INTRODUCTION

As sociologists, we are currently developing a theory and method for the study of social complexity, which we call, respectively, social complexity theory and assemblage—collectively referred to as SCAT. The purpose of SCAT is to help sociologists discover, assemble and analyze various social phenomena as complex social systems. A technical account of our theory and method is the subject of a forthcoming book, The Sociology of Complexity.

Our method, assemblage, is based on the following principle: a complex social system (CSS) is best understood by building it from the ground up. Assemblage is therefore a bottom-up approach to modeling (see Klüver, Stoica and Schmidt 2003). The major strength of assemblage is that it is a general purpose method: it works equally well with and can integrate different types of data and data analytic techniques (e.g., Castellani 2000; Castellani, Castellani and Spray 2003). This gives assemblage an advantage over most methods currently used in complexity science: it can be used to conduct qualitative and historical complexity science analysis.

To date, other than a small network of researchers, little time has been devoted to developing a qualitative or historical approach to studying complex social systems (e.g., Agar, 2003; Castellani and Hafferty 2006; Castells 2000; Diamond 2004; Luhmann 1995; Miller, Crabtree, McDaniel and Stange 1998; Urry 2003). Instead, the literature is dominated by computational approaches, ranging from dynamical systems theory to agent-based modeling to data mining (e.g., Byrne 1998; Casti 1999; Cillies 1998; Gilbert and Abbott 2005; Gilbert and Troitzsch 2005; Holland 1998). While these techniques are very important and incredibly powerful, more research needs to be done on 1) the development of non-computational techniques (e.g., Anderson, Crabtree, Steele and McDaniel, 2005; Castellani 2000), and 2) the integration of computational method with qualitative and historical method (e.g., Agar 2005; Castellani, Castellani and Spray 2003; Castellani and Castellani 2003).

The reason a broader and more mixed-method toolbox is necessary is because, often times, the types of complex social systems sociologists study do not lend themselves to computational analysis alone. This is particularly true when it comes to the study of such phenomena as complex human organizations or the historical development of a profession or society. What is needed, instead, is a combination of techniques and methodological perspectives. It is for this reason, as mentioned above, that a growing network of scholars in sociology and the social sciences are devoting their attention to the development of qualitative, historical and mixed-method approaches to complexity science. This includes, for example, the development of case study research for the study of complex human organizations (Anderson, Crabtree, Steele and McDaniel 2005), the translation of ethnography into computational modeling (e.g., Agar 2005), the qualitative development of fuzzy logic (e.g., Ragin 2000), and, in the case of the current authors, the integration of grounded theory method and artificial neural networking (e.g., Castellani, Castellani and Spray 2003).

Our purpose in this study is to provide an example of how to do qualitative-historical complexity science. To do so, we apply assemblage to the historical evolution of medical professionalism in the United States between 1976 and 2006. Our paper is an extension of an earlier version forthcoming in Wear’s Medical Professionalism: A Critical Review (2006).

Our paper is organized according to the basic steps of assemblage. They are as follows: 1) conceptualize the topic of study as a CSS, 2) develop and manage the study’s database, 3) formulate the research question in complex systems terms, 4) construct and manage the study’s database, 5) situate the CSS of study in its larger field of relations, 6) develop the CSS’s web of subsystems, 7) use the web of subsystems to develop the CSS’s network of attracting clusters, 8)
Given the constraints of time and space, we cannot present a comprehensive overview of our method, nor can we detail its application to the topic of medical professionalism. We can, however, give the reader a general impression of how assemblage works and its utility for historical, qualitative analysis. If our overview convinces the reader of the potential viability of doing complexity science historically and qualitatively, then we will deem our paper a reasonable success.

**STEP 1: Turing a Topic of Study into a Complex Social System**

Assemblage begins with the following basic questions. If these questions are answered in the affirmative, then the researcher can move on to the next step.

- **A.** Can my topic of study be conceptualized as a complex social system?
- **B.** Does this conceptualization provide a potentially useful way to address my research question?
- **C.** Can I construct an initial overview of what my topic might look like as a complex social system? Can I do so visually or as a narrative?
  - **a.** What theoretical framework will I use to conceptualize my topic as a complex social system?

