

WILEY

Environmental Jolts and Industry Revolutions: Organizational Responses to Discontinuous Change

Author(s): Alan D. Meyer, Geoffrey R. Brooks and James B. Goes

Source: *Strategic Management Journal*, Vol. 11, Special Issue: Corporate Entrepreneurship (Summer, 1990), pp. 93-110

Published by: [Wiley](#)

Stable URL: <http://www.jstor.org/stable/2486672>

Accessed: 03/10/2014 13:52

Your use of the JSTOR archive indicates your acceptance of the Terms & Conditions of Use, available at <http://www.jstor.org/page/info/about/policies/terms.jsp>

JSTOR is a not-for-profit service that helps scholars, researchers, and students discover, use, and build upon a wide range of content in a trusted digital archive. We use information technology and tools to increase productivity and facilitate new forms of scholarship. For more information about JSTOR, please contact support@jstor.org.



<http://www.jstor.org>

Wiley is collaborating with JSTOR to digitize, preserve and extend access to *Strategic Management Journal*.

ENVIRONMENTAL JOLTS AND INDUSTRY REVOLUTIONS: ORGANIZATIONAL RESPONSES TO DISCONTINUOUS CHANGE

ALAN D. MEYER, GEOFFREY R. BROOKS, and JAMES B. GOES
Graduate School of Management, University of Oregon, Eugene, Oregon, U.S.A.

The organizational change literature contains diverse characterizations of change processes with contradictory implications for strategic managers. Many inconsistencies are resolved by classifying models of organizational change according to the primary mode of change (continuous or discontinuous) and the primary level at which change occurs (organization or industry) to yield four basic types of change: adaptation, metamorphosis, evolution, and revolution. These types influence organizations' adaptive responses, shape industries' competitive structures, and constrain researchers' methods of inquiry. This paper identifies a gap in the literature: theory and research focusing on discontinuous changes occurring at the industry level of analysis. A perspective on this type of change is developed, and applied in a historical analysis of the hospital industry. Data from a longitudinal field study are used to illustrate various organizational responses to discontinuities.

The history of life contains long periods of boredom and short periods of terror (Stephen Jay Gould)

From time to time, organizational environments undergo cataclysmic upheavals—changes so sudden and extensive that they alter the trajectories of entire industries, overwhelm the adaptive capacities of resilient organizations, and surpass the comprehension of seasoned managers. Industries currently in the throes of quantum change include telecommunications, financial services, airline transportation, and health care. In each of these settings, discontinuous changes are restructuring the industry, relocating its boundaries, and changing the bases of competition. As the pace of technological, socioeconomic and regulatory change accelerates, organizations' survival depends increasingly on devising entrepreneurial responses to unforeseen discontinuities (Huber, 1984). But to executives and industry experts alike, the scope and magnitude of

change often seem unprecedented and nearly incomprehensible.

Strategic management theory and research offer little guidance to managers facing these conditions. Although sizable literatures have accumulated in the areas of organizational strategy, design, and change, they include no theories explaining the causes and processes of quantum changes enveloping entire industries. One reason is that industries in flux normally make unappealing research settings. Like earthquake victims, researchers are inclined to run for cover, wait for the dust to settle, and then return cautiously to search through the debris.

This paper focuses on organizations' responses to discontinuous changes. It grows out of our ongoing longitudinal study of medical-surgical hospitals' strategic responses to changes occurring in the health care industry (Meyer, Brooks, and Goes, 1989). The study was designed as a field experiment that would capitalize on naturally occurring environmental change to relate differences in organizations' responses to differences

0143-2095/90/050093-18\$09.00
© 1990 by John Wiley & Sons, Ltd.

in their subsequent performances.¹ However, the research team failed to anticipate the nature or the intensity of change they would encounter. The first signs of this materialized during the 6-week period immediately preceding the first wave of field interviews, when two of the 30 hospitals in the sample merged, three were acquired, and seven CEO successions occurred. As the researchers proceeded to conduct structured interviews with the surviving CEOs, it soon became apparent that the study's theoretical framework, which treated strategic adaptations as equilibrium-seeking responses by organizations (Meyer, 1982), could not encompass the environmental changes in progress or account for the organizational responses being observed. Simply stated, while discontinuous changes are overturning the existing industry order, there is no equilibrium to be sought.

