large enough to house a desk, files, bookshelves, and a meeting table where we held the interview. There

were a few pictures of colleagues and family, but the outstanding feature of the room was the wall of medical books.

Dr. Middleton was the quietest of all my interviews. He was thoughtful in his responses, but had to be encouraged and prompted to expand on each of his answers. Prior to scheduling his interview, we spoke by phone. He asked who would be reading my dissertation, in light of some recent newspaper articles in which the new county executive had admonished medical staff leadership for their lack of oversight of staff physicians' travel and education expenses. When I assured him that he would not be identified by name and that readers were my dissertation committee and other academics, he agreed to be interviewed. This was the only interview that was interrupted by phone calls. Dr. Middleton was on call for patient consultations during his interview and was obliged to take the two calls that came in during our hour.

Mr. Walker (64 years old). Mr. Walker, the Administrative Director of Ambulatory Services, was the only non-physician among the interviewees. He reported to the health care system CEO and was in charge of the budget, policies, and strategic planning for the health care system's network of primary and specialty outpatient clinics. Just prior to his interview for this study, he announced his retirement from that position after 23 years of service. After retirement he moved into a consulting position with the health care system as the principle in charge of major construction and selected expansion projects. His successor as the administrator of ambulatory services was not eligible to participate in this study as he was new to the health care system and had no knowledge of the CoP and only minimal knowledge of the hierarchical relationships in and culture of the health care system.

We met in the health care system's administrative office building in a small office he was using for his consulting work. Because he had only recently moved in to this office, and would be using it part time, it had standard built-in furnishings and no personal items.

Mr. Walker was a professional health care administrator. Discussion of his career began with his history with the study health care system. Unlike all the other interviewees, he did not volunteer information about his career prior to coming to the system. His first position with the system was director of an ambulatory care clinic. Within a year he was asked by the CEO to become director of all of the system's ambulatory care clinics. This was followed by the addition of overseeing the system's new managed care programs. He noted that his significant accomplishments were the expansion of the clinic system, the growth and refinement of the managed care plans, and the initiation of a major change in primary care delivery. That change consisted of transforming primary care from a patient-to-physician model to a patient-to-care team model. The goal was to improve the outcomes of primary care thereby preventing unnecessary emergency room use and hospitalizations.

Mr. Walker's language was reflective of his administrative background. He spoke often of trying to be strategic, to employ a service philosophy, to achieve operational imperatives like efficiency, and to give his managers the opportunity fail as part of their learning. As the interview progressed, Mr. Walker became more candid and colloquial. He talked about his relief that, now that he was retired, he would not have to deal with the budget and performance challenges that his colleagues in the administrative and medical staff hierarchies had to face.

Instrumentation

Data Sources

The primary data source for this study was semi-structured interviews and their associated verbatim transcripts. These data were complemented by notes written during or immediately following the interviews. These notes contained my observations on the context and environment of each interview. Examples of information contained in notes included the room in which the interview was conducted and the interviewee's demeanor.

Additionally, materials including organization charts and the mission and values statements were reviewed, the former to depict the reporting relationships among the interviewees, and the latter to relate interviewees' references to the health care systems' missions and values to those documents.

Interviews

Interview questions for each research question were developed to guide the semi-structured interviews and to assure consistency in the basic line of inquiry throughout the process. They were designed to open lines of inquiry that I could then use to go into more depth with each interviewee.

The interview questions and their relationship to the research questions are shown in Appendixes E and F. Appendix E contains the questions used as the guide for the interviews with CoP members; Appendix F contains the questions used as the guide for the interviews with the administrators.

Each interview began with a few general questions on the participant's background, followed by questions directly related to the research. The predetermined questions served as the starting point for a dialog that was tailored to the individual based

on his or her areas of interest and knowledge. The semi-structured nature of the process allowed each participant to answer candidly and to explore avenues of inquiry in depth as they arose during the course of the interview.

After the general questions about participants' background, interviews with CoP participants continued with a dialog on the story of their involvement with the CoP, including the role each took in its activities and their perceptions of the significance of the work to their practices, to the health system, and to them personally. They also described their observations on the CoP's relationship to the administrative and medical staff hierarchies. Administrators discussed their prior personal involvement with CoPs, their leadership philosophy and practices, their knowledge of the CoP in this study, and their perception of its contribution to the organization.

Additional Materials

The research proposal indicated that written documents would be used only if a participant made reference to information that he or she felt was important for developing context for a particular comment about the internal environment in which the CoP was formed. Six of the seven participants mentioned the mission and values of the health system and as a result I reviewed those documents.

I also obtained copies of the health system's organization charts to understand and depict the hierarchical relationships among participants. I reproduced the organization charts and replaced actual names with the pseudonyms of study participants to further aid in that understanding.

The Researcher as Instrument

Patton (2002) identified the researcher as the primary instrument in qualitative research because all information is collected, analyzed, and interpreted through his or her understanding, perspective, and biases. The strength of qualitative research is its process of inquiry, discovery, and recounting of an event or series of events in a manner that gives meaning and context. This study followed those principles, taking care to identify both events and context to the degree that the researcher could interpret them.

Because the researcher is the instrument, the researcher's background may influence what he or she sees, hears, and reads, and how that information is interpreted. My background in health care administration was both an asset and a challenge as I engaged in this research.

I worked in hospitals and related health care services administration for more than 20 years. In my role as director of business development in several hospitals, I gained tacit knowledge of organizational hierarchy as it is employed for decisions that apply to long-term strategic direction and daily management of operations. In both my planning and implementation roles, I participated in several communities of practice. The most relevant of these was one that focused on improving patient care through the use of integrative medicine. Although I did work for the health care system in this study, I did not work directly for the hospital or outpatient medical services in which the CoP formed nor did I have a reporting relationship with any of the system administrators in the study. Appendix G shows my position in the health care system in relation to those of the study participants.

I used semi-structured interviews extensively in my work in organizational development, which involved information gather for workflow analysis and redesign of work practices consistent with staff and organizational needs.

My formal training in qualitative research stems from an advanced research class taken as part of my doctoral program at the University of San Francisco. This gave me structured knowledge and experience in observation, interview, and analysis techniques. In addition, I employed these techniques in program development activities to support the business case for the start-up and evaluation of many health related services.

These experiences positively influenced my views of idea generation and working within hierarchies. My goal was to approach the data collection and analysis with an open and balanced line of inquiry and be aware of the influence my previous experiences had on that openness.

Data Collection

Each participant was interviewed once for approximately one hour and each interview was digitally recorded. Interviews were conducted with four CoP members and three members of their administrative hierarchy. All participants were interviewed during regular work hours. The location was selected by the participant and all locations provided a quiet environment with minimal distractions.

The schedule of the seven interviews was a function of the availability of each participant. Interviews were conducted over approximately 3 months. Each one hour interview took place in a private area selected by the participant. Two of the four CoP interviews were in the physicians' offices adjacent to their clinic practices, one in an office adjacent to the hospital's medical wing, and one in a small meeting room in an

office building housing some of the system's administrative functions. Each was selected by the interviewee to accommodate a clinical or administrative schedule. Two of the interviews with administrators were conducted in the participants' offices, one in the hospital and the other in the administrative office building. The third was held in a small meeting room adjacent to the interviewee's office in the administrative wing of the hospital.

At the end of each interview, participants agreed to be re-contacted to clarify or augment information if I felt parts were unclear or incomplete. Participants were thanked with a formal letter emailed shortly after the interview. Only Dr. Lewis was re-contacted to clarify some dates and timelines that seemed unclear.

All interviews were transcribed verbatim by a professional transcription service. That service operated under a confidentiality agreement prohibiting disclosure of the identities or content of any audio recording they transcribed.

Data Analysis

There were two aspects to the data analysis: (a) development of themes emerging from interviews aligned with each of the research questions and (b) application of fractal narrative analysis, which was specifically addressed in research question six, "to what extent does the CoP contribute to organizational adaptation or change in the study health care system, from the CoP and system administrators'' points of view?" Fractal narrative analysis as conceived by Kuhn and Woog (2007) and applied by Levick (2007) was used to examine the degree to which each of the interviewees' responses contained content, such as reference to organizational values, that was self-similar such that each contributed to the picture of the whole organization.

Coding Scheme

Each of the transcripts was reviewed for accuracy by listening to the recording while reading the transcript. Errors in specific words, phrases or word position were corrected and omissions were inserted. One transcript was particularly problematic due to the strong non-English accent of the interviewee. However, through this review process, most of the material was captured based on my ability to tease out the correct words from the recording and my notes. Grammatical and syntax errors were not corrected.

Using the corrected transcripts, I took an inductive reasoning approach and read each without any pre-conceived coding schema in mind, and let the coding emerge through repeated readings of the transcripts. Using this inductive method, I began by reading through all of the transcripts and making notes in the margins to identify recurring ideas. Throughout the second reading I color-coded statements that related to each of the research questions using colored highlighters to mark lines of text or whole paragraphs. When a statement could be applied to more than one research question, all relevant question numbers were noted in the margin adjacent to the text. Each research question incorporated at least one complexity principle. Therefore, when text was coded in relation to each question it was simultaneously coded to cross reference to one or more complexity principles. This work laid the foundation for more detailed coding that was captured in Excel spreadsheets. Use of spreadsheets allowed text to be grouped and compared by codes. This led to the assignment of sub-codes and in some cases the re-coding of material. It also facilitated the identification of the frequency with which comments were made in order to refine the coding scheme, leading to the development of patterns and themes emerging within the responses to each question.

The transcripts were verbatim, including colloquialisms and speech fillers. Quotes used in the findings and analysis were also verbatim, but edited for readability. The interviewee for whom English was a second language frequently used mismatched subject-verb agreement. However, the substance of the interview was captured in her verbatim quotes.

Within-Case and Cross-Case Analysis

Each interview was analyzed individually using a case analysis approach (Patton, 2002) and coded as described above. I took an additional step to help in my understanding of the material by mapping the CoP evolution processes and outcomes from the perspective of each group. Once complete, the text for all interviews was aggregated by codes and sub-codes within each research question and analyzed for patterns, discontinuities, or discrepancies. During this process I looked specifically at the patterns within and between the CoP and administrator groups to explore areas of convergence and divergence.

Fractal Narrative Analysis

In addition to within-case and cross-case analysis, the study applied a relatively new approach, that of fractal narrative analysis in the response to research question six. Fractal narrative analysis as conceived by Kuhn and Woog (2007) and applied by Levick (2007) is a way of viewing whether the components of an entity are self-similar and inform the picture of the whole entity. In the analysis, I described the degree to which the CoP and administrators used similar language to describe the health care system, its values, and its meaning to them. I then compared their statements to determine if they

were indeed fractals of the organization as a whole, allowing the whole to be found in its parts.

Kuhn and Woog (2007) applied fractal narrative analysis to social inquiry, noting that social entities "can be depicted as having fractal properties, where the smallest part represents the whole based on the understanding that the whole is always greater than the whole. Each fractal is a whole, but at a different scale" (p. 185).

Validity and Reliability

Validity in qualitative research is tied to the purpose and conceptual basis of the inquiry (Patton, 2002). The intent of this study was to explore the interrelationship between a community of practice and the hierarchical health care system structure in which it was formed, using a complexity perspective. It achieved validity by applying the concepts of dependability and authenticity to support its credibility. Dependability was achieved through recording and reporting the systematic process used for data collection, supported by documentation of the interviews and process for coding information from which patterns were developed. Authenticity was achieved through the reflexive process used for verifying information gathered and themes derived from that information (Patton, 2002). This included the semi-structured nature of the interviews that allowed me to introduce lines of inquiry that developed interviewees' thoughts in some depth, and the verification with the interviewees of those portions of interviews that were not clear to me as the interview was taking place.

The study was intended to contribute to the general body of knowledge about communities of practice and the conditions under which they form and function as well

as to continue the examination of the use of complexity theory in developing understanding of complex adaptive organizations.

CHAPTER IV: FINDINGS

Introduction

This study examined a CoP within a hierarchical organization to explore its formation, function, and contribution to the organization, and the relationship between the CoP and its organization. The study was guided by six questions:

1. What prompted the formation of the CoP in the study health care system and illustrated the principle of self-organization?
2. What conditions sustained the existence of the CoP in the study health care system and revealed attractors (such as organizational values and behaviors) that may have limited or facilitated the achievement of fitness peaks or organizational adaptation?
3. How did members of the CoP perceive their relationship to the hierarchy of the study health care system as illustrated through networks and open exchange of energy?
4. To what extent did the background of health care system administrators influence their attitudes and behaviors regarding the formation or function of the CoP, which may be described through the process of nonlinear dynamics or sensitive dependence?
5. To what extent did the CoP contribute to organizational adaptation or change in the study health care system, from the CoP and system administrators' points of view?
6. To what extent was the CoP in this study a fractal of the culture or practices of the health care system in which it was formed and functioned?

CoPs were groups that formed without being directed to do so. Within hierarchical organizations they formed without specific direction, request, or requirement by a person in a higher echelon of the organization. The CoP in this study was a group of primary care physicians who got together to address issues related to their work conditions and called themselves the Primary Care Interest Group (PCIG). The PCIG began five or six years before this study was conducted. Their story was the journey of a small group of primary care physicians responding to what they perceived to be inequities in their working conditions and compensation. They began, in the words of several interviewees with "whispers in the hallways" of their hospital. Their self-organizing gained momentum through budget reductions, consultants' recommendations to increase the size of their caseloads and decrease the size of their support staff, the entrance of a new county executive followed by the exiting of key health care system leaders including the chief executive officer, hospital administrator, and director of ambulatory services. The PCIG experienced several phase transitions and fitness peaks recounted in their interviews, among them the recognition of the influence they could exercise with their colleagues and their hierarchy by virtue of their work together and their significant role in the formation of a collective bargaining unit or union that eventually included the entire medical staff.

Each research question identified and explored one or more complexity principles. In most sections the perspectives of the PCIG members is presented first, followed by the perspectives of the administrators. When appropriate, comparisons or contrasts between the two groups are also presented. Question four inquired into the administrators' prior experience with CoPs and the influence that experience might have

had on their relationship to the PCIG. Therefore, the findings for this question include only the administrators' perspectives.

Participants did not use terms common to complexity theory such as self-organization or sensitive dependence, yet their interviews included their views on and experience with these principle. Therefore, in determining these findings, I made those associations based on the participants' verbal communication and the context in which the story was related. Additionally, two sets of terms were used interchangeably by the participants: (a) collective bargaining unit, CBU, and union, and (b) Primary Care Group, Primary Interest Group, its short form PIG, and Primary Care Interest Group. For consistency, I used the term union throughout the findings; the terms collective bargaining unit and CBU were used verbatim in participant quotes. I similarly used the term PCIG to refer to the CoP in this study, but incorporated other terms verbatim in quotations.

Research Question One: Origin of the PCIG

The first question brought the participants into the conversation by asking them to share their recollection of the start of the PCIG. This elicited very personal and sometimes impassioned versions of the origin of the PCIG and provided a clear example of a self-organizing group.

PCIG Members Perspectives

Although all PCIG interviewees had been part of the group from its inception, none could say exactly when it started. Consensus was that it was about five to six years old. The information each interviewee shared about the motivation for starting the PCIG

was summarized in three general areas, (a) perceived injustices, (b) powerlessness, and (c) ineffective communication.

Perceived Injustices

Interviewees consistently spoke of themselves as "worker bees" who were required to see a full schedule of patients in clinics and also see hospitalized patients, often resulting in 12-hour shifts. They worked alongside a group of primary care colleagues who were hospital-based, known as hospitalists, who did not have clinic responsibilities. Hospitalists had negotiated higher salaries than their clinic-based colleagues and received compensatory time for their on-call days. Dr. Jones recalled:

> One thing that we realized that there were a lot of inequities in our work schedule; that we covered in the hospital on the weekends and we didn't get any time off for that and of course our hospitalist colleagues had an elaborate system of being covered for that, and our hospitalist colleagues got paid more and our hospitalist colleagues didn't have to come back for clinic.

In addition, Dr. Lyng talked about her personal motivation for becoming a part of the organizing group for the PCIG. She was the only interviewee with extensive experience in a different health care system, and her observations grew from that as well as her introspection. Her first comment, spoken with a definite Chinese cadence and the syntax of a non-native English speaker, reflected her personal commitment when she said:

> There was lot of unfairness; there was a lot of injustice. But none of us ever brought up because we are such a passive group, we're just so noble we just sort of pay attention, go home, minded our own business and then when I get older, I feel like, God there is something not right.

Drs. Alinsky and Lewis echoed these sentiments and added the need to address the welfare of the entire group of clinic-based primary care physicians. Dr. Lewis's statement is representative of this position. She said:

> We were coming up with a way to make our lives livable on the wards and in a situation that was comparable to other people within our division.

The realization of these injustices led to conversations, mentioned by Drs. Lyng and Lewis as "whispers in the hallways" of the hospital to get a small group together to "sit down and talk about it and do something." The small group consisted of the four interviewees and was the beginning of the self-organized PCIG.

Powerlessness

Powerlessness was expressed most frequently as frustration in dealing with the leadership hierarchy and intimidation by both administrators and colleagues. Dr. Jones remembered the issues clearly when she stated:

> I think the biggest problem that brought us together was the sense that we didn't have a voice. We didn't have a seat at the table when important decisions either for our patients or ourselves in our work life would be made. So I really feel there was a lot of frustration and a feeling of powerlessness and of hopelessness, and how were we going to try to take some of that back.

Yet Dr. Lyng went on to say that the organization's culture, one based on leaders that had been trained and conditioned to the health care system's ways of interacting, also fostered inertia. She expressed her frustration with her colleagues' passivity and acceptance of the status quo by saying:

> Most of the doctors here were trained here, so this is a home grown doctors. So they used to the culture here. They didn't fight back. I was in [another system] for six years. Did that play a role that I didn't realize? In [that system] the physician was very well treated because they actually … they were heard. They have their own meetings. This is what they want to do, they got it. But here, we are second class citizens.

To counter the powerlessness, the PCIG proceeded cautiously. The first PCIG meetings were held secretly with a handful of physicians to put together a clear argument for recognition and equity that they would present to their division chief and department

chair. They attempted to initiate conversations between the clinic-based physicians and hospitalists and were stymied at first. The first threat to the group's existence came from a hospitalist who phoned Dr. Lyng and told her not to "dare ask for information about his group's compensation" and implied he could become less available for consultations and coverage.