Our decision to pursue the current study was the result of a series of conversations we had about medical professionalism and complexity science. We repeatedly asked ourselves a basic question: “Is the current discourse on professionalism in United States medicine truly singular and totalizing, or is it "privileged," meaning that there are other ways of practicing medical professionalism but they are hidden or overshadowed by the current dominant discourse?”

During our conversations two issues, in particular, initially suggested the latter: the increasing relevance that lifestyle and personal morality seem to play in the professional behavior of USA medical students and medical residents, which a number of publications have addressed (e.g., Rippe, 1999; Wear & Castellani, 2002), and the extent to which the professionalism of practicing physicians seems to be infused with an “entrepreneurial spirit” (e.g., Hafferty 2005). It appeared to us that both of these factors were not just diminishing the current “discourse on professionalism.” Instead, they seemed to be the basis for entirely new ways of practicing professionalism. Inspired by these initial insights, we began to conceptualize professionalism as a complex system, to think of it as comprised of several different clusters of professionalism, and to begin building a database that would support such an argument.

The theoretical framework we used in this study is the one we have been developing for the past couple of years, which we call social complexity theory—the other half of SCAT. From this perspective, a CSS is comprised of a web of subsystems, which represent all of the major factors (i.e., variables, components, indicators, rules) that form the system’s structure. The social agents in the CSS practice this web of subsystems in various ways. Their different ways of practicing this web of subsystems eventually self-organize to form a network of attracting clusters, which represent the major attractor points in the system. These clusters interact with one another to influence the various trajectories, both major and minor, along which the CSS evolves. A CSS is also situated within a larger field of relations, which represent the major environmental forces perturbing that impact it. A more detailed overview of our theory is the subject of our forthcoming book, *The Sociology of Complexity*.

Based on our conversations, and through the usage of our theory, we arrived at the following thesis: Efforts within organized medicine in the United States over the last twenty
years to re-establish an ethic of professionalism have obscured the fact that currently there are several competing clusters (types) of medical professionalism, each of which represents a unique approach to medical work. Stated differently, the “professionalism” that has emerged within academic medical journals, conferences, debates, and discussions in the United States over the past twenty years is a highly selective and privileged narrative, developed and delivered by one, possibly two, particular strata within the organizational structure of medicine. We call this ‘strata’ the ruling class of medicine, and we refer to its medical professionalism as nostalgic. The other clusters of medical professionalism that we believe exist are entrepreneurial, empirical, lifestyle, unreflective, academic, and activist professionalism.

STEP 2: Formulating the Research Question in Complex Systems Terms
In formulating the research question, the following issues need to be addressed:

A. In terms of my complex social system of study, what issue do I want to address?
B. How can I conceptualize my research question in complex systems terms?

As stated above, the basic issue we wanted to address is whether physicians in the United States are currently practicing more than one type of medical professionalism. Having begun the process of assembling the topic of medical professionalism into a complex social system for study, we constructed the following research questions:

1. Is there currently more than one type of medical professionalism?
2. What environmental perturbation(s) is/are responsible for the emergence of these additional types of professionalism?
3. What is the web of subsystems (system structure) upon which these different types of professionalism are based?
4. In terms of a thick description, how would we describe the different types of medical professionalism?
5. How do these different types of medical professionalism come together to form a network of attracting clusters?
6. What are the relationships amongst these different clusters of professionalism?
7. What impact is the environment having on the relationship between these clusters?
8. What impact are these clusters and their relationships with one another and the external environment having on the overarching trajectory of the system of medical professionalism in the United States?

STEP 3: Choosing a Method of Analysis and Study Design.
The next step is to choose a method of analysis and study design that best suits the research questions being asked. Examples of the questions regarding method and design that need to be addressed include the following:

A. Is my study cross-sectional or longitudinal?
B. Am I collecting real data or generating simulated data?
C. Is my focus discovery, explanation, or prediction?
D. Does my question require a mixed-methods design?
E. What is the level of analysis?
F. How large or complex will the database be? In other words, does the size or type of data being collected negate or require certain types of method?

In the case of the current study, our focus is on discovery and our study is longitudinal: we are trying to determine if and how different types of medical professionalism emerged
between 1976 and 2006 and what impact their emergence is having on the overall trajectory of medical professionalism. We therefore chose to conduct a qualitative-historical analysis. We chose this approach because we are analyzing documents which do not lend themselves, initially, to computational or statistical analysis. Later confirmatory analysis could be done, for example, through a citation (network) analysis to determine if the seven clusters of professionalism we arrived at are real. A computer simulation could also be conducted to determine if our historical analysis and predictions about the future trajectory of medical professionalism have a degree of validity and reliability. Finally, a qualitative study or survey could be conducted to see if physicians in the United States 1) see themselves as practicing the various types of professionalism we have identified, 2) agree with our assessment of the impact the forces of decentralization have had on their professionalism, and 3) agree with our understanding of how the various types of professionalism are currently interacting with one another and which cluster or clusters has the biggest impact on the future direction of medical professionalism.

**STEP 4: Constructing and Managing the Database.**
The next step is to use the tools of data mining to construct and manage the study’s database. The emphasis here is on intelligent data management. This approach to building the database is particularly important if the study is longitudinal.

The study of a CSS requires the collection and management of, at minimum, two interdependent databases. The first is for the CSS of study and the second is for the environmental forces impacting the CSS of study.

As explained in the next step, depending upon the role environmental forces play in the CSS of study, it may be necessary to conceptualize one or more of these forces as a complex system, be it physical, biological, ecological, psychological or social. In this case, the study becomes the analysis of a particular CSS and the various complex systems it is interacting with.

For the current study, the database for the field of relations came from the current USA discourse on medical professionalism, which includes the professional dominance, deprofessionalization and medical professionalism literature, as well as any published empirical studies on the professional behavior of medical students, medical residents and physicians (e.g., Hafferty & McKinlay, 1993; Hafferty & Light, 1995). Additional materials came from articles, commentaries, responses and related material dealing with medical professionalism that were found in various American medical sociology journals and more popular American publications such as the New Yorker, Wall Street Journal, and New York Times. In terms of the database for the CSS of study, in addition to the above information, we also included letters to the editors, reviews and reports published and/or distributed by such leading organizations as the American Board of Internal Medicine (ABIM), the Association of American Medical Colleges (AAMC), the Accreditation Council on Graduate Medical Education (ACGME), the National Board of Medical Examiners (NBME), and the Liaison Committee on Medical Education’s (LCME).

**STEP 5: Assembling the Field of Relations and the CSS Environment**
The field of relations comprises all of the components necessary for assembling the CSS of study and the environmental systems in which it is situated. At this point in the study, the specific questions that need to be addressed pertain to the environment in which the CSS of study is situated. Examples include the following:

A. Which environmental forces should I focus on?
B. How will I conceptualize these environmental forces?
   a. Will I conceptualize these forces as complex systems?
In terms of the current study, the most important environment factors we identified were the forces of decentralization. Given the preliminary nature of this study, we did not conceptualize these forces as a complex social system (see below). An abridged narrative of the relevance of these forces for the study of medical professionalism is as follows.

Every graduate student specializing in medical sociology in the United States is introduced at some level to the following storyline of 20th century American medicine, as told by sociology. This sociological story begins early in the 20th century with Carr-Saunders & Wilson's *The Professions* (1933/1964). This phase is known as the reform and initial rise of organized medicine, and is characterized by a period of profound and rapid development, during which medicine not only grew in scientific and technical competence, but also in status and legitimacy (e.g., Starr, 1982). The second phase, which begins around the 1940s and continues onward through the 1960s, is known as medicine’s phase of professional dominance. As analytically dissected in Eliot’s Freidson’s twin classics, *Professional Dominance* (1970) and *Profession of Medicine* (1970), organized medicine rose to the top of health care system and the professional class pyramid between the 1940s and the 1960s by controlling the production of medical knowledge, exercising authority over the division of medical labor, supervising and regulating the provision of health services, and maintaining control over the organization of medicine and the health care system. Additionally, medicine gained economic, political and cultural power by continuing to convince the economic and governmental elites, as well as the general population that what it did as a profession was both valuable and necessary and required little to no outside regulation.