This did not interfere with the PCIG's momentum. The group continued to meet weekly and, in Dr. Lyng's words, decided that, "we have a group, we are going to talk, this is not a secret." The PCIG developed its own leadership, and Dr. Lewis took on the role of director. She described the early formation of the PCIG:

> So the group was working and we actually started having meetings that became a standing meeting where once a month we would bring people from the different clinics to talk about issues. And they were patient care issues, they were, you know a lot of it was how do you deal with this? How do you deal with that? And we actually came up with a formal group and they actually elected a director, which was me.

The PCIG coalesced around overcoming powerlessness through a commitment to the open exchange of ideas. Dr. Lewis captured this by saying:

> We were coming up with a way to make our lives livable on the wards and in a situation that was comparable to other people within our division. Our meetings were much more open, rather than of a reporting type meeting. We came up with ideas of how to deal with referrals, inpatient-outpatient communication, and dealing with our time on the wards. But we really were the ones designing it.

Once the PCIG was no longer holding secret meetings, the founders, including the four physician participants in this study, kept leaders in the medical staff and administrative hierarchies informed of the general direction their work was taking. There were differences in perceptions among the CoP members regarding the support from their administrators and the progress they could make in achieving some balance of power in decision making. Dr. Lyng recalled that:

> The chief [of medicine] wasn't that supportive. He actually came from an inpatient manager [a hospitalist]. And in fact there's a lot of emotional thing happening with the inpatient managers that actually felt that we were prying into their, whatever deal they made and sort of by hurting their, whatever they started, I don't know whatever they started.

In contrast, Dr. Jones remembered the chief of medicine as supportive, that he "understood that there were problems and that he also felt frustrated in being able to deal with them."

Ineffective Communication

The third area that prompted the formation of the PCIG was ineffective communication within the Primary Care Division and between the Division and its administrators. Within the Division communication was complicated by the diverse locations at which the physicians practiced. Clinic-based physicians practiced at six locations while hospitalists practiced only at the hospital. Dr. Lewis recognized this and used the newly formed PCIG to facilitate problem solving by focusing attention on solving commonly-shared problems. She recalled:

> We were very aware that we don't communicate well and that we had to. The problem had been that we were all these little groups and we worked well within our little group, but what was good was that we each had…each clinic had solved the problem in a different way and so we'd share ideas of how we solved certain problems. So we … that's sort of where we were at the time.

Primary care physicians came together once a month at Division meetings which had planned agendas and little time for open discussion or off-agenda items. The structured agenda came from the Division Chief. Although he requested items from Division members, the majority of items were generated by the health care system's administrators in order to address issues such as budget, clinical policies, or legal issues. Participants pointed out that one communication issue that was not brought to these

meetings was one of reporting lines. Physicians worked within the medical hierarchy while nursing and other staff worked within the administrative hierarchy, yet both fell under the overall health care system structure. This led to conflicting practices, which resulted in new physicians working longer shifts with less compensation than long-tenured nurse practitioners. Medical leadership chose not to place this on the monthly Division meeting agenda, in spite of the concern it raised among staff physicians. Dr. Jones reflected on this situation:

> The salary thing was the realization that the nurse practitioners made more money than the primary care doctors. Now that's a little simplistic but that's the way it came across. Basically if you were a nurse practitioner who'd had enough seniority, you would make more money than a primary care doctor who was starting. I love nurse practitioners but there's a certain inequity in that physicians have more training and… but, mostly the idea was why does it happen… because the nurses union and they negotiate really nice pay raises for themselves, and here we are you know just kind of not being able to get it together, you know and, and function in the system and advocate for ourselves and not only for ourselves but for our patients.

The founding members of the PCIG were committed to expanding and becoming inclusive in order to become representative of the entire Division of Primary Care and foster open communication. They used email and phone calls to invite others to their meetings. This resulted in regular attendance of between 15 and 20 clinic-based physicians and one or two hospitalists. At larger meetings that involved critical decisions to be presented to medical staff and administrative leaders, attendance grew to 30 to 40.

Administrators' Perspectives

Unlike the PCIG participants who shared the startup experience that fostered the PCIG, their administrators were observers of that process who intentionally kept in communication but stayed apart from direct involvement. As such they indicated that they were aware of the general concerns that the primary care physicians had expressed

to them over many years. They also knew of the PCIG once meetings were no longer secret. In fact, PCIG members felt comfortable letting their administrators know of their activities. Each administrator acknowledged that the PCIG became a frequent topic of conversation at their administrative meetings. Dr. Middleton's comment was typical of their concern:

> This whole evolution of the primary care group with their practices, it's been the sort of thing we've probably talked about the most over the last five, maybe ten years.

Adminostrators' responses regarding why the PCIG formed fell into two groupings, (a) fidelity to the hierarchy and (b) powerlessness, the latter overlapping with the CoP interviewees' responses.

Position in the Hierarchy

Administrators were very aware of and sensitive to the position each held in the hierarchy and the influence this could have had on the formation of the PCIG. They spoke of the decision-making process they felt they had to uphold and the need to preserve their roles within it. Dr. Middleton noted that he did not always emphatically communicate concerns brought to him by medical staff because:

> Speaking loudly or more forcefully about things I think just would have broken down our credibility and communication chains with our leadership and it was really something that the group [the PCIG] had to do for themselves, I think in the end. I think it really had to translate that way because otherwise it was… It was much more clear who was speaking for who when they formed the group.

Dr. Majors, the Chief Medical Officer, recognized the limitations of his authority and influence within a health care system hierarchy. He continuously had to deal with competing priorities not only within the medical staff but also between the medical staff and all other components of the system. As a consequence of that limitation, he felt that

the PCIG could proceed more effectively on its own than by working through the medical staff hierarchy. He expressed this by saying:

> I would love to increase their pay. We would love to increase and have more medical assistants to help them in clinic to improve the efficiency, try to improve the front-end registration process, try to improve our electronic medical record systems, so it's faster and quicker, but those are all beyond the scope of what I can accomplish here and when you look at the individual primary care provider and their colleagues they're saying how best can we fix this and by organizing, they saw that as an option that they took.

Powerlessness

When administrators spoke of powerlessness, they mentioned both their lack of power and that of the individual primary care physician. In expressing his own frustration, Dr. Middleton, who identified himself as being responsible for advocating for the primary care physicians to the administrators, said:

> I think a lot of the reason that this [the PCIG] formed is because their superiors, specifically their division chief and me, their chairman, were unable to help them. In the sense that we were doing what we could but the issues just weren't getting addressed. So it wasn't out of disrespect for us or anything like that, we never viewed it that way, it was out of necessity. It was obvious that we weren't getting things done. That was clearly part of the dynamic that clearly went into their thinking.

Both Dr. Majors and Mr. Walker, the Director of Ambulatory Services, expanded the discussion of powerlessness of administrators to include influences from the external environment that posed threats to the growth and recognition of the practice of primary care. Dr. Majors expressed this through his acknowledgement of missed opportunities to be a stronger advocate for his own discipline, primary care. He noted:

> Unfortunately, given the finances, the hours, the support, we may not have supported the primary care physician as well as we should have, not only in this institution, but nationally. …. And if I look back, I should have been more proactive at that, but I also tell myself I was also looking in a milieu within a national type of situation, that that's the way it was, there was no change, and that's what we're in right now.

In contrast, Mr. Walker took a less contrite position and put the formation of the PCIG squarely on the influences of the external environment. He noted, “It was an overreaction to some of the political environment, not caused necessarily by administration, but caused by the external environment.”

Yet all agreed that whether it was internal failures of leadership or external forces, the powerlessness the primary care physicians expressed and that led to the formation of the PCIG was associated with fear and insecurity over job loss. Dr. Majors expressed it best when he said:

> And then when our new county executive came and made changes, in all honesty they [primary care physicians] felt very threatened about their security. And I think that was one of the things that, from my perspective, may be one of the issues that led to further organizational decisions. So there were multiple changes occurring a little faster, and with uncertainty comes much concern and when you’re able to get together and solidify, you’re able to represent your concerns much better.

Summary

The formation of the PCIG was a clear example of a self-organizing group. It arose from informal “whispering in the halls” about dissatisfaction with working conditions observed by a small group of primary care physicians who set out to change their situation. The founding physicians drew on the energy from the environment within their health care system. That energy brought their colleagues to the group and sustained their commitment to it. The PCIG was also an example of emergence in that it began as a small, single-purpose group to address issues of compensation and working conditions for only the primary care physicians and evolved into a group that engaged the entire medical staff in its work.

In the course of its emergence, it engaged in actions associated with adapting to an existing environment and changing that environment to reach a new equilibrium. Adaptation to the existing environment was illustrated by the PCIG's commitment to improving communication within its discipline. Through its initial organizing activities, it set a course for changing the equilibrium of the relationship between the PCIG and its hierarchy.

The self-organizing character of the PCIG functioned within a group of three strange attractors: (a) perceived injustices, (b) powerlessness, and (c) ineffective communication. These attractors were the context within which the PCIG focused its energy and formulated its actions. While there were specific outcomes identified by PCIG members, there was also recognition of meaningful accomplishments that constituted progress within the range of possibilities delimited by each attractor. For example, the first concession made by administrators to give compensatory time to primary care physicians for their on-call inpatient work was a step toward decreasing injustice in compensation, and their ability to articulate their concerns to their administrators was a step toward reducing their powerlessness.

Administrators shared one attractor with the PCIG, that of powerlessness. However, leaders also identified an attractor unique to their world, their perceived need to uphold the tenets of the hierarchy. Administrators were not identified as a CoP because they did not work together to further their practice. They did constitute a part of the environment in which the PCIG formed and functioned. Their attractors therefore framed the environment that influenced the energy and evolution of the PCIG.

Research Question Two: Conditions that Sustained the PCIG

Research question two contained two elements: (a) an exploration of the conditions that sustained the existence of the PCIG and (b) how those conditions revealed attractors that may have limited or facilitated the achievement of fitness peaks or organizational adaptation. In order to better explain the conditions that sustained the existence of the PCIG, I will first present the phase transitions, describe fitness peaks and organizational adaptation, and then describe the conditions that sustained its existence. The phase transitions, fitness peaks, and organizational adaptation section will be presented in its entirety from the PCIG's perspective. This is because administrators made very few comments on the group's evolution. Rather, they viewed the group's existence as an entity to be continuously dealt with, not as an organic or evolving entity responding to the environment that they in part created. The second section, conditions that sustained the CoP, will present both the PCIG's and administrators' perspectives.

Phase Transitions, Fitness Peaks, and Organizational Adaptation

The PCIG went through four phase transitions over its six-year history. Three of the transitions were associated with what the group deemed successes, while the other transition was seen as a temporary setback to their efforts. The PCIG sustained its existence through each phase transition. Study participants remained the core of the PCIG leadership, although their roles in that leadership changed over time.

The four phase transitions were: (a) the initial organizing effort of the PCIG focused on equity in work hours and compensation; (b) the expansion of the group from five to 20 members with a broader focus on participation in administrative decisions, (c) the further expansion of the group to approximately 60 members focused on creating a

labor union, and (4) the continued work of the PCIG on clinical issues outside the purview of the union. Each of these is illustrated below along with the associated fitness peak and emergent qualities of the PCIG. Fitness peaks are defined as the point or period during which an entity reaches equilibrium with its environment, and both the successes and failures of each phase transition fit that definition. Each of these transitions occurred in sequence, but there was a great deal of randomness to what is seen in hindsight as progression and adaptation to changing environmental circumstances.

Initial Organizing

Drs. Marvin and Lyng identified themselves as the first to engage colleagues and convene the first group meetings. They were also the ones to move the group away from secret meetings to meetings open to all primary care physicians, which attracted a few additional members equally committed to decreasing disparities between physician groups. The sheer success of their initial organizing effort was enough to sustain their interest in and momentum of the group. This was reinforced by the united position they were able to present to administration in the matter of parity between the clinic- and hospital-based primary care physicians. Their presentation to the leaders of the medical staff hierarchy and medical staff leaders' presentation to the Chief Medical Officer resulted in compensatory time for on-call coverage, reduced clinic hours on post-call days, and differential pay for unscheduled holiday work.

Expansion from five to 15 members

With the successes experienced in their initial organizing phase, the PCIG was perceived by their primary care colleagues as an entity with influence on what had previously been exclusively administrative decisions. And with the energy, particularly

from Drs. Marvin and Lyng, to communicate this success and bring additional physicians into the group, a consistent group of 15 to 20 regularly attended meetings. Their interest was to increase the cohesiveness as well as the size of the group as a show of solidarity.

Budget reductions throughout the health care system were a regular occurrence. At the same time as the group stabilized at 15 to 20 members, health system administrators brought in consultants to design and implement cost reductions. One of the consultant's recommendations was to increase the caseload of the clinic-based primary care physicians. The recommendation had been made with only minimal consultation with the primary care physicians and without conducting work-flow studies. It was nevertheless adopted by health care system administrators. The change was communicated to the physicians by the Chief Medical Officer and set off a strong negative reaction through the Division of Primary Care. The newly expanded PCIG felt genuinely empowered by its previous success and, in a meeting with the Chief Medical Officer, refused to follow the consultants' recommendation. This brought the CoP to a new level of cohesiveness and energy to continue to work toward changing their internal environment.

Expansion and Union Organizing

While pleased with the equity they had achieved within the Division of Primary Care and their stance against the consultants' recommendations, PCIG members interviewed for this study grew in confidence and wanted a seat at the table for future discussions on medical staff compensation and working conditions. As primary care physicians, they acknowledged that their wages were eclipsed by specialists, whom they often referred to as "high earners," such as anesthesiologists, radiologists, and

cardiologists. Because they felt marginalized and powerless in negotiations for wages and benefits and assurance that they would have sufficient staff and equipment to do high-quality work, CoP leaders rekindled discussions of unionization that had been raised a decade earlier. Interviewees used CBU interchangeably with the word union, and that will be reflected in their quotes. Dr. Jones summarized their incentive for proceeding by saying, "then I think we had a sense of, oh… we *can* make our life better."

While Dr. Lewis had been the primary organizer of the first PCIG activities, Dr. Alinsky rose to a position of leadership in the union organizing phase. Dr. Alinsky framed the union activities quite differently from Dr. Jones. She viewed unionization as necessary to achieving equity for primary care within a large multi-specialty medical staff. She had a definite vision and energy that she brought to the union discussions. In her words:

> So then, we went on our own and we made great headway, but that was our grassroots effort and that's what I was one of the leaders of getting this started.
>
> The Primary Care Group is considered the proletariat and the communist, and the anesthesiologists are worried that the Primary Care Group is going to take over the world because of their numbers and they will then make sure that everybody gets the same salary and the anesthesiologists will lose to the proletariat. So there has been a lot of that direct, open hostility and contentiousness against the evil influence of the primary care proletariat.
>
> So, it's always been the way it has been, that the people of power are the ones that are more vocal, have more money and feel like they have greater power and the primary care group has always been the poor masses.

As the PCIG actively pursued designation as a union, it encountered resistance from within its Division, hostility from the specialists, and discouragement from the Chief Medical Officer and Director of Ambulatory Services. Through all the contentiousness the group remained intact and grew to about 30 active members.

Concerns within the Division that were interpreted as resistance to unionization were expressed by Dr. Peters:

> We had a lot of trouble, even among ourselves, in getting organized. Everyone was thinking about themselves and what it would mean to them and what they would have to lose, but we did all of this initiation energy to get started and showed the rest of the world that nothing horrible will happen if we start a CBU, nothing horrible would happen, in fact we will be a little bit more recognizable, have a little bit more power even in the process of forming it. And nothing terrible will happen.

Other concerns came from Dr. Jones as she recalled her childhood when her mother, a nurse, was forced to choose whether or not to strike with her union. She put her colleagues' opposition to the union succinctly: "There were some people that felt like doctors should not be part of unions because it wasn't a doctor thing to do."

Hostility from the specialists arose from their disagreement with any sort of union activity and from fear. A typical sentiment was expressed by Dr. Lyng:

> We were told [by specialists] that we should not do it, we're going to lose our job overnight, the gyns and oncologists were very concerned that we were crazy to start a CBU.

Interviewees all mentioned the discouraging and sometimes threatening remarks from both the Director of Ambulatory Services and the Chief Medical Officer. During this phase, the Chief Medical Officer, who had been meeting regularly with the PCIG, cancelled those meeting on the premise that he could no longer find the time in his schedule. Dr. Alinsky summarized this hostility and disregard by saying:

> The administration had been telling us, over and over again, if you try to form this CBU terrible things will happen, terrible things will happen. You'll lose everything, you'll lose everything. You'll have to start from scratch, terrible things will happen. Don't do it. And this really had people scared and so we finally made it through that energy in order to get this thing started and that was enough for the whole physicians group to say ok well we can do it too.

The PCIG's petition on behalf of the primary care division to become a union was rejected because the division was not determined to be large or diverse enough to be representative of the entire medical staff. Drs. Lewis and Alinsky, with legal counsel, prepared for arbitration, which again resulted in the petition being turned down. Dr. Alinsky characterized the group's reaction:

> I was working at times even 24 hours a day and then we made it to the arbitration point and then we got turned down, and it was a big, big disappointment to us.

The PCIG rebounded and recommitted to pursuing the union, this time for the entire medical staff. At the same time, a new county executive was hired, followed by the departure of the health system chief executive officer, hospital administrator, and director of ambulatory services. Rumors were rampant that the new county and health system leadership would change the salaried physicians to contract associates, thereby changing their wages and benefits. These events brought the specialists and primary care physicians together to jointly pursue a union for the entire medical staff. Dr. Alinsky recalled:

> I feel like our foot work was monumentally important because physicians are so afraid of unions and so afraid of all of the horrible things that will happen that are just myths, absolute myths, given to us by the administration… that you have to start from scratch. But we had to go through all of the energy of dealing with all of our fears to push through it in order to make it to there.

While Dr. Alinsky was cautiously welcoming the specialists to the union organizing activities, Dr. Jones reflected on this turn of events and with a bit of irony said:

> So they [the specialists] were also with that threat that here's their colleagues who they thought were so foolish [to try to start a union]; well they're looking pretty smart right now, you know we're not so stupid after all, actually we're pretty smart, aren't we?

The union for the entire medical staff was approved. This brought mixed responses from the PCIG members. While they were pleased with the outcome and their role in making it happen, they also realized that the approval of a union was just the beginning of internal discussions and decisions on union bylaws, policies, and procedures. These discussions were being conducted by a steering committee dominated by specialists. Dr Peters' comment was representative of the PCIG's thinking:

> We are of two minds and I think even individual people are of two minds. I can use me as an example, I'm thrilled that we're getting a physicians' union even if it's all their [specialists] group, because even that in itself is a major, major hurdle, in order to get the physicians to have a voice.

Dr. Jones was cautious about the fragile nature of the new union, but was also optimistic in her view of PCIG's achievement. She quietly said:

> Right now I think, unfortunately we're still dealing with a lot of conflict and distrust and so it's difficult. Have we made progress? A little bit. We're still holding together through difficult circumstances.

Continued Work of the PCIG

The difficult circumstances that Dr. Jones referred to kept the PCIG in existence. PCIG members realized that it would take time for the union to become established and that its initial focus would be on wage and benefit concerns. The interviewees each noted one or more reasons that their PCIG would continue to exist. Dr. Lewis grasped the evolving nature of the CoP and explained:

> The primary care group will continue to meet to work on patient care and administrative issues at the clinic and hospital level, but wages and broad working conditions will be dealt with by the union.

Section Summary

The PCIG was sustained through four phase transitions that fundamentally changed its character. As it moved through each phase, it exhibited a fitness peak, or

equilibrium with its environment that was both short-lived and related to a subsequent phase transition. The initial organizing phase was characterized by a network that developed internal to the clinic-based primary care physicians. That small network was destabilized by an early success in its communication with its administrators, which gave the PCIG the momentum to increase in size and take on greater challenges. The second phase transition began with growth from five to 20 members and was energized by the threat precipitated by consultants and administrators of larger caseloads with no additional compensation. The PCIG-led refusal to go along with the increased caseloads once again destabilized the group by bringing its work to the attention of the full medical staff, which was itself experiencing threats to its compensation and working conditions from the administrative hierarchy. The third phase transition was characterized by growth to 30 members and an energy exchange between the primary care and specialty physicians that culminated in the formation of a physicians' union. This equilibrium was also short-lived as the PCIG found its group of primary care physicians elated by achieving representation and sobered by realistic expectation about their influence in the union, recognizing that their voice might be suborned to the vocal and aggressive specialists. The fourth phase was the recommitment of the PCIG to continued engagement in assuring an open exchange of information and energy with their medical and administrative hierarchies for the purpose of patient care and associated resource allocation decisions.

Conditions that Sustained the Existence of the PCIG

PCIG Members' Perspectives

Throughout their interviews, PCIG members noted both individual and group achievements that sustained the PCIG's existence through its four phase transitions and recounted specific events that turned out to be milestones in the group's evolution as well as underlying attractors that sustained their work together.

Individual Achievement and Personal Growth. PCIG members all experienced personal growth and satisfaction from their association with the group, but were genuinely humble and reluctant to take personal credit for any of its achievements. They usually preferred to use "we" instead of "I" when they spoke of achievements. At the same time, they were not reluctant to relate those achievements to their commitment to its continuation.

Dr. Lyng commented on the connection between her Chinese upbringing and the way in which the CoP helped her fulfill her destiny. She spoke at length about this, saying in part:

> I probably did a lot of work but I never felt that I overworked. I felt this was a good thing to do, this is a good cause. And I'm very Chinese in a way. It's the way I learned in a Chinese elementary school, high school is that someone has to stand up to injustice and somehow this is the way… maybe the way, this is my fate.

She evolved from being a self-described "quiet one" to a person of courage, prepared to stand up to her colleagues to ask for equity between the clinic-based primary care physicians and their hospitalist colleagues and later to become an advocate in the union steering committee for the needs of the entire Department of Medicine.

Dr. Lyng talked about how the power of the PCIG helped her fulfill her role first as a spokesperson for the Division of Primary Care and then as a member of the steering committee putting together the policies and procedures for the newly formed physicians' union. She noted:

> It's a very classic thing. How to balance my role to protect my department of medicine. And also, to fight for my primary care group, among all these things. And, how do I do my role as a representative? I have to keep a democracy. In a way, I have to turn to my Primary Care Group for advice all the time. Actually, I learn more, if I become humble in asking for advice, I get help.

Dr. Alinsky, who took a higher profile role in the creation of PCIG than Dr. Lyng, was instrumental in guiding the group through its union organizing activities. She felt she had stepped in where her energy and talent were best matched to the PCIG's stage of evolution, when it was growing and changing into an advocacy group that would ultimately work in conjunction with the entire medical staff. After the PCIG had guided the unionization process, Dr. Alinsky remained an active member but let her PCIG colleagues take on the detailed work of defining and bringing the union to life. The condition that sustained her commitment is embodied in her quote:

> I kind of feel like without my individual leadership as the incentive, I was the spark to get us through this point, but now I'm allowed to sit back and say now it's going to go, and I feel honestly feel like if I wasn't there physically pushing in the beginning, we wouldn't have gotten this far. So I think that's a major accomplishment and it wasn't just me, but it was me pushing the Primary Care Group and then the Primary Care Group getting together, but I was the one who was being … I was sort of the whip in the beginning and now I can sit back and let everybody else continue.

Dr. Lewis, one of the first to whisper in the hallways and encourage participation in the PCIG, was more circumspect in her comment about personal gratification:

> It's a way to help colleagues and to have colleagues help each other. It has turned the group from feeling helpless to actually making changes.

Finally, Dr. Jones, who had the fewest years in practice, emerged from clinic physician to advocate within the Division of Primary Care. She had been part of the PCIG from its inception, initially as a participant and later as one of its leaders attending meetings with the Chief Medical Officer and others in the health care system administration. Her perspective was:

> I realized again that we have a lot of power and so now it's us. We're still holding together through difficult circumstances … and I think that's because of the relationships that we've built in doing this work.

Group Achievements. The second condition that sustained the PCIG's existence was the series of successes the group experienced in achieving its purpose. The earliest success was the concession the PCIG received toward equity in hours and compensation between clinic-based and hospital-based primary care physicians. Dr. Jones described it this way:

> We sort of realized this was totally unfair and nobody's ever done anything about it and we're just stupid to keep doing this and it's kind of like we're idiots not to do something about this and so what some of my colleagues did is they brought this forward. They must have brought this forward to our division chief and they came up with a plan of what would be equitable and basically it went through and, all of a sudden, we were going to get comp time for doing weekends or we got a ward schedule that made a lot more sense or was a lot more equitable and then I think we were kind of like "Wow! What happened?" In order to achieve that, we had to kind of come together on that.

Commenting on the same early success, Dr. Lyng said, "That's the first thing they gave in. So we said 'Oh God,' we were so thrilled. This is because of the Physicians' Group that we got a lot of things done."

Dr. Lewis recalled a subsequent success in which the PCIG prepared a rebuttal to a plan prepared by consultants that would have required clinic-based primary care

physicians to increase their daily caseloads from 19 to 24. The PCIG's position, as a group, was that this would compromise the standard for patient care. Dr. Lewis remarked:

> Nothing happened until we refused to go along with the consultants' recommendations and he [the Chief Medical Officer] agreed to our position and took that to the administrative team, which went along with our action.

Dr. Jones also mentioned the continued need for the PCIG to exist and serve as the forum for the development of ideas and positions to bring to the attention of its hierarchy. She expressed concern that, as new administrative attempts at achieving greater efficiency in patient care were developed, there would not be sufficient resources to maintain high quality care. One of these was a "medical home" initiative that would provide a physician-nurse-patient educator team to patients with chronic conditions that she feared would be under-staffed. She commented:

> There are so many concerns and problems and issues that we always have, so now the thing is the medical home model. We have coalesced around the CBU and were excited about that and then the medical home has introduced conflict. I guess at this point I'd say it's [the PCIG] essential.

Dr. Lyng saw the value of the continued existence of the PCIG for its power to generate ideas, solve problems, and command time with administration. She noted that since the approval of the union, the Chief Medical Officer had re-instated his monthly meetings with the PCIG, which she viewed as a sign of success and momentum to keep the group together. In her words:

> The Physicians Interest Group still, we have meetings every month. We talk about the issues with our practice, we share our ideas and then we have meetings with Dr. Majors every month. This is our P group meeting. We still have it going on right now. And Dr. Majors, he's not cancelling.

Administrators' Perspectives

The administrators also had a few comments on the cohesiveness and longevity of the PCIG. A comment by Dr. Middleton was representative of administrators' feedback, in which he said:

> It's very unique in my experience to see such a group get together like that and have such staying power, it is very unique and I've never seen it before. They've been very committed, probably because a lot of their issues just don't go away. Quite unique.

Dr. Majors mentioned the group's sustainability as being attributable to the strength they achieved through their group cohesiveness. He noted that the PCIG managed its changing environment by saying:

> So there was multiple changes occurring a little faster, and with uncertainty comes much concern and when you're able to get together and solidify, you're able to represent your concerns much better.

Mr. Walker recognized the importance of group solidarity and longevity, which he also attributed to the lack of trust of administrative decision-making processes and the accompanying instability. He noted:

> And the physicians felt insecure, which I, believe me, I understand why they felt insecure. Many of the physicians, particularly rank and file, did not necessarily trust our rendition of the events [given by leaders], you know, it's based … usually the formation of a union is based upon the fact of security and protection.

Summary

Two categories of attractors that sustained PCIG members' interest and commitment were identified: (a) individual achievement and personal growth, and (b) group achievements. Each interviewee shared her personal reflections on experiences associated with individual growth. Although the specific experiences differed, two common attractors inferred from the interviewees' stories that related to personal growth

were (a) achieving a personal belief in her power to make changes and (b) the overcoming of fear that kept each of them from acting or exercising that power. Another attractor, mentioned only by Dr. Alinsky, was the pairing of unique talents with specific work to be accomplished by the PCIG.

The category of group achievement was further refined and illustrated to explain that the PCIG as a group was motivated and sustained by the attractor of power in several forms. Initially members' recognized that through the group they could achieve power in the decision-making process previously dominated by their leadership hierarchy. They also recognized the fragile nature of their power as they entered into the alliance with their specialist colleagues who had the majority of positions on the union steering committee. The recognition of the fragility of their power was another force that sustained their work together.

Research Question Three: Relationship between PCIG and Hierarchy

This question looked at the way the PCIG perceived its relationship to the hierarchy and examined the networks and open exchange of energy between the two. Interviewees from the PCIG were all members of the medical staff. As such, they had been trained through medical school, internship, and residency in the hierarchy of clinical decision making. This transferred to their general acceptance of a medical staff hierarchy, one with a division chief, a department chair, and a chief medical officer who reported to a chief executive officer. Interviewees' expectations were that at minimum the chief and chair would advocate for their interests, especially compensation, working conditions, and clinical resources to support their practices, to the Chief Medical Officer who in turn would bring their concerns to the Chief Executive Officer and others in executive

management. In reality, the PCIG did not experience this level of open exchange with its hierarchy. This will be described through their perspectives followed by those of their administrators.

PCIG Members' Perspectives

Relationship with Chief and Chair: Supportive but Ineffective

The relationship with the Chief of the Division of Ambulatory Care and the Chair of the Department of Medicine was described in guarded terms. When PCIG members talked about their efforts to achieve equity with the hospitalists, to resist the consultants' recommendation to increase caseloads, and later to organize the union, they described the chief and chair as supportive but ineffective. Dr. Jones indicated:

> Our division chief [Dr. Underwood, not interviewed for this study] was supportive, he understood there were problems, and he also felt frustrated in being able to deal with them. He had a real sense of fairness and it was really obvious that this [lack of equity] was really unfair.

Dr. Lewis spoke of both the division chief and department chair as being open to talking with the PCIG to help them understand where decisions were being made. She noted that:

> They were supportive but did not take an active role to advocate for the work of the primary care group

However, in what could be seen as covert support, the division chief met with the PCIG in its early stage of union organizing, when it was about to go to the Chief Medical Officer to present a counter proposal to the consultants' report on increasing caseloads. Dr. Jones recalled both the chief's candor and her reaction:

> Our division chief had a meeting and I think it was a Physicians' Interest Group meeting, where basically he came to us and said, "I can't get anywhere with administration and this is really important and I need you guys to say… you know to do what you did about the hospital coverage thing and say, look we just won't

> do it. You know, I need for you to say the primary care division won't do it, because they are not listening to me."
>
> And that helped me realize the position that our division chief was in, because you always think your division chief has this power to go and do things and then you realize I guess once you're division chief and you don't, and yet you have all these people that think you can do these things.

Relationship with the Chief Medical Officer: Conflicted

The relationship between the Chief Medical Officer, Dr. Majors, and the PCIG was the most complicated. Dr. Majors was the physician member of the system's executive management who also maintained a half-day clinic practice in primary care.

Interviewees from the PCIG were clear on the conundrum inherent in having a Chief Medical Officer who was also a primary care physician. Dr. Lewis summed it up clearly:

> The CMO was a bit of a contradiction. He is a primary care physician and still has clinic responsibilities. However, in his position in the system's administration he is supposed to look out for the organization as a whole, conveying the concerns of the medical staff but not serve as their advocate. He is the medical staff presence within the larger sphere of administrative and financial concerns and brings the interests of the physicians to the table, but acts more globally to serve the good of the system. We didn't always understand why he took a more political role with the primary care physicians, listening and empathizing but not acting on our concerns.

The perception of Dr. Majors' inaction, ineffectiveness, and at times avoidance of meeting with the PCIG representatives was echoed by Dr. Lyng who felt that:

> He worked very hard, but there's no communication between his staff and us. He speaks to the Board of Supervisors, so we felt that he did not do a good job as our representative, he did not get us involved in decision-making process. He didn't communicate with us what his decisions were and are or will be or whatever.

Dr. Jones spoke of Dr. Majors' untenable position and her personal sense that, "He's a good person trying to do his best in a difficult situation, like all of us." But she described the virulence of some of her primary care colleagues following an incident in

which Dr. Majors told the primary care physicians they would not be getting a cost of living salary increase:

> Some people thought, you know, he's the messenger and it puts him in a very bad position and other people felt like he'd totally forgotten his roots in primary care and totally betrayed us.

The poor communication between the CoP and Dr. Majors, the lack of involvement in administrative decision making, and perceived lack of an advocate for their concerns that resulted in frustration followed by union organizing was summarized by Dr. Jones:

> It was disrespectful and it's just not professional and not the kind of unpredictable, random work environment that you kind of want to hope you work in. So it seemed the only option in a county system, in this county system would be to form a collective bargaining unit.

Relationship with Administration: From Benign Neglect to Hostility

PCIG members frequently used the term "administration" to refer to the Chief Medical Officer, the Director of Ambulatory Services, the hospital administrator, and the chief executive officer for the health care system. Their perception of the relationship ranged from benign neglect to strong hostility. Dr. Jones's initial position was an example of the benign neglect. She noted:

> I hadn't had any bad experiences with administration except for the neglect, the sort of indifference, the disinterest, nobody had ever been you know, hostile to me in any way. They just never communicated. I thought, in general, administration was good people; I never had a fear of retaliation.

However she singled out the Director of Ambulatory Services, Mr. Walker, as having negative interactions with the PCIG, when she remarked:

> We had had sort of negative interactions with the ambulatory administrator. He basically had done things that had been problems and engaging in activities that had been problems for them.

Dr. Jones's language became more polarized when she talked about the post-unionization climate. Because there had been administrative opposition to the union, and the PCIG would be dealing with administrative staff on the refinement of the medical home model of care, she grew cautious and said:

> A fair amount of conflict has come up about whether we can trust the administration on medical home or whether it's just another ruse to get the… to have more patients in our panels. So again it's a lot of trust issues with administration and, yeah… because with the medical home you need resources to do that and they just don't trust administration to deliver on those resources.

Dr. Lyng was consistent in her comments about administration, especially about its lack of transparency. She cited two incidents in which primary care physicians were not consulted on decisions that directly affected their practices. The first was the use of her and her colleagues' names in promotional material for an insurance product that she felt misinformed their patients. The second was the preferential compensation granted hospital-based primary care physicians (hospitalists) that was not offered to clinic-based physicians. As she put it:

> The problem is that administration never been transparent before. They made a deal with the inpatient hospitalists, you know, and they never told us what they did with the inpatient managers group, the hospitalists. So we were kept in the dark and casually in our conversations we found out you guys are getting time off; we didn't get time off. On top of that, they only have inpatient duties, they didn't have clinic duties like we did and they get paid higher than we do and they get compensation with time off. … We feel like a lot of things happened behind closed doors, we were never involved in this decision-making process ever.

Dr. Alinsky was the most forceful regarding relations with administration. She stated emphatically:

> The administration had been telling us over and over again if you try to form this CBU terrible things will happen, terrible things will happen. You'll lose everything, you'll lose everything. You'll have to start from scratch, terrible things will happen. Don't do it. And this really had people scared.

> The administration would usually give us a little bit, give us a little bit, another carrot; sorry, sorry we didn't mean it [to treat us unfairly], very much like an abusive relationship. I mean we had enough energy to murder.

Administrators' Perspectives

Dr. Majors was aware of and very sensitive to his role as both a primary care physician and administrative leader of the medical staff. He characterized it by saying:

> I have meetings with my colleagues in primary care, but yet they're only one part of the system, so when I alluded to the other frustrations, we're in a big bureaucracy, you can only get to so many things.

He indicated that he was supportive of the work of the PCIG. However, he was clear on the degree to which he felt he could involve himself in it, especially as it moved into union organizing. He commented:

> I had to keep a distance in the relationship, because I respected what they were doing, and I felt that if I was part of the process, they would not be able to or they may not feel … they would feel inhibited.

He continued on the theme of respect as it factored into his decision making and his attempts to be considerate of individual ideas. In that vein he spoke of working for the interests of the whole organization, even if it was perceived as not meeting the needs of each individual:

> At times I have to make difficult decisions and I have to be on the other side and I know I alienate some of my colleagues, but at the same time I hope I do it in a respectful way, and listen to them, because that's what I try to do. I try to listen to what the issues are and that's where I'm not one to plop this down and say this is the way it's going to be. At times I've had to say that, but I've done it after listening to all the other options, trying to respect individuals, so no matter what, even if I disagree with the individual and I make a decision that's contrary, I can still look them in the eye and say I still respect you and out of the workplace here, we meet each other again, I hope you understand that. And it's not personal. It's a decision that we have to make on behalf of the institution.

When the PCIG's union organizing became a reality, Dr. Majors felt he had to take a position that would benefit the system as a whole. That meant that he would not

support his primary care colleagues, but rather support organizing activities for the entire medical staff. He admitted that he struggled with his decision, but came to terms with himself. In his words:

> I recognized that if they wanted to do it, that's fine, and I probably should step back and that the primary care group tried to organize individually as a primary care group separate from the recognition of the whole physician staff. And I was opposed to that because I felt that if the physicians wanted representation then all physicians should be represented, not a pocket here and a pocket there, and no one over there, so I was very against that. In fact it caused me internal dissension, I had to go against my colleagues, but I had to hold true to my beliefs that I said if you want to organize, you organize as a group [of the whole medical staff].