The 1960s and 1970s, however, brought a whole new set of challenges that organized medicine, despite all of its efforts, was unable to effectively counter. These challenges included the skyrocketing costs of health care; the transformation of medicine from a cottage industry to a corporate "player" on Wall Street; the emergence of Medicare, Medicaid, and managed health care; the corporatization of medicine, which turned medical knowledge and treatment into a commodity; the patient-consumerism movement; the rise and competition of other health care professions (e.g., nursing, physician-assistants, etc); advances in medical and biomedical technology; cultural and academic challenges to the professional legitimacy of medicine; and the computer and information revolution, which increased the surveillance of physicians by various bureaucratic formations, including the federal government, evidence-based medicine, patient safety, physician report cards, health insurance panels, review boards, accrediting agencies, hospital administrations, and patient and intellectual watch-groups.

Within the medical sociology literature, this complex set of factors represent the third phase of medicine’s history (e.g., Hafferty & McKinlay, 1993; Hafferty & Light, 1995), which medical sociologists describe as one of deprofessionalization (Haug, 1988), proletarianization (McKinlay & Arches, 1985) and corporatization (e.g., McKinlay & Stoeckle 1980). In this essay, we group all of these challenges under the single heading, forces of decentralization.

Establishing the forces of decentralization as our larger field of relations, we arrived at the following (albeit tentative) conclusion. For the last thirty years, organized medicine has been situated within a larger field of relations that has consistently, and rather successfully, challenged its longstanding position of professional dominance. In response to these forces of decentralization, physicians began to practice other types of professionalism, which lead to the development and emergence of several competing clusters of medical professionalism. This is not to say that some of these clusters did not exist prior to this phase. In fact, it is entirely reasonable that even during the first half of the 20th century, when the narrative of “nostalgic professionalism” was dominant, that there might have been several other clusters of professionalism. What changed in the third phase, however, was that the forces of decentralization massively decreased the ruling class’s position of power, allowing for the emergence and growth of several already existing and newly forming clusters, specifically entrepreneurial, empirical, and lifestyle professionalism.
The problem, as we see it, is that because the ruling class of medicine has so desperately spent the last thirty years fighting the forces of decentralization, it has not realized that its campaign to re-establish professionalism has not only been challenged by the larger systems of which it is a part, it has not even been embraced by many of its own members, the rank-and-file of medicine. In fact, many physicians, such as those practicing an entrepreneurial, empirical, lifestyle or activist professionalism ‘flat out’ reject the traditional tenets of "nostalgic professionalism. These alternative forms of professionalism have been supported in their resistance by the larger forces of which they are a part, which include the corporatization of medicine, the newly emerging culture of the professional class and generation X, the feminization of medicine, the continued problems of health care costs and third-party insurance, and the economic troubles of state and federal government. In short, medical professionalism is not what it used to be; it is a whole new and very complex social system.

**STEP 6: Assembling the Web of Subsystems**

With the environment established, the next step is to begin assembling the CSS of study. This begins with the construction of the CSS’s web of subsystems. Examples of questions to be addressed include the following:

1. What is the underlying conceptual structure of my CSS?
   a. Here the researcher can think of this conceptual structure in terms of variables, historical forces, experiences, concepts, dimensions, etc.
2. Can this structure be organized or clustered into a set of subsystems?
   a. Here the researcher can think of this clustering or grouping in factor analytic, clustering, principle component or causal modeling terms.
3. Do these conceptual domains overlap? Are their boundaries fuzzy?
4. Are any of these systems sufficiently complex that I need to treat them as a complex system, be that system physical, biological, psychological, social or ecological?
5. Do any of the complex subsystems identified need to be broken down further into a 2nd order web of subsystems?
6. Going still further, can these additional 2nd order subsystems be broken down into some n-th level web of subsystems?

In terms of the current study, we conceptualized the web of subsystems for medical professionalism according to ten key aspects of medical work. Our rationale for doing so is based on our training as medical sociologists. Unlike the majority of scholars in academic medicine in the USA who conceptualize professionalism as a set of values or "value orientations," we see professionalism as a way of organizing work, such that an occupation can claim the status of profession (Freidson, 2001). Some of these ways of organizing work amount to specific value orientations (as in the case of altruism) or beliefs (as in the case of social justice), while others represent specific skills (such as technical or interpersonal competence) or ways of controlling the position of an occupation within the larger bureaucratic structure of which it is a part (as in the case of autonomy and professional dominance).

As shown in Table 1, the ten key aspects of medical work that we arrived at, and our basic working definitions of them, are as follows. **Autonomy** is defined as discretionary decision making; you do your work the way you think it should be done (e.g., Hsia, 2001; Schneider, 1998). **Commercialism** is the application of business principles to medical practice and the turning of medical knowledge into a commodity (e.g., Bodenheimer, 1999; Lindorf, 1992). **Social Justice** is the idea of medicine as fairness (e.g., Daniels, Light, & Caplan, 1996). **Social Contract** is the covenant between medicine and society with reciprocal rights and obligations (e.g., Caelleigh, 2001; Coulehan, Williams, Van McCrary, & Belling, 2003). **Altruism** is placing the welfare of patients ahead of one’s own (e.g., McGaghie, Mytko, Brown, & Cameron, 2002;
Schiedermayer & McCarthy, 1995). Professional Dominance describes an organizational arrangement where medicine is in a position of control over the organization, delivery and payment of health care (e.g., Freidson, 1970a, 1970b; Hafferty & McKinlay, 1993). Technical Competence and Interpersonal Competence refer to the possession of the appropriate skills related to diagnosing, treating and communicating well with patients and others. Lifestyle Ethic is the devaluation of work in relationship to personal and family life (e.g., Rippe, 1999; Schwartz, Jarecky, Strodel, Haley, Young, & Griffen, 1989). Personal Morality is one’s own personal (as opposed to professional) belief system (e.g., Fox, Arnold, & Brody, 1995).

STEP 7: Assembling the Network of Competing Clusters

The next step is to determine the various ways in which the CSS of study has been (in the near or distant past), is currently (given some time frame) and will be (in the near or distant future) practiced by the various social agents of which it is comprised. We call this the network of attracting clusters.

Following a computational modeling perspective, the network of clusters is constructed from the bottom-up. The steps are as follows:

1. Determine which social agents best represent the CSS of study. These social agents can range from individuals and social groups to organizations or countries.
2. Once the social agents have been identified, begin to determine how these various social agents go about putting into practice the web of subsystems.
   a. Using your chosen method of analysis, for each social agent:
      i. Construct an individual profile based on the agent’s practice of the web of subsystems 1st through nth.
      ii. Sort these individual profiles into groups according to their relative similarity and differences.
3. Begin to think of these groups as the attractor points in the CSS of study
4. Begin to treat the way in which the agents cluster around these attractor points as the main ways the CSS of study can be practiced.
5. Using one’s chosen method of analysis construct a narrative of for each of the clusters.

Our process of analysis led us to the discovery and articulation of seven different types of medical professionalism: nostalgic, unreflective, academic, entrepreneurial, empirical, lifestyle, and activist. To emphasize the relative importance that each cluster attaches to the different approaches to medical work, we grouped the ten subsystems for each cluster into three basic sets: most important, moderately important and least important.

Given the constraints of time and space we cannot review all seven clusters. We can only focus on the three most important: nostalgic, entrepreneurial and lifestyle professionalism. For our review, we explain each cluster’s a) unique approach to practicing the web of subsystems; b) major social agents; c) relative position and power in the network of clusters, d) development and evolution over the last thirty years, and e) relationship to the forces of decentralization.

Nostalgic Professionalism and the Ruling Class

For us, the ruling class of medicine is made up of those individuals, groups and organizations that hold an elite status within organized medicine, including the leaders of academic medicine and medical education, the editors of many of the first-tier medical journals such as Academic Medicine, The New England Journal of Medicine, and the Annals of Internal Medicine and various organizations and groups such as the American Board of Internal Medicine (ABIM) and the Association of American Medical Colleges (AAMC), the Accreditation Council
on Graduate Medical Education (ACGME), the American Medical Association (AMA), and the Liaison Committee on Medical Education’s (LCME). We call this group the “ruling class” because their positions of privilege and authority have afforded them to have a profound influence on the “academic” discourse of medical professionalism over the past thirty years. So much so that their nostalgic professionalism has become the discourse of medical professionalism and is “used by administrators, clinical faculty, residency programs, and professional organizations with the expectation of shared meanings and goals” (Wear & Kuczewski, 2004, p. 1).