Dr. Middleton looked at the PCIG as the result of a lack of meaningful dialog between staff physicians and administrators. He pointed out that the energy that amassed and resulted in union organizing might have been diffused if there had been more consideration given to the PCIG's participation in decision making about their practices. He said:

> I think at times there should be more discussion and dialog before decisions are made, in terms of direction for programs and things like that. Not always but there have been issues over the years. I think a lot of this stuff you saw and probably heard about from primary care in terms of design of their days, their practices, their panels, all of those things were kind of decided and then presented, so I think a little more dialog back and forth would have been a smoother transition for a lot of those programs. I think that in a lot of ways… yeah, if there had been a little more discussion and dialog before definite directions were decided upon, it wouldn't have become as confrontational.

Mr. Walker was supportive of CoPs in general, but forthright in his opposition to the union organizing that the PCIG initiated. He went so far as to say that for himself and his fellow administrators:

> [We] tried to send out a message to discourage unionization. I think our overarching belief was that it was a mistake for the physicians to organize. We think that the actual forming of the union actually created a circumstance where there was going to be very specific work loads and job descriptions and things like that, that don't exist at this point in time in terms of criteria. So it's an

> opportunity then for the county, if you will, or the agency to be able to more, to much more identify a physician's role in terms of quantitative outcomes than it is currently.
>
> Our personal belief is that's a mistake. We think physicians are professionals, they shouldn't have quantitative outcomes embedded in their job descriptions, and we think that physicians, that you need to treat physicians differently than as if they're of another class or a union. So anyways we believed, this group believed, that this was a mistake.

Mr. Walker's words were not always consistent with those of the other administrators interviewed; however, he presented the opposition to the PCIG's union activities as representative of his and his colleagues' opinions, then qualified it by saying:

> We talked amongst ourselves and amongst the group to say that we thought this was not a good idea. Although we weren't uniform in that, in our group, we weren't uniform in terms of our belief around this. But that's just the nature of it.

Summary

PCIG members looked at their relation to the health care system hierarchy as an intricate network fostered by the continuous exchange of energy. The dynamic between the PCIG and its administrators changed as the PCIG evolved from a small group dealing with basic equity issues to a large body spearheading a major labor organizing effort. PCIG members described this exchange of energy as a facilitator of their work, one which started with alienation, described by Dr. Jones as "not having a seat at the table" where decisions were made. It changed to a more dynamic exchange as administrators reacted to the PCIG's union organizing activities. PCIG members learned, adapted, and traveled through phase transitions supported by this exchange of energy. At times they were frustrated by what appeared to them to be a lack of support from their administrators, and other times angered by the overt attempts, particularly by Mr. Walker,

to discourage their activities. At each juncture they solidified their internal network in order to pursue their objectives.

Research Question Four: Influence of Administrators' Backgrounds

Research question four delved into the backgrounds of the administrators and their prior experience with CoPs. The question further explored administrators' backgrounds in relation to the influence that might have had on their attitudes or behaviors toward the PCIG. From a complexity point of view, the question sought examples of nonlinear dynamics or sensitive dependence in relation to the formation and function of the PCIG.

This section presents only the administrators' perspectives. It is organized by interviewee followed by a summary of the points of agreement and disagreement among the three. PCIG members were not asked about their knowledge of administrators' backgrounds and therefore their perspectives are not included in the responses to this question. Each administrator was asked about his background and previous engagement with one or more CoPs. As the interviews progressed, each also talked about the health care system's culture and their own perspectives on the PCIG.

Dr. Majors

Throughout his 30-year career with the health care system, Dr. Majors attributed his growth from staff physician to managing physician to Chief Medical Officer in part to his ability to effectively share his ideas about both clinical and administrative practice. Dr. Majors described his management philosophy as collaborative and managing by example. He felt that his early clinic experience, in which he worked as part of a physician-nurse-administrator team, laid the groundwork for this approach. He noted:

> So my style is sitting down and discussing things with individuals, I'm not the most verbal individual; I try to show people and support individuals who will work with me and help them grow, so we can work as a team. Because my philosophy over the number of years that I've been here is that you can accomplish things by individuals who kind of show and lead by example, but you have people work with you, and with that will come success. If it's not coming out, then you kind of have to analyze it again, what do you really need to do to be able to provide whatever that service for the patients, for the division, for the department, for the institution, for your clients.

He also reflected on how this presents personal and professional challenges in his role as a member of the system's executive management. This was evident when he said:

> My role has been that of a physician who takes care of patients but I'm also doing it on a grander scale, I'm also wearing a couple of hats, because I also advocate and represent our physicians as the Chief Medical Officer. But I also represent the administration. How do we collaboratively work together to accomplish our goals here given fiscal and economical responsibilities and restraints and challenges that we have?

When asked about his views on CoPs, Dr. Majors seemed supportive when he remarked that:

> We're given the opportunity to go and do better. And those that show initiative, those that take the opportunity of trying to solve problems will be rewarded with more work [laughs], and also the recognition of knowing that you're doing something to help the community and the institution here. So with that comes identifying, there's an issue, there's a problem, how do we fix it? How do we get together with our colleagues and share that?

He recalled his personal engagement in a CoP through his clinic work in which he and the clinic administrator and nurse manager formed a collaborative for assuring communication among themselves and between themselves and their staffs. By his account, this resulted in ongoing operational improvements. He noted that this collaborative work gained recognition about ten years after it was initiated and was made the standard in all clinics.

When talking about the health system's culture, Dr. Majors spoke both retrospectively and prospectively. The CEO from about 1975 to 2005 used strong central control to run the organization. In Dr. Majors' words, "Our CEO at the time had a certain management style, he ran it and no one else did." Vestiges of his style still permeated the system. Looking forward, Dr. Majors talked of the current instability in the system, which started with the appointment of a new county executive. This was followed by the county executive's appointment of interim leadership for the system after the resignations of the CEO and key members of her management team. In addition, the county executive brought in a philosophy of "managing from the middle," a term that meant de-centralized authority for decision making. Dr. Majors commented:

> So going back to that culture, we're trying to change it so people recognize that they are important and they do make an impact and they can make decisions, as opposed to "oh, it's just the hospital director or the executive director or it's just the CMO making a decision, it's administration."
>
> I guess I'm getting back to helping transform that culture to show that staff are able to make decisions here and help assist us and we need to in order to be successful here, because when you have to just tell people to do things, it doesn't usually work out the best – up to a certain point. You want their input, you want their ideas and that's what we're trying to foster.

Dr. Majors was conflicted in his approach to the PCIG. As a practicing primary care physician, he wanted to advocate for improvement in compensation and working conditions for the clinic based physicians. As the chief medical officer and a member of executive management, he had to view the PCIG's activities in the context of the needs of the entire medical staff and the entire system. He expressed it thus:

> It's something that I've self-analyzed quite a bit over the last few years, because being a member of the primary care division, that's my home group, so to speak. I was in an environment here and I'm responsible for it, but yet to try and support as best we can with limited resources. And when you look at the individual

> primary care provider and their colleagues, they're saying how best can we fix this and by organizing, they saw that as an option that they took.

In the midst of this conflict, Dr. Majors found that, although he supported the PCIG's purpose in general and would do nothing to deter it, he needed to take a position regarding the unionization efforts of the PCIG:

> And I was opposed to that because I felt that if the physicians wanted representation, then all physicians should be represented, not a pocket here and a pocket there, and no one over there, and then the other people – so that I was very against, in fact it caused me internal dissension. I had to go against my colleagues, but I had to hold true to my beliefs that I said if you want to organize, you organize as a group [on behalf of the entire medical staff].

He also found it inappropriate to engage in any of the PCIG's activities related to unionization and was reluctant to continue his monthly meetings with its leaders. He knew that the PCIG would be bringing its proposal to administration and put his administrative role first, saying:

> I wasn't part of the process, intentionally … I didn't make any overt attempts to make it anything I wanted to know because I respected the process. I had to respect the process. So I never wanted to derail the process, I wanted to respect the process.

Dr. Middleton

Dr. Middleton talked about his medical career and administrative and teaching responsibilities as being very satisfying. His management philosophy was, "to appoint excellent people to positions of leadership and then let them do their job and help them in any way I can." He attributed his philosophy to the department chair he worked under as chief resident more than 30 years earlier. He put it this way:

> So I liked working for him and tried to emulate that. That's probably where most of that came from. Because I could see he had a very functional department, where people worked very hard and were committed to doing things. It had more to do with leading by example…

Dr. Middleton did not recall any CoP in which he participated with the exception of some early involvement with the CoP in this study. However, because it was composed of primary care physicians and he was a specialist, he attended in his capacity as department chair and advocate to the Chief Medical Officer and other administrators.

He frequently used terms that connoted structure and order. When discussing internal communication, he mentioned monthly department and division meetings and his weekly meetings with the Dr. Majors as the principle vehicles for raising issues and problem solving. He added that:

> Stuff really gets done through division chiefs or site directors, you know, or formal sub-committees or task forces and not this kind of grassroots kind of thing.

His comments also included his perspective on the health system's hierarchical decision-making process:

> Issues are brought forth and discussed and basically major important kinds of decisions are taken from the CMO further up the hierarchy for feedback before decisions trickle back down. I would say that more stuff comes from that end than our end in terms of the direction that the place is going in terms of just how it runs day to day and all of that activity.

He went on to say that his meetings with Dr. Majors were useful, that he listened to and discussed the concerns of the department, and that there was a satisfactory dialog. He qualified the openness of this dialog by saying that:

> The CMO [Dr.Majors] is receptive to open discussion unless there's decisions that have already been made that he's reacting to. You know, he listens.

When discussing communication issues, Dr. Middleton touched on the system's culture. Like Dr. Majors, Dr. Middleton mentioned the centralized character of the organization under a previous CEO. As Dr. Middleton put it:

> He really ran the place and had a handful of delegated chosen administrators who assisted in that process and that's been the culture here for many years and is a

> fairly steep hierarchy. All the people at that level of the organization, that's where the organization has been run and most major decisions have been made. Below that, starting with chairs, chiefs, physicians, it's a much flatter kind of organization.

With the advent of the new county executive and interim system leadership, Dr. Middleton recognized the attempts to promote a more open and decentralized decision-making process. He noted that these changes were very uncomfortable:

> It unsettles people until they know what is going to happen long term; a lot of people are pretty uneasy about what's going on. People feel threatened. I mean there's so much going now in the institution with all the changes in leadership, within the organization. You know, the time-honored way the place is run in terms of the CEO and all those other folks. All those people are gone except for the CMO basically, all have retired or gone part time or whatever. So there's been a total upheaval in the traditional org chart here so nobody really knows what will happen next [trails off]…

But he also noted that he believed that the ideas of the new team had potential for improving the organization:

> They are talking more about managing from the middle of the organization and things like that, that I think would be healthy. I'm not sure where the middle is. I asked them that, but I kind of think I know what they mean, empowering people, division chiefs, site directors, and people who are running programs to make decisions instead of having everything go up through a tightening funnel to the top. So I think that's what they are talking about too and that makes me feel good about what they are doing so far.

When talking specifically about the PCIG, he acknowledged his minimal role in its formation and functioning. He harkened back to the underlying reasons for the PCIG's formation, the members' desire to get together to petition for equity in compensation and hours and stand up to administrative directives to see more patients per day. He felt that, "in a lot of ways… yeah, if there had been a little more discussion and dialog before definite directions were decided upon, it wouldn't have become so confrontational." At the same time he reflected on his role, which he previously described as that of an

advocate for physicians to administration. When asked if he would have done anything differently to support the PCIG, he responded:

> No, I don't think so, I've thought about that in terms of could we have done stuff that would have… I don't think it would have, speaking loudly or more forcefully about things I think just would have broken down our credibility and communication chains with our leadership and it was really something that the group had to do for themselves, I think in the end. Yeah, yeah, I think it really had to translate that way because otherwise it was… It was much more clear who was speaking for who when they formed the group.

Mr. Walker

Mr. Walker's role was primarily to work with his own deputies and clinic managers to assure cost-effective delivery of care. He did not have direct authority over either the nursing or medical staff, but did control the overall budgets of the clinics (except physicians' salaries) and therefore had significant influence on their work.

Mr. Walker talked about his management philosophy initially from a strategic perspective, emphasizing the need to imbue a consistent philosophy throughout the organization. Going beyond the strategic, he also talked about his views on managing subordinates by giving them latitude and opportunity to try and sometimes fail at their work. He remarked:

> Well, my management philosophy has always been, first off, I always try to be very strategic. Managing people, my personal philosophy is to give my managers and my staff room to do their work. I would rather have a manager who is given the opportunity to make mistakes, and not be criticized, not for making them. It's only through actually making mistakes and managing that one learns and so what you need to do is get everybody the opportunity to roll up their sleeves and do the work that they need to do to learn how to manage, and to support that individual or those individuals.

However, he more narrowly defined opportunity as being not only within the strategic vision of the organization, but also within his own control. He conveyed this through the idea of a continuum ranging from mentoring to strong central control.

> At the same time, to provide, be a mentor and a leader to those individuals so that they have a sense of one, what the organizational direction is, and what the organizational philosophy is, which is sometimes a little bit different, and be very strategic to make sure that everybody got the mission, got what we are trying to accomplish, and got a sense of the commitment we have to our patients and our service.
>
> So stylistically I was never much a top down kind of guy, but on the other hand, there was, you know, sort of a little bit of benevolent dictatorship involved too.

When asked about his previous experience with CoPs, Mr. Walker was forthcoming with three examples. The first was an interdisciplinary group that he assembled to strategize about changing the primary care delivery model. He recalled:

> I became convinced that we needed to make a significant change in how we provide outpatient medicine, so [about four years ago] I invited a group of people to my home for an evening. I had some of the key physicians there, and I engaged some of our leaders in private care to come there. I actually said we want to change the way we provide care, we want to move towards the chronic care approach to patients. If we were to, as an organization, move to a whole new philosophy of care that we could turn things around in terms of both quality and cost ultimately; and we have a responsibility to move forward in that direction, if not a moral responsibility.

Their work moved from concept to strategies for implementation and needed to be accepted by more than just the informal group Mr. Walker had assembled. There was some resistance to adopting the new model from those responsible for implementing it based on its complexity and the inadequate resources being made available. At that turning point, Mr. Walker said:

> I think everybody kind of signed on, it was hard not to sign on, but at the same time, the implementation strategies were not always therefore agreed upon. I think [there was] personal frustration more than personal resistance. I don't think we found anybody intellectually disagreeing with what we were doing.

Another of Mr. Walker's CoP engagements was with a group formulating a means to assure health insurance coverage for all low-income children in the system's service area. Again he assembled an informal interdisciplinary group, which brought the

idea to fruition. The underlying purpose of the group was to reduce or eliminate barriers to implementation, which Mr. Walker expressed in the following way:

> And what we did is we guided the initiative through its early stages, through to this day. It still meets on a month-to-month basis, and we call ourselves the policy group. Well, in point of fact we just sort of self-proclaimed ourselves the policy committee. We made commitments to ourselves from the very get-go that we were about cutting through the process of making this thing happen. We were not about to sit around and get rule based, and therefore allow things to get in our way in terms of fulfilling the commitment of providing a health care product to kids.

His perception was that the group functioned with a great deal of equality among its members and that he functioned as its facilitator rather than as its leader. In his words:

> So anyway that was our group and that's how we formed, and we still are, we still get together, but there is nobody that … I mean, I'm sort of the chair, but everybody kind of participates equally.

Mr. Walker's third experience with a CoP was with the informal group of system administrators that met weekly to talk about "how can we further the issues of medicine in our organization?" He characterized the group as:

> It was not a formal group, it's not a committee per se, but it's a group of us that basically sat down and said okay what are the issues in front of us? What's going on? How do we get together and deal with them and so forth.

One of the topics that dominated the group's discussions was the primary care physicians' concerns, both before and after they formed their CoP. The administrative group recognized the importance of primary care to the system's strategic direction including assuring access to care for the uninsured and serving as the link between routine and specialty services. As Mr. Walker put it:

> And primary care medicine was a constant issue, always on the table; one of the issues we were always talking about is the care and feeding of primary care. …. How are we best able to work with our primary care staff?

Although he mentioned several experiences with CoPs that he deemed successful, Mr. Walker took an adversarial position toward the PCIG. Initially he talked about its work not as furthering the vision of the organization, but rather as a direct assault on it. He frequently used the term "we" rather than "I" to state that there was administrative opposition to the CoP, specifically its union organizing activities. However, in this comment, Mr. Walker implied that his position may have differed from that of his colleagues:

> We [the informal group of administrators] often talked about the primary care group, the fact that this union was beginning to form … So anyways we believed, this group believed, that this was a mistake. Although we weren't uniform in that, in our group, we weren't uniform in terms of our belief around this. But that's just the nature of it.

In a follow-up comment, he made his position clear that as an administrator he did not support the CoP's activity because of the impact it could have on him:

> At the time I thought oh, God, I don't want to be in a room negotiating with the doctors about their job description. I thought I can't think of a more horrific job description than that.

Mr. Walker did not address the subject of organizational culture directly, but recognized the changes that were destabilizing it, including his retirement as the director of ambulatory and managed care services. He mentioned the insecurity that both physicians and staff felt, but did not discuss the new county executive's philosophy on decentralized decision making. Instead, he commented on the PCIG's success in creating a union for the entire medical staff and softened his opposition to the union when put in the context of the major changes that occurred at the highest level of the system. He clarified that the change in position was made with the understanding, and relief, that he would not have to deal with it. His closing comment was:

> At the end of the day, however, it may be a good thing that the union was formed, from the point of view of the county, because I think they have an opportunity to organize the physician community more than they ever had before. Personally, it's something I want to stay as far from as I possibly can. In my new role, I will not be anywhere near it.

Summary

Each of the administrators was able to provide at least one example of his involvement with a CoP. The degree to which this affected attitudes and behaviors regarding the formation and functioning of the PCIG seemed to vary inversely with the amount of involvement each recounted. Because of this inverse relationship, the formation and function of the PCIG can be viewed as an example of nonlinear dynamics in that it evolved in form, function, and scope of work in ways that neither the members nor their administrators could have predicted. The PCIG evolved within a hierarchical environment in which the administrators had interactions with the CoP that were not consistent with their espoused beliefs about CoPs, and which likely influenced the evolution of the PCIG in a manner that neither the administrative nor the CoP's leaders anticipated.