We call the ruling class’s professionalism nostalgic because their campaign—which Wear and Kuczewski call a social movement (2004)—does not advocate a new professionalism, one that reflects the profound external changes and challenges facing organized medicine. Instead, it advocates (attempts to re-establish) a “professionalism of old” for which they long—a professionalism that is grounded in autonomy and dominance and equally important a professionalism that houses an immense disdain for commercialism. It is within this narrative that commercialism is most unilaterally cast as the antithesis and enemy of "medical professionalism." Their solution is to re-establish professional dominance over it. In this way, nostalgic professionalism is conventional, mainstream medical professionalism, as it has been idealized by organized medicine and the social sciences for the past hundred years (e.g., Starr 1982).

**Entrepreneurial Professionalism**

In almost direct opposition to nostalgic professionalism stands entrepreneurial professionalism. Interestingly enough, while this cluster has grown in significance over the past twenty years, it is not new. As any historian of USA medicine knows, there has always been an entrepreneurial element to medical work and there have always been physicians who have practiced medicine as a business (e.g., Brown, 1979; Lewis, 1925/1998; Starr 1982). In fact, this “entrepreneurial spirit” was the commercialism that organized medicine sought to get rid of—with considerable success—during the late 1800s and early 1900s. What changed in the 1980s was the discovery by Wall Street of clinical medicine as a profit center and in so doing so re-invigorated an ethic of commercialism within the exam and operating rooms of clinical medicine, legitimating the desire of a significant number of physicians to ground their professionalism in the ethics of business. And so was born entrepreneurial professionalism (e.g., Hafferty, 2004, 2005).

Entrepreneurial professionalism is comprised of physicians from just about every area of medicine, ranging from physicians who started their own specialty surgery or imaging centers to those practicing boutique and retainer medicine, to those performing vanity plastic surgery or selling Amway products in their offices (e.g., Hafferty, 2005). Despite these differences, the theme of this cluster is consistent. In the past thirty years, the costs of health care have skyrocketed, patients are not as safe as they should be, too many patients have no or poor health care insurance, and too many physicians fail to practice according to the evidence. By grounding the organization, delivery, and payment of health care in the principles of business, entrepreneurial professionalism—at least as an ideal type—can fix these problems, guarantee a better product to a larger number of patient-consumers, and do so at a cheaper price. This, they believe, will lead to a better health care system for everyone.

**Lifestyle Professionalism**

Riding on the back of entrepreneurial professionalism is the newest and youngest of the seven competing clusters: lifestyle professionalism (e.g., Rippe, 1999). Lifestyle professionalism is the culmination of some of the most important economic, cultural and political changes of the last forty years. In addition to the forces of decentralization, it includes the civil rights
movement, the counterculture movement of the 1960s and 1970s, the rise of professional class
culture, the feminization of medicine, the environmental movement, and the emergence of the
postmodern, global society in which we now live. Its most immediate force, however, is
entrepreneurial professionalism because, without the proliferation of new practice opportunities,
including the possibility of working in a shared practice, a salaried part-time position, or as a
locum tenens (a temporary or "substitute physician" who is brought in to cover for another
physician who is on vacation, ill, or otherwise not able to work) lifestyle physicians would not be
able to practice the alternative forms of work in which they are interested.

The physicians practicing lifestyle professionalism range from part-time female
physician-mothers (e.g., Wear & Castellani, 2001) to physicians interested in working with fewer
patients to physicians (and this is the majority of this cluster) who simply do not want to work
that hard. Despite these differences in outlook and motivation, the general age and theme of
lifestyle professionals is the same. These are younger physicians (usually under 40) who believe
that nostalgic professionalism over-emphasizes work at the exclusion of other values and social
institutions—such as personal and family life, friends, marriage, physical and mental health,
hobbies and even fun. They believe that the current workaholic attitude of traditional medicine is
bad for the health and well-being of physicians and their patients. As such, lifestyle
professionalism is all about "balance." Even when it comes to altruism, for example, lifestyle
professionals believe there should be a balance between one’s self and the needs of patients. For
some, this means that one must take care of oneself before one can adequately care for others. In
either case, lifestyle professionals believe that their approach to professionalism leads to a win-
win situation for everyone (e.g., Rippe, 1999; Young, & Griffen, 1989).