Several events and messages from administrators that occurred along the PCIG's evolutionary path illustrate the principle of sensitive dependence and nonlinear dynamics. The first was the execution of Dr. Majors' philosophy that medical staff should be given the opportunity to "do better" in order to make a contribution to the community and the institution. His intent, which grew in part out of his previous experience with CoPs, was to recognize physicians who promote high-quality care within the limits of the medical staff and health care system's policies. The usual practice was to conduct clinical research, develop innovative clinical programs, or suggest cost-effective ways of

delivering care. When interpreted by the PCIG members, their actions fell outside the usual interpretation of “do better” but inspired them to coalesce around their interest in equity and recognition in decision making, an unintended consequence of Dr. Majors’ philosophy.

A second example was Dr. Middleton’s message to staff physicians that problems are solved and decisions are made through an orderly process. He observed that in spite of the health care system administrators’ desire to be inclusive in their deliberations, more decisions “come from that end than ours.” CoP members respected the orderly process, but found it ineffective for their needs and organized along lines outside the usual, both within their Division and between the primary care and specialty disciplines.

A third example was Mr. Walker’s espoused philosophy of being strategic, giving people room to do their work, and allowing them to make mistakes in order to learn. This philosophy was belied by later statements Mr. Walker made regarding his opposition to the union organizing activities of the PCIG and his personal preference for control. CoP members were aware of this contradiction and were directly impacted by the overt attempts to stifle their efforts. They chose to take an alternate path than that which Mr. Walker and some of his colleagues preferred, and they pursued goals they had not initially anticipated pursuing.

Ironically, Drs. Majors and Middleton, who were both very supportive of process, hierarchy, chain of command and accountability, had the least to say about personal experiences with CoPs, but were also the most supportive of the PCIG. In contrast, Mr. Walker, the administrator who talked extensively about his experiences with CoPs and his own successes with them was the least supportive of the PCIG.

Research Question Five: Organizational Adaptation

Question five delved into the extent to which the PCIG contributed to organizational adaptation or change. Organizational adaptation in this study meant making changes that would maintain viability and allow the health care system to continue its mission to serve its community. PCIG contributions were found to have made inroads in two areas: (a) changes in the internal environment, which were characterized by the PCIG as inequitable, and (b) organizational adaptation to a hostile external environment. This will be presented from both the PCIGs' and administrators' perspectives.

PCIG Members' Perspectives

Reducing Inequities

PCIG participants remarked on the impact the group had on reducing inequities in two areas: (a) between hospital- and clinic-based primary care physicians and (b) between the medical staff and both the health care system leadership and the county administration. These changes were viewed as strengthening the system's viability by improving the internal climate, which, as Dr. Jones said:

> It is true, I think, that patient satisfaction is linked to physician satisfaction and it is true that if the physicians are really unhappy it is going to affect the patient experience too.

The PCIG evolved out of its founders' belief that the inequities between hospital- and clinic-based primary care physicians in terms of compensation and working conditions needed to be eliminated. As Dr. Jones noted repeatedly, members felt that they did not "have a seat at the table" at which decisions were made about salaries,

compensatory time, or the size of their caseloads. Dr. Jones also spoke of the first change that the PCIG achieved and her reaction to it:

> So we sort of realized this was totally unfair and nobody's ever done anything about it and we're just stupid to keep doing this and it's kind of like we're idiots not to do something about this, and so what some of my colleagues did is they brought this forward, and they came up with a plan of what would be equitable and basically it went through and all of a sudden we were going to get comp time for doing weekends or we got a ward schedule that made a lot more sense or was a lot more equitable and then I think we were kind of like wow! What happened?

Dr. Lyng was equally surprised and pleased that the PCIG had influenced policies that brought clinic-based primary care physicians' working conditions in line with hospitalists. She commented:

> So we said you know on the short call day, we just could not have a clinic, it doesn't make sense. …So they gave in, the first time they gave us an extra hour on post-call day, right …make me negotiate for a post-call day off, it took like a lot of emails you know … we got "no" initially. "You're not allowed to do anything now, no, no, no." So now we got compensated for the holiday when we come in. Those are the achievements that we got. This is the last few years, yeah. This is because of the Primary Care Group that we got a lot of things done.

On a broader scale, PCIG members recognized their role in changing the dynamic between the entire medical staff and health care system administration. This took place first by reducing the philosophical differences on union organizing that existed between the primary care physicians and specialists, and then by becoming the driving force behind unionization that would become the vehicle for bringing the concerns of the entire medical staff to system administration.

The relationship between the primary care physicians and specialists had been acrimonious and characterized by deep resentment for the specialists, who were referred to as high earners with high power. The sentiment of the group was captured in Dr. Alinsky's words:

> There's 125 in the Department of Medicine, 75 are primary care physicians. So, it's always been the way it has been, that the people of power are the ones that are more vocal, have more money, and feel like they have greater power, and the primary care group has always been the poor masses.

This changed in the wake of the economic recession and departure of senior health care system management from which the specialists had garnered their power in the past. The PCIG's union organizing efforts on behalf of primary care proved valuable to the specialists when they felt threatened with reduced compensation or possible change in status from salaried and benefited employees to contractual providers. While the tension between specialists and primary care physicians did not disappear, it was reduced during the union organizing efforts led by the PCIG. Dr. Alinsky felt very strongly that this was progress toward achieving basic equity goals, even if it was not the ultimate leveling that she had advocated. Her thoughts were conflicted when she said:

> We will be able to all as a group, all 350 of us, protect what we have and that's just a big, big, big coup in itself and I can feel happy with that despite the fact that now it's this big thing and nothing's going to be able to be accomplished well and we'll just be a herd of cats, and it's going to be a terrible thing and there's going to be animosity and we'll never get anything accomplished except for the basics. And the basics is a big hurdle, so I'm of two minds, I mean I am pleased but we now have such a little say in this matter that we're going to be overwhelmed by the specialists.

But she went on to credit the PCIG's work in the formation of the physicians' union as having an overall benefit to the balance of power between the medical staff and both health care system leadership and county administration. Her feelings were expressed in the following quote:

> Under the CBU, negotiations will be between the CBU and the County Exec and Board of Supervisors, not the hospital. The hospital will continue to be the employer for day-to-day management, but is no longer in control of wages and benefits and must deal with the CBU for issues of working conditions. If proposals like 12-12 [the consultant' recommendation] are considered in the future, instead of being handed down as an edict from administration to the

> primary care physicians, administration will have to talk with the CBU and get their approval, negotiate an alternative approach, or drop the idea.

PCIG members also spoke of the change in their relationship with the Dr. Majors. Prior to the formation of the PCIG, Dr. Majors was characterized as being available to the group but ineffective in dealing with issues related to compensation and working conditions. Dr. Majors met regularly with the PCIG in the early phase of their formation, but stopped these meetings during the union organizing period. After the medical staff was granted union status, the monthly meetings were re-started. Each of the PCIG members commented on how their group had achieved a new balance of power with Dr. Majors, who they still viewed as their first line of communication with the health care system's administration.

Since the re-starting of the monthly meetings between the PCIG and Dr. Majors, Dr. Lyng commented that he had become more open, honest, and candid with them. She remarked:

> I think that the main reason is that he knows that he is going to deal with a very aggressive CBU. If he had dealt with just the primary care CBU, all he would have to deal with is just patient care issues. [We meet] every month, yeah. We talk about everything, all the concerns, he would listen. He started to listen more. And, he started to realize that… oh, I think what happened is their interests in the CBU. … I think he's much more respecting. He listens more. Amazingly. He did what we suggested.

Dr. Jones also commented on the cessation and re-starting of the monthly meetings and its significance:

> So those meetings [with Dr. Majors] have happened because of the effort to organize and they continue to happen and I continue to see value in them. Dr. Majors offered to meet with us monthly to hear our concerns. In fact I just got back from a meeting with him and it went over because there were a lot of concerns and I was in the position of starting on this medical home model and the position of saying to him, the administrator that we're dealing with I don't think she's hearing something really important and I want to bring it up to you because I don't think she's getting it and it's really important, and he listened. I don't

> know what he'll do with it because he doesn't really say, but just to … just to have that communication is totally extraordinary.
>
> These monthly meetings, which Dr. Majors canceled for a while but are now revived, and you know it's really nice to be heard and I think it gives Dr. Majors a bit of a different perspective on, you know…I hope it's more than just being heard. I hope it's a significant contribution, that somewhere along the line he's going to think back and say, when he's in some other meeting, he's going think back and say, "I'm hearing this from this person, maybe I'm going to have to do it." So it's a little bit of a seat…It's not exactly the seat at the table we were hoping for but …

Responding to the External Economic Environment

Dr. Lyng inherently understood the PCIG's power within the newly formed physicians' union and her own responsibility as the primary care representative on the union's formation steering committee as it approached the sensitive area of wage and benefit negotiations with a county experiencing a budget deficit. She used the term "noble" when talking about the PCIG's position on salary increases in light of the hostile economic conditions, and expressed concern when she said:

> So, I was talking to my group [the PCIG] and you know, I'm the representative for the department of medicine and I heard that all the specialists, high earners, are really pushing for salary renegotiation, this and that. I said, you know what? I just want to make sure that you guys know that I'm not going to go for that 'cause there's a budget cut right now. This is not the right time to talk about salary raise, we're going to look bad. So, I want to make sure you guys know that I don't want to push the salary raise; I don't want to talk about that.

Administrators' Perspectives

Changing Internal Dynamics

Administrators did not address the issues of reducing inequities directly, but spoke more globally about maintaining professional integrity and quality in the delivery of health care. Dr. Majors talked about the importance of differentiating medical professionalism from union organizing activities.

> As physicians we need to maintain our level of responsibility and accountability and professionalism when we care for our patients. And we are the ones that need to determine whether someone is doing something that should be done or needs to improve. I do not want a unionized environment that will derail that process because then it's getting away from that core, how do we better take care of the patient, so that's one of the other things I made sure the officers of the union that I wanted to see, that we maintain a medical staff structure for those issues for peer review and for patient care. Now, benefits, salaries, they're all part of the process that I respect and as the physicians go into negotiations and put all the documents together and work with the count, we'll go through the process.

Dr. Middleton acknowledged the importance of the PCIG in improving communication between primary care physicians and administrators first by mentioning the direct impact he believed had occurred:

> [The physician-administration relationship] is better but I think one of the things that I thought changed the dynamic was the formation of their [the Primary Care] interest group. The PIG group helped in terms of letting their opinions about things [be known] and presenting the divisions' concerns, that helped, and the unionization thing has changed the dynamic a little bit.

He also took a broader view and spoke optimistically of the softening of currently rigid lines of communication and reporting when he said:

> You know we traditionally have taken [recommendations] to the people we report to, so… I think what's going on now is very exciting. Hopefully we will be able to kind of re-shape things in terms of how the place functions and make it more efficient, be able to put people in different levels of the department, in my case to work on doing things.

Responding to the External Economic Environment

The administrators' perspectives on the impact of the PCIG on the health care system's adaptation to its external environment was framed by Dr. Majors' reflection on the need for health care system change given the economic turbulence that threatened the organization:

> As far as what we need to do to succeed is we need to change, use what's out there available to us to be able to succeed in a rapid way because that's what we've learned. We've tried it the older way and, you know we're able to make the

> little changes, but it's taken so long, so well let's try it like other people have done and let's make some rapid changes and see what we can do. Now with that, as you know, comes a lot of angst.
>
> It's certainly easy to look back and see how things could have changed and have been different. But given what happened in the environment here with our executive director leaving, the new county executive, other changes, you have to look at the milieu that you're in and so time was not an ally.

Mr. Walker looked at the external environment and its "vicious competition" for public funds as a key factor that prompted the PCIG's union organizing efforts. He limited his comments on the changing relationship between the medical staff and health care system leaders to the potential negative impact it would have on administrators and the positive impact it would have on the medical staff. On the first point he said:

> At the time I thought "Oh, God, I don't want to be in a room negotiating with the doctors about their job description." I thought, I can't think of a more horrific job description than that.

On the second point, he recognized the medical staff's point of view and found the opportunity for more effectively working within the health care system:

> And I think that at the end of the day, however, it may be a good thing that the union was formed from the point of view of the county, because I think they have an opportunity to organize the physician community more than they ever had before.

Finally, Dr. Middleton brought up the move to a more inclusive decision-making process as a result of the PCIG's activities:

> The hospital's had a long history of the hierarchical chain of command. If there had been a little more discussion and dialog before definite directions were decided upon, it wouldn't have become as you described, confrontational.
>
> I think one of the things that I thought changed the dynamic was the formation of their [primary care physicians] interest group. The interest group helped in terms of letting their opinions about things and presenting the divisions concerns, that helped, and the unionization thing has changed the dynamic a little bit. I think it's more of a dialog now.

Summary

Organizational adaptation occurred at two levels within the health care system. First, changes were made in the internal environment to reduce inequities within the Division of Primary Care and between primary care and specialty physicians on the medical staff. By changing internal conditions, PCIG members' value to the organization was validated and their commitment to supporting the organization was solidified. Recognition of the importance of the PCIG and positive responses to its concerns tied closely with Dr. Jones' belief that positive physician satisfaction can be directly related to positive patient satisfaction and clinical efficiency.

The second level of organizational adaptation was the relation between the health care system and its economic environment. By changing the relationship between medical staff and health care system leaders, which resulted in a stronger voice for medical staff in decision making, the organization potentially would have the opportunity to bring in ideas for retaining its medical staff and improving efficiency and effectiveness, qualities necessary to sustained organizational viability within the county administrative and economic environment. Actual results cannot be documented at this time.

Research Question Six: Fractal Analysis

Research question six asked to what extent the PCIG was a fractal of the culture or practices of the health care system in which it existed. The perspectives of the PCIG members and those of administrators were considered fractals of the health care system to which they belonged. When explored separately, each described a consistent picture of the whole, allowing the organization to be seen in its entirety from its fractals.

The responses to this question unfolded during each of the interviews as each participant was asked about his or her professional philosophy and personal perspectives on the formation and accomplishments of the PCIG.

Findings for this question were approached by examining the responses of both leadership and PCIG members. Administrators were asked about their management philosophy and leadership styles and whether they believed that their styles and values were reflected in their staffs' values and actions. PCIG members were asked about their alignment with administrators' management philosophy and style.

In the course of each interview, participants mentioned the organizational culture, mission and values, an excerpt of which was to "Provide high-quality, cost-effective medical care to all residents of [___] County regardless of their ability to pay." The mission statement was paired with a list of values, the most pertinent of which were as follows:

> One Team Working Together:
>
> - Management and staff are in partnership to fulfill the goals of the organization.
> - We demonstrate mutual respect, trust, and support.
> - Our communication is effective and reflects honesty, sensitivity and integrity.
> - We hold ourselves, individually and together, accountable for our actions and job performance.
> - We recognize, value, and acknowledge each other's unique contributions and accomplishments, and support each other as equals.
> - We give constructive feedback and encouragement.
> - We appreciate our diversity.

Both PCIG members and administrators brought up changes in system leadership and culture initiated by the new county executive at the time this study was being conducted. While these changes were not anticipated to affect the organization's mission, they were anticipated to change the highly centralized top-down decision-making culture

that had dominated the system for the previous three decades. This line of discussion addressed a different level of the study question than anticipated, as it related the influence of the larger entity, the county administration and governance, to the values and culture of the PCIG and the health care system.

CoP Members' Perspectives

Common Beliefs and Values within the Health Care System

As employees of a public system, all PCIG participants strongly associated their practices with the organization's mission and could find meaning in their work within that mission. PCIG participants consistently mentioned their personal alignment with the organization's mission and values. This was brought out in three areas: (a) commitment to service to all regardless of ability to pay, (b) positive future orientation, and (c) culture of change.

Commitment to Service. Among the PCIG participants, Dr. Alinsky was the first to be interviewed and the first to mention the mission and the altruism of the primary care physicians who worked in this public system. Her sentiments were:

> You know we're here for years and we really are the worker bees and we do love our place and we love our mission. We're here in a public hospital and we don't make money and we're not a doctor to makes money, otherwise we wouldn't be a primary care physician in a public hospital.

Dr. Lyng spoke about her previous experience with another health care system and her decision to become a staff physician with the study system. She spoke emotionally when she said:

> Ideally, I feel like I fit better in a place that I can serve the indigents, you know, the immigrants. I think I function better. I think I can be more comfortable. [Her previous system] is nice setting, I mean I still have good relationship with [them], I could go back. [This system] is more with a working class and I learned a lot at [my other system], but I think I did better here, and this is where I belong. I came

> here as an immigrants and I always want to do something. To me medicine is not a business; it's more like a … something that I want to do in my life.

Dr. Jones spoke specifically of the organization's mission and her alignment with it. At one point she mentioned that her family asked why she stayed with a public health care system when she could move to private practice, see a different clientele, and make more money. Her response:

> I have to ask myself why do I keep working here? And part of it is basically because of the mission. … there aren't a lot of doctors who want to care for underserved patients and so and I… that's my calling, that's my goal, that's my thing for whatever reason and so I want to keep doing that.
>
> The thing that keeps me coming to work, that remains meaningful after a long time, is I know that there is going to be some patient here who otherwise wouldn't get medical care. I know I am going to walk in and I am going to see some uncontrolled diabetic who just needs… you know, and I like doing that. I really like taking care of uncontrolled diabetics.

Positive Future Orientation. PCIG members frequently mentioned their commitment to the organization and to working toward a better future. Dr. Jones spoke of her personal commitment, which she put in the context of having opportunities to work with other health care systems but choosing to stay with the public system when she said:

> I mean I want to feel positive, I want to be optimistic and so in the face of chaos how do you stay optimistic? And. I guess this is my way to try to be part of making positive changes and hope that it's something great and you're… I think it's part of just aiming in the right direction, you can just get negative or you can just think it's going to be better tomorrow, where there's hope, or we're going to work this out.

Dr. Lyng reached into her Chinese origin and values to relate her commitment to achieving both its short- and long-term benefits from her PCIG work. In her words:

> I also think it's a mix of Confucius teaching and Buddhist teaching. I'm a mixture. I was trained and took part in conditioned thinking, since I was a kid, that you have to serve people… you don't just do it for yourself, you look at the interest of the group. And, you serve the group. And, you might lose something. Just like in a revolution, someone would die for a good cause. But then the

> Buddhist teaching taught me that I owe something, maybe in my previous life, to do something to pay back this group. This is the way I have to do. But, I also feel like I'm here long enough, it's my job to protect the younger physicians.

A Culture of Change. Dr. Jones spoke about the chaos that the changes at the top levels of the health care system had stirred, but cast it in a positive light for the PCIG and gave some perspective to the cascade of changes:

> …and then what happened was the big economic downturn so then resources got very scarce, the board of supervisors had to respond to that and they responded by doing some, for us, pretty drastic things like firing the Chief Executive Officer, nobody knows who's going to be next. New county executive who everybody's like, hmmm… he's a doctor and a lawyer, and the specialists started to feel like this guy came from [another California] County where he put all the specialists on contract and so all the specialists got really worried that they were just going to be put on contract and…out. And you know I had been here fifteen years and in my time that's the most dramatic thing from administration probably. It's a little bit better right now but the last few months have probably been the most worrisome time although paradoxically not so much for primary care and more for the specialties.
>
> I've heard language from some fairly mid-level administration about this; Just the idea that there is a real sense of urgency for change, which we need the change. It's one of the first things in creating change is to establish a sense of urgency. So there's definitely that.

Dr. Lyng looked at the changes from a practical point of view rather than a philosophical one, but her words captured a similar tone as Dr. Jones, that improvements would grow out of the avalanche of changes. Dr. Lyng cited an example of an initiative from the new county executive that gave her confidence in the future:

> The most important thing is that… the panel size is about… probably about 30-50 patients. They don't care how complicated the patients are, they don't look at anything and we've been fighting it for a long time. We say – you know, the panel size; 30-50 came from nowhere. There's a problem here. We have to re-look at that one, look at our data, our panel data, but then they never do. They never have a person to look at our data for the last 10 years. They didn't even look. But now, they're [the county executive and interim system executive] going to hire a full time person to do it. They acknowledged everything, we over-paneled. And so, they said… but, also, like I told you, the timing is here. Because now, they hired a consulting firm to look it up. Now, the consulting firm is actually looking at

> everything right now. So, now, they can actually look at our panel size right now. They can get us full-time people, actually a team for our panel size. So, it's the right timing. That he [the County executive] started to listen, plus just hiring a consulting company to come. So, it's the way the Chinese people say: You wait for the right timing and if it comes, it's going to happen. So now, they going to look at our panel size right now. They acknowledged everything,

Administrators' Perspectives

Common Beliefs and Values within the Health Care System

When administrators addressed questions about management philosophy and style, each talked about a personal approach, then elevated and put that approach in the context of the organization's mission and values. Administrators' responses about the commitment to the organization's mission and values were remarkably consistent with those of the CoP, and fell into the same three groupings: (a) commitment to service to all regardless of ability to pay, (b) positive future orientation, and (c) culture of change.

Commitment to Service. Dr. Majors referred to the health care system's mission when he spoke of the service philosophy and its strong connection to the medical staff mindset:

> I'm very proud of how we recruit our physicians here, and we retain our physicians, and we don't have a whole lot of turnover because the individuals that come here, physicians come here for the right reason. And the majority stay for the right reason, because you want to take care of patients who need the help… and also the recognition of knowing that you're doing something to help the community and the institution here.

Mr. Walker also recognized the importance of the service philosophy as the foundation of the health care system's mission when he said:

> We also have a service philosophy, that is we recognize that we have sort of a high calling here, and the high calling is to take care of the people that have no other source of care. People do have choices about their care. There's a lot of people that have no choice, and those folks need to be treated with respect and dignity and get the kind of service and access they need to care, and our job is to provide that and do it in a culturally competent, meaningful manner. So we saw

> our patients, and I still do, for 23 years I've seen our patients as the center of what we do.

Mr. Walker was confident that the mission of service to all was commonly understood and adopted in the daily practice of staff members. He talked about his management philosophy and challenged me to test his belief:

> My personal philosophy is to give my managers and my staff room to do their work. At the same time to provide, be a mentor and a leader to those individuals so that they have a sense of one, what the organizational direction is, and what the organizational philosophy is, which is sometimes a little bit different, and be very strategic to make sure that everybody got the mission, got what we are trying to accomplish, and got a sense of the commitment we have to our patients and our service.
>
> I think if you … when you go around to the organization and ask people about what's going on, you should hear us, whether depending on where you go, a similar organizational philosophy everywhere. If you don't, then we've got an organizational disconnect and that's bad.

Dr. Middleton spoke of the importance of the mission to executive leaders and how that influenced the deliberations between himself, his fellow chairs, Dr. Majors and his colleagues in executive management:

> Well, most of the chairs have similar interaction, weekly meetings with the chief medical officer where issues are brought forth and discussed and basically major important kinds of decisions are taken from the CMO further up the hierarchy for feedback before decisions trickle back down…the chairs and chiefs of the divisions … share in a lot of those decisions…well, yeah as long it aligns with what the county's mission is and where they're [executive management] going with their own kind of ideas about what's going on.

Dr. Middleton also addressed the perpetuation of the commitment to the mission from his position to his chiefs of services by saying:

> I think you also pick people who are going to do things in a similar way. But most of them I would say have the same kind of approach to things. I'm not sure they emulate my style but, maybe they… I appointed a lot of them because I see they could do it in a way that I was comfortable with.

Positive Future Orientation. Dr. Majors was very involved with a strategic planning effort for the health care system, which was developing strategies to sustain the organization through difficult economic conditions and adapt to near term environment changes. He addressed both the need for the planning process and his optimism for the future:

> If you don't get through this without massive cuts, you will not be here to deliver when we get there. And when we see the emails about the State, or you know the State's in disarray and we may be having IOUs in the next weeks, and that means we're not going to get paid, and what happens to our programs, how do we make it to the finish line. We see the light, but it's still a little glimmer out there and how do we make it there, so that's the apprehension that I have. So I'm excited, but yet apprehensive
>
> It's in those change processes and principles that we're all going to do it. Because you know we will stumble, and as you …if you don't make mistakes you do not try hard enough. So we will stumble, we will fall, we will…our chins will hit the ground once in a while, but you just have to get up though and keep on making some changes, in order to achieve that. So yes, as far as what we need to do to succeed is we need to change, use what's out there available to us to be able to succeed in a rapid way because that's what we've learned.

Mr. Walker did not share Dr. Major's optimism about the future because of the multiplicity of factors confounding the health care environment. However, he recognized the unwavering support of the Board of Supervisors in their role of having ultimate responsibility for decisions regarding the future of the health care system. He noted:

> But nonetheless, I think this whole notion of political support has been pretty constant, the change has been so much not in the underpinning philosophy, it's in how some of the…how to execute. But the point is this is a changing of, I don't think philosophy, but it's driven by, I think a degree of panic, I think of panic about the future. Meanwhile, you overlay that with health reform and it gets really confusing. And so I don't know how an elected official who is looking at the complexity of health reform looks at this very tight community, and tries to figure out how they're going to make this place survive into this next decade is going to be, how do you do that? It's really extraordinarily challenging, and for all of us, you know and if health care was hard in the 80s, and if health care was hard in the 90s and now it's unbelievably hard, it's just unbelievably hard in order to be able to sustain and move to a new future.

Culture of Change. Mr. Walker recognized that the support for the health care system's culture rested with the county Board of Supervisors who had ultimate control over the allocation of financial resources and also held the administrative leader of each operating department accountable for the use of those resources. Mr. Walker reflected on this first by saying:

> We're a public institution and it's interesting we need to interpret strategy within our Board of Supervisors and approved, we have our strategic vision which was approved there, our business plan was approved there, so unlike a private organization whose strategies are often, you know, not public, ours are extraordinarily public. I think the fundamental commitment to it has been consistent, I mean if you go back into the 80s and 90s and the … and you know literally I've been here some of the 80s, some of the 90s now, so three decades almost, I've been part of each decade. There's no question there's a different political philosophy of some of our elected officials, however, I think the over-arching commitment to this institution and keeping it here for our community has been strong with all of those decades.

Mr. Walker continued his reflection on the changing position of the Board of Supervisors and how he believed their position would impact the health care system's behavior, though not its values and culture:

> I think this whole notion of political support has been pretty constant, the change has been not so much in the underpinning philosophy, it's in how some of the – how to execute… And they're [the Board of Supervisors] really worried, they look downstream, they say what are we going to do, how are we going to sustain this place, and the only way to sustain it is to make it more and more and more and more efficient, and maybe that we have to begin to think about changing our service delivery in a way that is going to allow us to stay in operation.

Dr. Majors had the closest relationship to the new county executive and the greatest depth of knowledge on the executive's initiatives and motivations. He summarized his views this way:

> We've been very uni-directional from our hierarchy going down. And we recognize that we needed a lot more of our middle management and a lot more of our staff to do it another way. So we've been trying to change that culture. … so

> people recognize that they are important and they do make an impact and they can make decisions, as opposed to oh, it's just the hospital director or the executive director or it's just the CMO making a decision. Or it's administration, why do they do that, they don't listen to us, if they would have known and heard us. Well we want to get away from that, because up to a few years ago and that's just the way that style was because of our CEO at the time.

Dr. Middleton also commented on the powerful influence the previous system executive had on the organizational culture and how that was starting to change. From his perspective:

> I think that the culture here dates back to the previous CEO who really ran the place and had a handful of delegated chosen administrators who assisted in that process and that's been the culture here for many years and is a fairly steep hierarchy. Things flatten out pretty quickly once you get below the top half a dozen administrators.
>
> Well, I think with our new consultants [brought in by the new county executive] that are here they are talking more about managing from the middle of the organization and things like that, I think would be healthy. I'm not sure where the middle is. I asked them that, but I kind of think I know what they mean, empowering people, division chiefs, site directors, and people who are running programs to make decisions instead of having everything go up through a tightening funnel to the top. So I think that's what they are talking about too and that makes me feel good about what they are doing so far. It's [the steep hierarchy] really kind of hand-cuffed everybody for a long time.

Summary

The findings related to fractality were based on two views of the organization incorporated into the research questions: (a) administrators' reflections on their management philosophies and the degree to which each believed his philosophy was followed by subordinates and (b) the perceptions of the PCIG members that their beliefs and values were similar to those of their administrators. When analyzed from both points of view, a high degree of consistency was revealed. This consistency led to a clear picture of the whole organization as seen through its fractals. Consistency was most apparent in three areas: (a) commitment to service to the community, (b) a positive future orientation,

and (c) a culture of change. PCIG members all spoke of their commitment to working in a public system where they earned less than in private practice, but knew that they were caring for people who could not get care elsewhere. Commitment to service was mentioned by administrators as part of the health care system's mission and values. Leaders modeled this through their philosophy of leading by example. Physician leaders spent time with staff physicians in clinics and hospital wards, while Mr. Walker worked behind the scenes to design systems that would support improved access and higher quality patient care.

The positive future orientation of the PCIG members was illustrated in the belief that their ongoing work was improving not only their working conditions but also those of medical residents and other physicians who would be working with the system in the future. The positive orientation of administrators was grounded in the belief that the system as a whole would be able to sustain its mission through the supportive decisions and actions of county leaders and its governing body.

Finally the culture of change was expressed by PCIG members as integral to their actions on behalf of the medical staff, while the culture as viewed by the administrators was a systemic approach to decision making that encouraged integration of ideas across levels of the hierarchy and gave more influence to staff physicians and middle managers.

When viewed from a complexity perspective, the PCIG and administrators exhibited characteristics that were self-similar, demonstrating that each was fractal of the same health care system.

CHAPTER V: DISCUSSION, IMPLICATIONS AND RECOMMENDATIONS

This chapter includes five sections: (a) summary of findings, (b) discussion of findings in relation to the literature, (c) implications for leaders in general, health care leaders, and leader training, (d) recommendations for future research, and (e) final thoughts.

Summary of Findings

The PCIG formed as a self-organizing group that became a community of practice (CoP) within a traditional hierarchical organization. Its formation was prompted by a need among primary care physicians to improve working conditions and achieve equity in compensation with those doing similar work. The CoP coalesced around three attractors: (a) perceived injustices, (b) powerlessness, and (c) ineffective communication within the medical staff and between primary care physicians and the administrative leaders of their hierarchy. The PCIG met the definition of a CoP because its formation was not directed by any outside authority and it was brought together by an affinity for addressing a common set of interests and needs. It started as a group of four physician organizers who were able to transfer the energy generated from their affiliation to their colleagues to facilitate growth and evolution of the group and to their administrators to facilitate an exchange of ideas not experienced prior to the PCIG's existence.

The group evolved through a series of phase transitions that fundamentally changed its being. Each phase transition was marked by a fitness peak or equilibrium with its environment and subsequent phase transition and journey through disequilibrium. The phase transitions brought the PCIG from a small group secretly meeting behind closed doors to one that grew in concert with changes in its environment to very publicly

engage an entire medical staff in forming a labor union. While the PCIG was experiencing phase transitions within its environment, it was also having an influence on that environment. Its growth, adaptation, and emergence had an influence on the way its administrators viewed the PCIG, the entire medical staff and strategies for managing the health system in the larger context of the county's administration and governance.

Sensitive dependence was demonstrated through the messages sent by administrators to the PCIG and the unanticipated and unpredictable actions that took place over the five- to six-year history of the group. Each of the administrators spoke of his management philosophy in terms of willingness to have staff take advantage of opportunities to grow by participating in projects, research, or developing processes that would benefit the health care system. Each also recounted experiences with CoPs and the contribution those experiences had on their management philosophies. Drs. Majors and Middleton recalled only one significant experience each, yet both were very supportive of innovation and the introduction of novel ideas, as long as those activities were within the health care system's and medical staff's established processes, policies, and procedures. They supported the right of the PCIG to form and evolve, but were not expecting the magnitude of change that grew out of the group's work. They speculated that the changes precipitated by the PCIG would fundamentally alter the business relationship between the medical staff and health care system leaders in ways consistent with the organization's value of leaders working in partnership with staff to fulfill the goals of the organization.

In contrast, Mr. Walker mentioned three CoPs in which he had participated and could clearly articulate the changes that had occurred as a result of the work of those groups. In contrast to the other administrators, Mr. Walker was mildly supportive of the

PCIG and staunchly opposed to the changes precipitated by it. Mr. Walker's actions seemed to energize the PCIG to work more closely together in pursuit of its goals.

The PCIG's contribution to the adaptation of the health care system to its environment occurred at two levels. First it improved the communication and solidarity within the Division of Primary Care and between primary care physicians and their specialist colleagues. This was a significant step in achieving recognition of the voice of the PCIG, solidifying its commitment to its work with the health care system and to striving for ongoing organizational improvement. That solidarity led to the second aspect of organizational adaptation: the change in the relationship between the health care system and its external economic and administrative environment. By achieving a stronger voice in decision making, the PCIG and its administrators had the potential to move together toward improved physician retention and improved efficiency and effectiveness, qualities needed to sustain a health care organization in a hostile economic and demanding administrative environment.

Fractality, or the ability to see a whole through the self-similarity of its components, was clearly demonstrated. As each interviewee presented a personal view of his or her values, it became clear that there was a consistent message being related and a strong alignment with the health care systems' mission and values. Consistency was most apparent in three areas: (a) commitment to service to the community, (b) a positive future orientation, and (c) a culture of change. Interviewees' explanations were heartfelt and emphatic as each laid out his or her views individually. When brought together it was clear that a whole system was being described repeatedly in the fractal narratives of both PCIG members and administrators.

Discussion

The discussion of findings is organized in five areas: (a) complexity science and business organization adaptation, (b) communities of practice as agents of change, (c) measuring the benefits and value of communities of practice, (d) conditions that foster or inhibit communities of practice, and (e) hierarchy as a facilitator or inhibitor of change. This follows the organization of the literature review and relates the findings to the literature and the theoretical framework on which this study was built.

Complexity Science and Business Organization Adaptation

Findings in this study illustrated a health care system and a community of practice, the PCIG, as complex adaptive entities. As such, and consistent with Maturana and Varela's (1987) concept of autopoiesis, both were able to change in concert within their environment and simultaneously change the environment in which they existed. This phenomenon was studied in many types of organizations with varying results. Those that most closely approximated the situation in this study were conducted by Forbes-Thompson, Leicker and Bleich, (2007), Houchin and MacLean (2005), Mitleton-Kelly (2006), Stackman, Henderson, and Bloch (2006), and Wollin and Perry (2004).

Similar to the three groups studied by Stackman et al. (2006), the PCIG formed in a nonlinear manner, making the existence and evolution of each of these group minimally predictable. The PCIG formed without direction from its administrators and coalesced around attractors that remained constant throughout its existence. The attractors of perceived injustices, powerlessness and ineffective communication, did not vary over time, even as the relationship between the PCIG members, their specialist colleagues and their administrators went through unanticipated changes. The changing relationship

between the PCIG and its administrators which the PCIG members characterized as a positive step in reducing perceived hostility and miscommunication, were simultaneously linked to union organizing activities that set up a clear delineation between the entire medical staff and health care system administrators. The PCIG fell clearly on the side of the organizing activities which demonstrated both evolution and adaptation, and its ability to re-create its being, consistent with the concept of autopoiesis, while maintaining its engagement anchored to attractors.

Another example of business organization adaptation relevant to this study was Mitleton-Kelly's (2006) work that demonstrated that a division of a quasi-public organization adopting non-traditional ways of managing change through the use of CoPs and less hierarchical control could outperform similar divisions that maintained traditional management approaches on the critical measure of cost effectiveness. This approach was also found to be effective in the high-performing nursing homes studied by Forbes-Thompson et al. (2007) that supported internal connectivity, horizontal and vertical information flow, and the introduction of innovative ideas. A variation on this approach, as studied by Wollin and Perry (2004), looked at the rebalancing of fundamental rules, or guiding principles, which could also be interpreted as attractors, at Honda Motor Company of Japan in order to regain a competitive position in the auto industry. By introducing customer service to the long-held principle of excellence in engineering, Honda successfully adapted to its environment.

In contrast to the findings in this study, Houchin and MacLean (2005) chronicled the events of an organization attempting to leverage interdependencies and open exchange. When challenged by a period of disequilibrium, the organization emerged in a

traditional hierarchical form of decision-making largely attributed by the authors to a need to quell anxiety at all levels. However, it was an administrative decision to return to the strict hierarchy for decision-making, not one shared between administrators and managers or line staff. Although the hierarchy in this study remained intact at the end of the study, the CoP made irreversible changes in the dynamic between administrators and members of the medical staff that added the voice of the "worker bees" to administrative decision-making.