Activist Professionalism

Of the seven clusters presented here, the most consistent in size and stature over time
(tracing all the way back to the early 1900s), is activist professionalism (Starr 1982). Basically,
this is a historically small and ideologically "focused" group. They also, with respect to the
currents of traditional professionalism, are a rather marginalized group (e.g., Brown, 1979;
Burrow, 1977). Because of their small group size and homogeneous value system, this cluster is
composed both of rank-and-file physician activists along with those like Paul Farmer (2003),
Howard Waitzkin (1991) and David Hilfiker (2002) who have found a media outlet (academic or
"popular") for their views. Physician activists range from those who work in public health and
community medicine to those who provide medical care for underrepresented and underserved
populations to those who campaign for national health care (e.g., Physicians for a National Health
Program).

The dominant concern of this cluster is social justice. They take their Hippocratic Oath
very seriously, believing that medicine is not a business, a research institute, an elite occupation,
ail, a lifestyle, or a way to rise in income, status or power. Instead, they believe in living their
commitment to their patients and to society to provide the care that is needed. It is for these
reasons that they place high priority on social justice, social contract and altruism, and rank low
the issues of commercialism, lifestyle and professional dominance. There is, however, a critical
irony here. These are the physicians who best exemplify, in terms of their daily work, the ideas
and ideals of a self-less professionalism. These are the altruists. At the same time, activist
physicians are generally seen by their peers as professionally deviant. It is for this reason that we
refer to them as activists: it makes it clear that their level of commitment to the health and
wellbeing of patients is politically, economically, culturally, and, most important,
organizationally outside the boundaries of what is considered professionally normal.

STEP 8: Assemble the Grid of Intelligibility

Drawing upon the information collected in steps one through seven, the next step is to construct a
visual and narrative overview of the entire complex social system of study. This is done by
constructing the grid of intelligibility. When conducting a qualitative-historical study, the grid is constructed in the following manner.

1. The first step is to outline the web of subsystems. As shown in Map 1, the web is placed at the bottom. This helps to remind the reader what the network of clusters is based upon.

2. The next step is to situate the network of clusters on the grid. Drawing upon the various visualization techniques used in social network analysis, neural networking, grounded theory and situational analysis, the grid is constructed to function as an n-dimensional conceptual space. If the study is cross-sectional, then the grid is, at minimum, two-dimensional. However, it can comprise of up to four dimensions, including time.

   Generally, we have found it best to situate the most important clusters first and then to situate the other clusters in relation to them. Clusters are situated in terms of their importance to the overall system and in terms of their importance (conceptual distance) to one another. Because most historical studies lack a way of demonstrating this importance numerically, the positioning of the clusters may be somewhat arbitrary. It is for this reason that the usage of additional methods if often helpful. As Map 1 shows, and as we explained in our earlier narratives for each of the clusters, the grid for medical professionalism resolves around the conflict between nostalgic and entrepreneurial professionalism. The other five clusters are positioned in relation to these two. The two most important to entrepreneurial professionalism are lifestyle and empirical professionalism. The most important, in decreasing order, to nostalgic professionalism are academic, unreflective and activist. In many ways, activist professionalism is marginal to all the other clusters and is therefore situated on the far left of the map.

3. Another way to represent the relative importance of the clusters is in terms of the size of the circles and fonts. As shown in Map 1, the two largest clusters and fonts are given to nostalgic and entrepreneurial professionalism.

4. The fourth step is to establish the links between the clusters. Links can be conceptualized in several ways: their strength (weak, moderate, strong), valence (positive, negative), impact (direct, indirect), type (collaborative, hostile, negotiated) and so forth. Again, additional techniques such as those used in social network analysis could be used to provide numerical representation.

   As shown in Map 1, the strongest and most collaborative relationship in our network of clusters is between entrepreneurial and lifestyle professionalism. This relationship, however, is indirect, moving primarily from entrepreneurial to lifestyle professionalism: as we hinted at earlier, entrepreneurial professionalism has opened up new ways of practicing medicine for lifestyle physicians in the United States. In response, the lifestyle choices of younger physicians have indirectly reinforced the promotion of a more entrepreneurial mindset in the profession as a whole. The most hostile link is between nostalgic and entrepreneurial professionalism: it is negative and direct, moving from entrepreneurial to nostalgic.