During the course of this study, the PCIG emerged as a self-organizing group and a CoP that had a profound impact on the health care organization in which it existed. It not only facilitated and expedited communication within the Division of Primary Care and between primary care physicians and their specialty colleagues, it also was a driving force in changing the dynamic between the entire medical staff and the administrative hierarchy. It brought long-standing issues of inequity to the forefront, engaged in organizing activities that culminated in the unionization of the entire medical staff and created a climate in which the employed medical staff felt it had a seat at the decision-making table with the health care system's administrators. Those factors characterized an adaptive organization, one which could achieve a collaborative relationship between administration and its medical staff to be in a stronger position to deal with a turbulent external economic and political climate. At the close of this study the health care system remained a hierarchical organization but was engaging in medical staff participation in decision making with a view toward capturing the exchange of energy in adapting to its environment and assuring its sustainability.

Communities of Practice as Agents of Change

The PCIG became a symbol of change in its organization. This is closely comparable to the findings of Paulus, Davis, and Steele (2008) in which a health care system used a hybrid CoP of volunteers and assigned participants to design high-quality and high-value care models. Those hybrid CoPs were recognized for their contributions to innovation and development of well-received models of care. However, they differd from the PCIG in that, as hybrid groups, they were carrying out an idea originally generated by their administrators. Wenger (1996, 1998, 2000) identified many forms of CoPs and refuted the idea that they must be of a certain size or composition, thereby acknowledging this type of variation.

As a CoP more closely tied to Wenger's foundational definition, the PCIG was totally self-selecting, self-organizing, and self-governing. Its formation was generated from energy internal to the group and given tacit support from its administrators. Plowman et al. (2007) studied a group similar in its self-organization but composed of youth who became the agents of change for a faith-based organization experiencing diversification of its congregants. The group was responsible for the emergence of the faith-based organization; however, members credited the role of leadership for creating conditions that supported its work. In many ways, the PCIG also acknowledged the background support of its administrators for allowing the efforts to proceed, even though the PCIG was challenging the status quo of traditional relationships and hierarchical decision making.

The PCIG's experiences with internal dissension and conflicts with their specialist colleagues could also be found in the work of Pemberton, Mavin, and Stalker (2007).

These authors recognized the benefits of CoPs, but cautioned on the negative aspects. They found that CoPs as agents of change faced issues with their lack of transparency, internal and external power struggles, and difficulty in achieving a balance between guidance and authority within the group, all characteristics evident in the findings regarding the PCIG.

The significance of the PCIG as a symbol of change was exemplified by its internal evolution and external adaptation, similar to Stackman et al.'s (2006) findings regarding ability of CoPs to redefine notions of success, leadership, and control in ways that fostered knowledge generation around shared goals. If the PCIG had not used the energy of open exchange with its environment, continuously evolved and communicated its markers of success, and changed the balance of power with its administrators, it likely would have become a dissipative entity.

The longevity of CoPs is highly variable and often depends on whether one was created to solve a unique problem (Juriado and Gustafsson, 2007) or was intended as a more general body engaged in continuous growth and development of a practice (Forbes-Thompson, Leiker, and Bleich, 2007). The PCIG not only endured for more than five years, but maintained its status as an agent of change. It did so through a bifurcation into a formal entity that was aligned with the medical staff union and recognized by the health care system's leaders as having a role in policy deliberations, and at the same time maintained an informal entity that continued to engage in professional development, practice improvement and resource allocation to assure staffing, equipment and infrastructure were adequate to meet patient care needs.

Measuring the Benefits and Value of Communities of Practice

Findings indicated that the PCIG identified benefits of its CoP in very personal terms. These occurred on two levels: individual achievement and growth and group achievement. Individual achievements included the opportunity for Dr. Alinsky to exercise her considerable organizing and advocacy talents and Dr. Lyng's realization of her Buddhist tradition of humble service. In exercising her personal mission of service, Dr. Lyng further found her voice as an advocate and leader within the PCIG and later in the union. Both of these are examples of sensitive dependence, the unfolding of events in unplanned and unpredictable ways, emerging from a set of events seen in retrospect as the precipitating factors.

Administrators, looking at the PCIG as outsiders, described its contribution in terms of organizational improvements to the dynamic between medical staff and administrators, demonstrating an open exchange of energy that would not have occurred if the PCIG had not existed. Results reported by Millen, Fontaine, and Muller (2002) were similar. They found direct benefits to CoP members in terms of personal and professional development and community building to solidify trust. They also identified organizational benefits of improved communication and idea generation. Leaders in the Millen et al. study identified improved efficiencies and product innovations, topics that were not addressed by, or were the goals of, health care system participants.

The PCIG members identified specific benefits attributable to the group's work. These included decreasing inequities in compensation and working conditions for all primary care physicians and, ultimately, a seat at the table with health system leaders making critical decisions about their practices. Just as the PCIG did not have a specific

trajectory or duration for its work when it was formed, Juriado and Gustafsson (2007) looked at a CoP that formed to overcome the obstacles inherent in the execution of a multi-organization media event. The success of that CoP was based on trust built within the group, expertise shared among members, and tacit knowledge developed through a collective memory. And just as the PCIG sustained its efforts for five or six years, the CoP in Juriado and Gustafsson's study sustained its efforts for several years for similar reasons.

Archibald and McDermott (2008) added a quantitative element to the measurement of CoP success. Their finding that the strongest predictor of a high-performance CoP was the level of funding provided for face-to-face meetings was not consistent with the factors contributing to the sustainability of, or success achieved by, the PCIG. The PCIG operated with no direct organizational funding. The only contribution the health care system made was to allow physicians to use a portion of their administrative time to hold official meetings. While not a trivial contribution, the use of administrative time was reported by PCIG members as a small percentage of the actual time they devoted to the group's work. Most face-to-face time was during non-work hours.

Of greater importance was the personal transformation of CoP members from passive accepters of the status quo to active advocates for organizational change. Each recounted a story of personal contribution to the CoP that was not only an attractor to sustain the momentum of the group as it engaged in more vocal and aggressive tactics, but also to maintain intense personal engagement of the PCIG leaders interviewed in this study. This example of strong participation in a network that was invaluable and

incalculable to members was also the source of energy that sustained the group through its phase transitions and fitness peaks.

Conditions That Foster or Inhibit Communities of Practice

The conditions that fostered the PCIG were internally driven by its founders, but the group thrived under conditions best expressed through the self-similarity of the PCIG and its administrators. The attractors of reducing inequity, overcoming powerlessness, and improving communication that sustained the group's cohesiveness were shared values of the whole organization. The self-similarity of CoP members and administrators, expressed through their fractal narratives, was the subject of Levick, Woog, and Knox's (2007) work. Although they did not address CoPs specifically, these authors found that fractality contributed to the "creative well-being of the group" (p. 261), which may be extrapolated to both leader-directed and self-organized groups. They further posited that fractality has the potential to reduce the rigidity of hierarchical organizations. The alignment of values, demonstrated through the fractality of both PCIG and administrators to the whole organization, reduced but did not completely remove administrator resistance to PCIG activities.

The PCIG was an example of a CoP that persisted in spite of a lack of overt administrative support. It shared a philosophical alignment with its administrators as each echoed the organizational mission of service to the community, but differed in its interpretation and method of carrying out that mission. The PCIG, seeing itself as the front line of service and needing administrative support to do its work well, sought to break through the rigidity of the hierarchy while the administrators held tightly to the power vested in their roles. This is consistent with Brodbeck's (2002) conclusions that

senior managers in his study gave general support for the concept of CoPs, but felt it necessary to limit their authority and make them a part of the organizational structure. Yanow (2002) identified managerial defensive behavior, entrenchment in the established hierarchy, and fear of showing ignorance as factors that inhibit the work of CoPs. The PCIG experienced resistance from administrators based on its work outside the health care system's hierarchy, but administrators' interviews did not reveak them to be either defensive when discussing their actions or have any fear of showing ignorance. It appeared to be their adherence to the fidelity of the hierarchy that drove their resistance. The most vocal detractor among the administrators was Mr. Walker, Director of Ambulatory Services. His disdain for the work of the PCIG was contradictory to his personal experiences with CoPs. However, the CoPs in which he participated were, in his recount, groups in which he could take a lead role in designing health system change with a group of his peers, while maintaining his status as a senior administrator and decision-maker. This is consistent with Brown and Duiguid's (2001) observation that CoPs were more cohesive if constituted with members who perceived they shared a common practice, and eschewed the idea of boundary spanning.

A condition that may be either a facilitator or inhibitor of CoPs is that of time. Both Roberts (2006) and Kerno (2008) identified the importance of time in relation to building discourse, trust, and effecting change. Time played a secondary role in the emergence of the PCIG in that the group evolved over a five- to six-year period, which fostered trust and discourse, but it was also pressured by external events to respond and adapt, thereby compromising the time advantage in some of its thought and strategy development. Little research has been conducted on the actual lifespan of CoPs. They are

by definition self-organizing and participants in a series of events entwined with preceding ones through the phenomenon of sensitive dependence. This makes their ability to endure minimally predictable and highly subject to events in both their internal and external environments that influence their longevity.

Hierarchy as a Facilitator or Inhibitor of Change

Findings in this study indicated that a community of practice can organize and be effective in a hierarchical organization. Most literature did not support this finding. Psoinos and Smithson (2002) indicated that hierarchy is a common constraint on achieving empowerment between layers of an organization and may be associated with the reluctance of managers to relinquish power. Shoham and Haskall (2005) pointed out that adherence to hierarchical decision making and cumbersome approval processes inhibited organizations from leveraging knowledge or creating a highly dynamic internal environment. Kerno (2008) also concluded that hierarchy may impede the free flow of information across an organization and delay or prevent the integration of the work of communities of practice.

Brown and Duiguid (2001) explained the phenomenon of hierarchical resistance to CoPs in part as being associated with the qualities that influence the effectiveness of information exchange. They theorized that information was more effectively exchanged within rather than between CoPs due to the commonality of interest in and relevance of that information. It was clear that the PCIG was formed to further the interests of primary care physicians, which at times conflicted with the interests but not the values of the health care system. Administrators who were interviewed in this study, while not defined in this study as a CoP, believed they needed to take the interest of the whole organization

into consideration with each of their decisions. While there was a confluence of values between the PCIG and administrators, there was a divergence on how they should be applied in achieving organizational and medical staff goals.

Brazier (2005) added uance to the argument that hierarchy inhibits and stifles creativity and innovation. Her perspective was that it is not possible to definitively say whether organizational climate causes innovation or whether being innovative leads organizations to become more flexible. It would appear from the success of the PCIG to organize within a hierarchical organization, and successfully develop and pursue its novel ideas that the dedicated pursuit of innovation may indeed lead to an organization becoming more flexible.

Finally, Nelson (2001) identified patterns of face-to-face communication that followed both hierarchical and peripheral lines and provided conduits for exchange of novel views, tacit knowledge, and, ultimately, avenues to recognition within a hierarchy. The PCIG maintained its connection to the hierarchy but developed a rich face-to-face dialog within its group and between its group and its colleagues in the medical specialties to have its novel ideas fully recognized and adopted.

Implications

Implications for Leaders

At the time this study took place, the organization and management of the delivery of health care services throughout the United States was being influenced by an external environment experiencing an economic recession, federal legislation mandating expanded access to health care services by previously marginalized groups, and new federal and state regulations requiring changes in reimbursement for care. These

conditions likely had an impact on the decision-making processes and ultimately the decisions made by each and every health care organization's leaders to guide their path to sustainability. The degree to which leaders of these organizations may adhere to a strict hierarchical decision-making approach could influence the ultimate achievement of adaptation of the internal environment and a reciprocal influence on changing the external environment.

While the specific events that took place in this study may be applicable only to organizations that employ physicians, not to those with open medical staffs, more general lessons were also evident. The power of the PCIG to influence administrators, to penetrate the hierarchy in novel and innovative ways and to support the change and adaptation of the organization to its environment may be applicable to any health care organization.

This study demonstrated that the administrators of a health care organization, facing turbulent external and internal environments and characterized by an adherence to hierarchical decision authority, can adapt to what appeared to be environmental assaults by taking advantage of the power of a community of practice to generate alternatives to "business as usual." The coalescence of the PCIG, which demonstrated self-organization, and its persistence based on the presence of attractors, resulted in the achievement of not only a series of phase transitions for the PCIG, but also a sea change for the health care organization in this study. That change, which prompted the health care system leaders to reach a new way of relating to their medical staff, also strengthened the organization's position within its environment, through the adoption of a more united and integrated relationship between administrators and medical staff. This in turn positioned the health

care organization's leaders to work more effectively with the county superstructure and the hostile economic environment by collectively achieving stability in the workforce, collective agreements on priorities and related administrative and clinical changes needed to pursue those priorities.

The literature demonstrated that the acceptance by leaders of ideas from communities of practice is not a routine practice in organizations with strong hierarchies. It appears to be antithetical to the principles of hierarchy. Yet, as this study demonstrated, CoPs can bring both welcome and unwelcome ideas forth that can destabilize an organization, move it away from equilibrium, and either force or collaboratively support the adaptation of an organization to its environment.

Leaders of any organization can begin to "see the usual and unusual" when viewing their domains through a complexity lens, looking for the attractors that engage and perpetuate individual and group actions, looking for the small events that precipitate major changes through the concept of sensitive dependence, and looking at exchanges of energy within and between environments as knowledge building efforts that facilitate adaptation.

Implications for Education of Leaders

It would be valuable for leaders to be routinely exposed to the principles of complexity theory in relation to organizations in their education programs and learn to apply them to their practices. Without such knowledge and perspective, they are likely missing the tools with which to capture valuable insight into not only their own organizations but also the relationship between their organizations and the external environment. Every organization faces challenges to its existence over the course of time.

By gaining an understanding of complexity principles, and the value of a more organic and less mechanistic approach, leaders may create a more symbiotic organization-environment relationship and make more astute decisions regarding change, whether that change may lead to adaptation or ultimately to a dissipative state by design.

Further, by exposing leaders to concepts such as self-organization and its manifestation in communities of practice, leaders can incorporate the knowledge formed in these groups with their own vision for adaptation. They can further test the strength of their vision by applying the concept of fractality within their organizations and examine the alignment of values and beliefs at various levels and sectors. That alignment should inform leaders on the cohesiveness of their organization and the challenges they face in successful adaptation of the whole.

Recommendations for Further Research

This study was an analysis, using a complexity approach, of the relationship between a CoP of physicians and the hierarchical health care organization in which it was formed and functioned. It examined adaptation of a CoP and its leadership hierarchy both to each other as separate parts of an internal environment and together as components of a whole system in relation to its external environments consisting of the county organization in which both existed and the larger economic environment in which all operated.

My first recommendation for further research is to explore the possibility of making this a longitudinal study. As written, it is based on a limited number of participants and a finite period of time. By extending it into a longitudinal study, the original participants could be re-interviewed and the number of participants could be

expanded to include more PCIG members and administrators to provide additional points of view and capture the influence the PCIG may have had after the closure of this study.

Additional lines of inquiry in this or other health care settings are recommended in four areas. First, it would be valuable to know the degree to which medical education and the acculturation process that physicians experience during internship and residency may influence the acceptance of the status quo of power relationships and adherence to hierarchical decision rules for staff physicians, medical staff, and administrative leaders. A related topic would be the examination of the influence of gender on power relationships and adherence to hierarchy. This grew out of the observation that the CoP in this study was female, and representative of the majority of the primary care physicians on the staff of the study's health care system, while the administrators were male, also representative of the majority of medical staff leaders and non-physician administrators in the study organization.

Second, I recommend investigation into the effect multiple hierarchies may have on organizational adaptation. Specifically this line of inquiry would examine the implications of having a medical staff hierarchy that governs professional practice and an administrative hierarchy that governs resource allocation, including budget and staffing that facilitates or inhibits the desired professional practice. Third, additional research is needed to improve the understanding of attractors that bring groups together and sustain them over time. This is critical to the concepts of exchange of energy and knowledge formation that are the foundation of organizational adaptation. Related to this concept would be to delve into the effect of phase transitions on the sustainability of a CoP. Fourth, and possibly the most difficult conceptually, is further research into small events

that become the precursors to larger events and trends. The difficulty lies not in the retrospective examination of sensitive dependency but in the interpretation of historical events in a ways that have meaning for present and future states.

Finally, while not an area of primary research, I recommend the expansion of the extensive literature reviews on complexity science and organizational adaptation conducted by Roberts (2006) and Kerno (2008) to continue to build the body of knowledge on measures of effectiveness of CoPs in a variety of settings and under a variety of conditions.

Concluding Thoughts

Throughout the course of this study I was awakened to the value of using complexity theory in the study of complex adaptive entities, organizational emergence and adaptation, and to the role of CoPs as moving forces in that emergence and adaptation. The personal stories related by the PCIG members demonstrated to me the power and influence of a CoP in knowledge generation, breaking down seemingly impervious barriers to communication, and using attractors to achieve momentum that resulted in personal and group fulfillment. These stories also brought forth examples of personal growth that PCIG members were enthusiastic to share. PCIG members, acting individually, felt their contribution to the health care system would have been tied to excellent patient care, but when acting in concert, made a contribution well beyond their expectations. My experience with the PCIG helped to explain what I had intuitively believed, and literature supported, prior to the study: that CoPs in hierarchical organizations can indeed support the emergence of organizations and help their sustainability. I also found that I was able to put my personal beliefs and biases aside

during the processes of interviewing and analyzing the data and let the words of the participants tell the story.

Administrators' stories were no less compelling than those of the CoP members. I developed a deeper appreciation for the struggle the administrators in this study experienced when faced with the challenge of balancing organizational needs with those of the PCIG. Administrators were candid and generous in sharing their personal issues with the PCIG and in their ability to see the value in its work, even if they did not agree completely with its presence in parallel to the hierarchy.

Finally, I was struck by the degree to which each and every interviewee spontaneously mentioned the importance of the health care system's mission and values. As employees of a publicly owned system, they were thoroughly invested in serving those who would otherwise not have access to care. Several mentioned that they had the choice of working in private practice, but looked on their work as a calling, a fulfilling way to serve their community. This was the most dynamic and reinforcing way in which I could possibly have come to understand the meaning of fractality and the power it has to unify otherwise disparate groups.

The research process turned out to be an amazing example of sensitive dependence. My experience of discovering the PCIG, then formulating, carrying out, and summarizing this research, with all of its twists and turns, could not have been more gratifying.

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APPENDICES

Appendix A: Research Problem, Purpose, Theory, and Questions

Research Problem: The research problem was to discover and describe the characteristics of a community of practice and the health care system within which it formed. The problem was further to explore the relationship between the CoP and the health care system that was both a hierarchical organization and a complex adaptive entity and the impact that relationship may have had on the organization's sustainability within its environment.