5. The next step is to demonstrate visually the role environmental forces play in the conceptual organization of the grid. In terms of medical professionalism in the USA, the most important environmental forces are the forces of decentralization, specifically commercialization. As Map 1 shows, the forces of commercialization have their most direct impact on entrepreneurial, lifestyle and empirical professionalism. We therefore situated these forces on the lower right of the grid.

6. The next step is to cull together all the above information to make some predictions about the overall trajectory of the complex social system of study. In some cases, researchers may not want to make such predictions. In the case of medical professionalism, we did.

   The direction and relative importance of the overall trajectories of the system can be visualized in terms of length, type and thickness of the lines used. As Map 1 shows, the dominant trajectory of medical professionalism in the United States is moving away from the side of nostalgic professionalism through the middle of entrepreneurial and lifestyle professionalism,
with an offshoot moving upward through empirical professionalism. A second but important trajectory is downward and toward the left, moving somewhat in the direction of academic and activist professionalism.

7. The next step, which does not always need to be done, is to demonstrate how the grid of intelligibility changes over time. This depends upon the goal of the researcher. If a longitudinal study is chosen, then several graphs or some type of JavaScript-based movie could be constructed to show how the size, position, and the links between the clusters change over time (including the emergence or disappearance of clusters), and the emergence and evolution of the system’s different trajectories.

8. With the above steps complete, the final goal is to put the information together into some form of narrative.

STEP 9: Repeat Steps One through Eight.
Before the final narrative is written, steps one through eight are repeated until a point of theoretical and methodological saturation is achieved. Here is our final sample narrative.

Based on our empirical analyses, we concluded that for the last thirty years the professional dominance of American medicine has been consistently and rather successfully challenged by a series of decentralizing historical forces that go by the names of deprofessionalization, corporatization and proletarianization. More specifically, these forces have undermined the traditional professionalism of the ruling class of medicine, allowing for the rise in power and size of an alternative network of competing clusters. Still, for all of this change, it appears that the nostalgic professionalism of the ruling class currently maintains a position of dominance, particularly within academic medicine and medical education. But, this may not be for long.

Remembering that these clusters of professionalism do not exist in isolation from one another, and that as a network they represent medical professionalism’s response to the forces of decentralization, it seems to us that entrepreneurial professionalism and lifestyle professionalism may be in a unique position to take over. These two narratives seem to be more in line with the “times,” so to speak. The forces of decentralization, specifically commercialism, seem to be fueling their continual rise in size and power, particularly over the last ten years. This potential takeover may be further reinforced by the fact that the ruling class has done little to align itself with its more natural ally, activist professionalism. The ruling class also has failed to recognize the lifestyle professionalism of younger physicians, medical residents and students as a viable competing force. This is made further problematic by the potential of rank-and-file academic physicians to treat professionalism as a strictly academic affair and for the majority of older practicing physicians to remain on the sidelines in terms of recognizing or reflecting on what is happening.

Still, our results are preliminary. Further research needs to a) examine our conceptualization of professionalism as medical work; b) determine the empirical validity of the seven clusters we identified; c) decide if any of these clusters overlap with each other or are comprised of a series of sub-clusters; and d) examine the impact these competing clusters are having on each other and the system of medical professionalism as a whole.

CONCLUSION

Despite the need for additional research, we believe our basic point is foundational. While the exact number of competing clusters is open for debate, and while the ten subsystems may be modified or redefined, it is clear that there is there is much to be gained from conceptualizing medical professionalism as a complex social system and that conducting a qualitative-historical analysis of this complex social system has proven beneficial insomuch as it has show that 1) more than one discourse of medical professionalism exists and 2) that the trend
in this system is away from a traditional view of practicing medicine toward a more entrepreneurial and lifestyle approach. We hope this inspires other complexity scientists to perform similar types of inquiries.

REFERENCES


Rippe JM. 1999. Lifestyle medicine. MA; Blackwell Science


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Map 1: Grid of Intelligibility for Medical Professionalism

Network of Competing Clusters

Unreflective
Entrepreneurial
Nostalgic
Activist
Academic

Empirical
Lifestyle

Social
Justice
Professional
Dominance
Technical
Competence
Social
Contract
Interpersonal
Competence

Commercialism
Altruism
Lifestyle
Autonomy

Market
Government

Web of Subsystems

1st Order

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