Purpose: The purpose of this study was to increase the knowledge and understanding of the degree to which a health care system, as both a hierarchical organization and a complex adaptive entity, recognized and fostered a CoP as part of its interrelationship with its environment. It was also designed to further knowledge of the fractal nature of an organization as realized through its leaders and one of its CoPs. Finally, the study provided insight into the emergent characteristics of a health care system and one of its CoPs.

Theory	Research Questions
1. Complexity theory, specifically self-organization and communities of practice as a type of self-organization unique to social organizations.	1. What prompted the formation of the CoP in the study health care system and illustrated the principle of self-organization?
2. Complexity theory, specifically the principles of attractors and adaptation to changing environment.	2. What conditions sustained the existence of the CoP in the study health care system and revealed attractors (such as organizational values and behaviors) that may have limited or facilitated the achievement of fitness peaks or organizational adaptation?
3. Complexity theory, specifically networks and open exchange of energy, and organizational theory, specifically hierarchy.	3. How did members of the CoP perceive their relationship to the hierarchy of the study health care system as illustrated through networks and open exchange of energy?

Theory	Research Questions
4. Complexity theory and the principles of nonlinear dynamics and sensitive dependence.	4. To what extent did the background of health care system leaders influence their attitude and behavior regarding the formation or function of the CoP, which may be described through the process of nonlinear dynamics or sensitive dependence?
5. Complexity theory and the principles of autopoiesis, attractors, and nonlinear dynamics.	5. To what extent did the CoP contribute to organizational adaptation or change in the study health care system, from the CoP and system leader points of view?
6. Complexity theory and the principle of fractality.	6. To what extent was the CoP in this study a fractal of the culture or practices of the health care system in which it was formed and functioned?

Appendix B: Protection of Human Subjects Approval

April 12, 2010

Dear Ms. Yuter:

The Institutional Review Board for the Protection of Human Subjects (IRBPHS) at the University of San Francisco (USF) has reviewed your request for human subjects approval regarding your study.

Your application has been approved by the committee (IRBPHS #10-031). Please note the following:

1. Approval expires twelve (12) months from the dated noted above. At that time, if you are still in collecting data from human subjects, you must file a renewal application.

2. Any modifications to the research protocol or changes in instrumentation (including wording of items) must be communicated to the IRBPHS. Re-submission of an application may be required at that time.

3. Any adverse reactions or complications on the part of participants must be reported (in writing) to the IRBPHS within ten (10) working days.

If you have any questions, please contact the IRBPHS at (415) 422-6091.

On behalf of the IRBPHS committee, I wish you much success in your research.

Sincerely,

Terence Patterson, EdD, ABPP
Chair, Institutional Review Board for the Protection of Human Subjects
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IRBPHS – University of San Francisco
Counseling Psychology Department
Education Building – Room 017
2130 Fulton Street
San Francisco, CA 94117-1080
(415) 422-6091 (Message)
(415) 422-5528 (Fax)
irbphs@usfca.edu
---
http://www.usfca.edu/humansubjects

Appendix C: Sample Correspondence with Prospective Participants

Yuter, Sheila

From: Yuter, Sheila
Sent: Friday, April 23, 2010 4:46 PM
To:
Subject: and now the work begins...

Hi Dr.

I've gotten the ok from both the USF and IRBs to go ahead with my interviews. My next steps are to contact each potential participant to see if they are willing to be interviewed. To do that I'll need the names of the physicians in the primary care interest group and contact information if they are not on the staff. If they are on the staff should be able to find them on the email system.

I can pick up the list from you when you're on the main campus or come over to Silver Creek if that would be easier. I'd also be happy to share the study materials (invitation letter, questionnaire, informed consent) with you, if you'd like.

Sheila Yuter
408-885-3885

Yuter, Sheila

From:
Sent: Tuesday, April 27, 2010 8:43 AM
To: Yuter, Sheila
Subject: FW: and now the work begins...

Sheila,

I would like to give my colleagues a heads-up. Can you send me a brief description of the purpose of the project, a few logistics, etc for me to send to them?
Marcie

:

Yuter, Sheila

From: Yuter, Sheila
Sent: Thursday, April 29, 2010 2:23 PM
To:
Subject: RE: and now the work begins...
Attachments: Proposal Synopsis_4_

Thanks for your quick response. I've attached a short summary of the research purpose and logistics. Just let me know if you need more detail (I tried to keep it very short). I'll get back to you in about a week to see how things are going. Many thanks,

Sheila

I am a doctoral candidate at the University of San Francisco conducting research on how an informal group works within a formal organization. It is part of a larger body of research on the subject pioneered by Etienne Wenger and Jean Lave. My study will explore whether an informal group can contribute to an organization's adaptability to its changing environment through the use of its creative or innovative ideas. A unique feature of my research is that it will look at both the work of an informal group and characteristics of the organization's leadership to better understand the elements of the organization's culture that foster or discourage the work of the informal group.

Specifically, I will be asking to interview 4 to 5 members of the primary care interest group and 3 to 4 members of your administrative hierarchy. Each individual one-hour interview will be recorded and transcribed for thematic analysis, and there may be some brief follow-up to clarify answers.

The research proposal behind this work has been approved prior by both the USF and VMC institutional review boards to assure that participants' privacy and personal interests are protected. None of the interviewees or their work site will be identified in my dissertation or any other written analyses or summaries of the data.

Sheila Yuter, Senior Program Specialist

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Yuter, Sheila

From: [redacted]
Sent: Monday, May 03, 2010 8:43 PM
To: Yuter, Sheila
Subject: RE: and now the work begins...

Sheila - I have 2 colleagues who are willing to work with you. I will try to talk to 1 or 2 others, but if you want to start with the 3 of us thus far - [redacted], and myself. We all have [redacted] addresses.

Yuter, Sheila

From: [redacted]
Sent: Tuesday, May 04, 2010 10:43 AM
To: Yuter, Sheila
Subject: RE: and now the work begins...

[redacted] is also willing to participate (also with [redacted] email)

Yuter, Sheila

From: Yuter, Sheila
Sent: Friday, June 11, 2010 4:52 PM
To: [redacted]
Subject: Request to participate in doctoral study

June 11, 2010

[redacted], M.D.
Chair, Department of Medicine
[redacted]

Dear Dr.

I contacted you a few months ago regarding your permission to present my doctoral study to the [redacted] IRB. As you probably know, the IRB did not feel that it falls under their purview, but the IRB chair indicated that the study could be conducted at [redacted] with the agreement of each individual participant being interviewed. The study has been approved by the University of San Francisco IRB, the sponsoring educational institution and, if you agree to participate, you will be asked to sign a consent form before being interviewed.

I am contacting you at this time to request your participation in an individual in-person interview that will last approximately one hour. In addition, I may re-contact you briefly to clarify parts of your responses for my analysis of our interview.

The study will examine how an informal group, also known as a community of practice, works within a traditional hierarchical healthcare organization. The informal group in this study is the primary care interest group, and the members of the organization's medical and administrative hierarchy that I am contacting are you plus the Chief of Internal Medicine, the Chief Medical Officer and the Director of Ambulatory and Community Services. This is a qualitative study consisting of a series of interviews to be analyzed against the body of literature on communities of practice.

Your name and the name of the healthcare system will not be used in any published results, summaries, or other release of findings. Study records will be kept strictly confidential. Study information will be coded and kept in locked files and password-protected computer files at all times. Only the transcriptionist and I will have access to the files. Individual results will not be shared with the healthcare system or its governing body.

I recognize how busy you are and appreciate your taking the time to participate in this study. Please let me know by return email or by phoning me at 408-885-3885 if you are willing to participate.

I will be contacting your office to follow up on any questions you may have and to set up an appointment for an interview, if you choose to participate.

Thank you in advance for considering my request,

Sheila Yuter

Sheila Yuter
Doctoral Candidate
University of San Francisco

Appendix D: Informed Consent Form and Bill of Rights

UNIVERSITY OF SAN FRANCISCO

CONSENT TO BE A RESEARCH SUBJECT

Purpose and Background

Sheila Yuter, a doctoral student in the Leadership Studies Department at the University of San Francisco, is doing a study of informal groups working within traditional hierarchical health care organizations. These groups are composed of people seeking to improve their practice or solve a problem related to how they do their work. The researcher is interested in understanding how such groups are formed, how they function in relation to the leadership structure, and the benefits they may have had for you and your organization.

I am being asked to participate because I am part of an informal group or part of the leadership team of the health care system in which the informal group exists.

Procedures

If I agree to be a participant in this study, the following will happen:

1. I will participate in a one-hour, in-person interview in which I will provide general information about myself and in-depth information about my experience with an informal group and the organization in which it exists. The interview will take place in a private area at a time that is compatible with my work schedule.
2. I will participate in a follow-up discussion to clarify information recorded during my interview and review the study findings for consistency with my

input and perceptions. The follow-up may be in a meeting, by phone, or through email and should take no more than one hour.

Risks and/or Discomforts

It is possible that some of the questions during the interview may make me feel uncomfortable, but I am free to decline to answer any questions I do not wish to answer or to stop participation at any time.

Study records will be kept as confidential as is possible. No individual identities will be used in any reports or publications resulting from the study. Study information will be coded and kept in locked or password protected files at all times. Only study personnel will have access to the files. Although all precautions will be taken to protect these records, participation in research may mean a loss of confidentiality.

Benefits

There may be no direct benefit to me from participating in this study. The anticipated benefit of this study is a better understanding of the conditions that foster and support the work of informal groups in hierarchical organizations.

Costs/Financial Considerations

There will be no financial costs to me as a result of taking part in this study.

Payment/Reimbursement

There will be no monetary compensation for participating in this study.

Questions

I have talked to Ms. Yuter about this study and have had my questions answered. If I have further questions about the study, I may call her at 408-806-0326. If I have any

questions or comments about participation in this study, I should first talk with the researcher.

If for some reason I do not wish to talk with the researcher about my concerns, I may contact the Institutional Review Board for the Protection of Human Subjects (IRBPHS), which is concerned with protection of volunteers in research projects. I may reach the USF-IRBPHS office by calling 415-422-6091 and leaving a voicemail message, by e-mailing IRBPHS@usfca.edu, or by writing to the IRBPHS, Department of Psychology, University of San Francisco, 2130 Fulton Street, San Francisco, CA 94117-1080.

Consent

I have been given a copy of the "Research Subject's Bill of Rights" and I have been given a copy of this consent form to keep.

PARTICIPATION IN RESEARCH IS VOLUNTARY. I am free to decline to be in this study, or to withdraw from it at any point. My decision as to whether or not to participate in this study will have no influence on my present or future status as a student or employee at USF or my hospital employer.

My signature below indicates that I agree to participate in this study.

_____ _____

Subject's Signature Date of Signature

_____ _____

Signature of Researcher Date of Signature

Research Subjects

Bill of Rights

The rights below are the rights of every person who is asked to be in a research study.

As a research subject, I have the following rights:

Research subjects can expect:

- To be told the extent to which confidentiality of records identifying the subject will be maintained and of the possibility that specified individuals, internal and external regulatory agencies, or study sponsors may inspect information in the medical record specifically related to participation in the clinical trial.
- To be told of any benefits that may reasonably be expected from the research.
- To be told of any reasonably foreseeable discomforts or risks.
- To be told of appropriate alternative procedures or courses of treatment that might be of benefit to the subject.
- To be told of the procedures to be followed during the course of participation, especially those that are experimental in nature.
- To be told that they may refuse to participate (participation is voluntary), and that declining to participate will not compromise access to services and will not result in penalty or loss of benefits to which the subject is otherwise entitled.
- To be told about compensation and medical treatment if research related injury occurs and where further information may be obtained when participating in research involving more than minimal risk.
- To be told whom to contact for answers to pertinent questions about the research, about the research subjects' rights and whom to contact in the event of a research-related injury to the subject.

- To be told of anticipated circumstances under which the investigator without regard to the subject's consent may terminate the subject's participation.
- To be told of any additional costs to the subject that may result from participation in the research.
- To be told of the consequences of a subject's decision to withdraw from the research and procedures for orderly termination of participation by the subject.
- To be told that significant new findings developed during the course of the research that may relate to the subject's willingness to continue participation will be provided to the subject.
- To be told the approximate number of subjects involved in the study.
- To be told what the study is trying to find out;
- To be told what will happen to me and whether any of the procedures, drugs, or devices are different from what would be used in standard practice;
- To be told about the frequent and/or important risks, side effects, or discomforts of the things that will happen to me for research purposes;
- To be told if I can expect any benefit from participating, and, if so, what the benefit might be;
- To be told of the other choices I have and how they may be better or worse than being in the study; To be allowed to ask any questions concerning the study both before agreeing to be involved and during the course of the study;
- To be told what sort of medical or psychological treatment is available if any complications arise;
- To refuse to participate at all or to change my mind about participation after the study

is started; if I were to make such a decision, it will not affect my right to receive the care or privileges I would receive if I were not in the study;

- To receive a copy of the signed and dated consent form; and
- To be free of pressure when considering whether I wish to agree to be in the study. If I have other questions, I should ask the researcher or the research assistant. In addition, I may contact the Institutional Review Board for the Protection of Human Subjects (IRBPHS), which is concerned with protection of volunteers in research projects. I may reach the IRBPHS by calling (415) 422-6091, by electronic mail at IRBPHS@usfca.edu, or by writing to USF IRBPHS, Department of Counseling Psychology, Education Building, 2130 Fulton Street, San Francisco, CA 94117-1080.

Appendix E: Community of Practice Interview Questions

I'm going to be asking you a few questions as part of a study of your community of practice (CoP). A CoP is a group that comes together to improve a process or practice, solve a problem, or learn something together. Sometimes the work benefits the group members individually, sometimes it benefits their "home" departments, and sometimes it benefits the whole organization. I want to get your views on how the process is working and how you see it benefiting you, your department or clinic, and your health care organization. We'll start with a few general questions:

1. How long have you been in practice?
2. How long have you been with this organization?
3. How long have you been in the primary care physicians group?
4. What is your position (chief, staff physician, resident, etc.)?

Now let's talk about your participation in your informal work/task group.

Research Question 1: What prompted the formation of the CoP in the study health care system and illustrated the principle of self-organization?	
Interview Questions	1. What idea or issue prompted the group to get together? 2. How did you get involved with the group?

Research Question 2: What conditions sustained the existence of the CoP in the study health care system and revealed attractors (such as organizational values and behaviors) that may have limited or facilitated the achievement of fitness peaks or organizational adaptation?	
Interview Questions	3. What motivates you to continue to work with this group? 4. Do you think the work is valuable to you? To your department? To the health care system?
Research Question 3: How did members of the CoP perceive their relationship to the hierarchy of the study health care system as illustrated through networks and open exchange of energy?	
Interview Questions	5. Tell me about any feedback you've gotten from your chief of service or department head that might relate to your participation in this group. 6. Describe any feedback you've gotten from hospital leadership/administration about the work.
Research Question 4: To what extent did the background of health care system leaders influence their attitude and behavior regarding the formation or function of the CoP, which may be described through the process of nonlinear dynamics or sensitive dependence?	
Interview Questions	7. No questions will be asked of CoP members for this RQ

Research Question 5: To what extent did the CoP contribute to organizational adaptation or change in the study health care system, from the CoP and hospital leader points of view?	
Interview Questions	8. Give me an example of how the group is achieving its purpose. 9. Has your group's work has been used by other departments or disciplines?
Research Question 6: To what extent was the CoP in this study a fractal of the culture or practices of the health care system in which it was formed and functioned?	
Interview Questions	10. To what extent do you think that the group's work has been accepted by your department or discipline? 11. What would you change about the group to make it more compatible with the needs or values of your department, discipline, or this health care system?

Appendix F: Administrator Interview Questions

I'm going to be asking you a few questions as part of a study of a community of practice (CoP) in your hospital and your views as a member of the executive team of this hospital. A CoP is a group that comes together informally with a common interest in improving a process, solving a problem, or learning something new about their field of practice. Sometimes the CoP's work benefits the group members individually, sometimes it benefits their "home" departments, and sometimes it benefits the whole organization. I want to get your views on how you see this kind of activity benefiting your hospital. We'll start with a few general questions:

1. How long have you been with this hospital?
2. How long have you been a in your current position?
3. Have you ever been part of a CoP? Tell me a bit about that experience.

Now let's talk about your views on this hospital's means of adapting to the changing health care environment.

Research Question 1: What prompted the formation of the CoP in the study health care system and illustrated the principle of self-organization?	
Interview Questions	1. Tell me about your management philosophy. 2. How would you describe the hospital's process to anticipate or respond to change in the health care environment (e.g. technology, reimbursement, staff shortages)? Follow-up question might be, "Do you direct that committees or task forces be formed, or do you take a more voluntary approach to soliciting ideas?" 3. How do operational problems come to your attention (e.g., high infection rates, low productivity, poor patient satisfaction), and how do you respond? Might prompt a follow up question as above in #2.
Research Question 2: What conditions sustained the existence of the CoP in the study health care system and revealed attractors (such as organizational values and behaviors) that may have limited or facilitated the achievement of fitness peaks or organizational adaptation?	

Interview Questions	4. How would you describe the hospital's culture, focusing on the relationship between management or formal leadership and staff physicians? 5. To what extent do you feel that your management philosophy and values encourage informal groups to work within the formal structure?
Research Question 3: How did members of the CoP perceive their relationship to the hierarchy of the study health care system as illustrated through networks and open exchange of energy?	
Interview Questions	6. No questions will be asked of senior management for this RQ.
Research Question 4: To what extent did the background of health care system leaders influence their attitude and behavior regarding the formation or function of the CoP, which may be described through the process of nonlinear dynamics or sensitive dependence?	
Interview Questions	7. How has your journey to your current position influenced your management philosophy? 8. If participant has had previous experience with a CoP, then "How has your experience with a CoP influenced your approach to informal groups?"

Research Question 5: To what extent did the CoP contribute to organizational adaptation or change in the study health care system, from the CoP and system leader points of view?	
Interview Questions	9. How do you feel about the potential contribution of the work of informal groups (CoPs) to the hospital's ongoing adaptation to the changing health care environment?
Research Question 6: To what extent was the CoP in this study a fractal of the culture or practices of the health care system in which it was formed and functioned?	
Interview Questions	10. How do you see your management philosophy being carried out at different levels of the organization for which you are responsible?

Appendix G: Health Care System Research Sites and Researcher's Location