It was clear that a new theoretical framework was needed in order to analyze and interpret the data being collected. Thus, the most pressing research objective became the development of a broader framework for conceptualizing organizational change. This paper presents the result of that effort. In the first section a framework is offered for classifying available theoretical perspectives on change within organizations and industries. Finding a gap in the literature—models focusing on discontinuous changes at the industry level of analysis—the second section draws on theoretical work in biology (Gould, 1977), economics (Schumpeter, 1950), and organizational science (Miller and Friesen, 1984; Tushman and Romanelli, 1985), to synthesize a perspective on industry-wide quantum change. The third section applies the framework in a historical analysis of the health care industry, showing how discontinuous changes have redefined the competitive landscape. Finally, the paper draws on the author's continuing field study to illustrate the variety and dynamics of organizations' responses to discontinuities, and it notes implications for managers and researchers.

¹ The study is ongoing, with a new wave of interview data being collected every 6 months from CEOs and/or COOs of 30 hospitals, supplemented with questionnaire data, archival data, and interviews with industry experts. It is part of a larger multi-investigator program of research (Glick and Huber, 1989). Methodological details are available in Meyer (1985).

CLASSIFYING THEORIES OF ORGANIZATIONAL CHANGE

The organizational change literature characterizes change processes in diverse ways. Change is portrayed both as a continuous organizational process (March, 1981) and as brief episodes interspersed between long periods of stability and inertia (Miller and Friesen, 1984). Some writers focus on changes as volitional managerial actions (Andrews, 1971), while others conceive of changes as results of unforeseen exogenous shocks (Meyer, 1982). Many such inconsistencies arise from different assumptions, often implicit, about the fundamental nature of change and the principal level at which it occurs.

Modes of change

Almost everyone who spends much time thinking about change processes seems to conclude that the world changes in two fundamentally different modes (Watzlawick, Weakland, and Fisch, 1974). Continuous, or first-order change, occurs within a stable system that itself remains unchanged. Indeed, system stability often *requires* frequent first-order change, such as the myriad of small compensatory steering movements that permit a bicyclist to maintain his or her equilibrium. Discontinuous, or second-order change transforms fundamental properties or states of the system. The distinction between first- and second-order change has been likened to that between simple motion and acceleration (Watzlawick *et al.*, 1974). Some compelling examples of social systems plunging from first-order to second-order change are afforded by the sociopolitical upheavals in eastern Europe in late 1989.

The concepts of first- and second-order change have been plied in virtually every unit of analysis examined by organizational scientists: single- vs. double-loop learning by individuals (Argyris and Schön, 1979), variations vs. reorientations in products (Normann, 1971), adaptation vs. metamorphosis by organizations (Miller and Friesen, 1984), competence-enhancing vs. competence-destroying changes in technology (Tushman and Anderson, 1986), and evolution vs. revolution in industries (Schumpeter, 1950).

Within the field of strategic management, however, first-order change has received considerably more attention than second-order change (Starbuck, 1985; Zammuto and Cameron, 1985).

Ginsberg (1988) recently used the notions of first- and second-order change in reviewing the literature on changes in organizational strategy. Much of this literature emphasizes gradual, first-order environmental change, and exhorts strategists to respond by engaging in planning, forecasting, and other first-order organizational changes.

Levels of analysis

The level at which change is assumed to occur provides a second dimension for classifying theories about organizational change (Astley and Van de Ven, 1983). Traditionally, strategy theorists have taken the firm as the relevant unit of analysis and focused on actions designed to change organizational attributes to match environmental conditions (Ansoff, 1965; Andrews, 1971; Hofer and Schendel, 1978). More recently, concepts fashioned at the level of industries, populations, or groups of competing organizations have been introduced.² Astley and Fombrun (1983) proposed the notion of collective strategy, and Bresser (1988) investigated the dilemmas that collective strategies pose regarding disclosure of proprietary information. Fennell and Alexander (1987) used an institutional theory perspective to examine interorganizational bridging strategies, others have examined strategic implications of interlocking directorates (Zajac, 1988) and interorganizational networks (Thorelli, 1986; Jarillo, 1988). Work grounded in the structure–conduct–performance paradigm (Scherer, 1980) has considered the effects of industry structure, mobility barriers, and strategic groups (Hunt, 1972; Caves and Porter, 1977; Porter, 1980). Nevertheless, as noted by McGee and Thomas (1986), after newly introduced industry-level concepts became assimilated by strategic management theory, the level of analysis tends to revert from the industry back to the firm.

² As McKelvey (1982) argues, the locus of an organizational population's boundaries depends on both conceptual and empirical issues (e.g. the particular research question being addressed, and the specific organizations being investigated). For the purposes of our general discussion, the terms population and industry will be used interchangeably to refer to a relevant set of competing organizations.

Conceptual framework

The distinctions drawn above between mode of change (first- vs. second-order), and level of change (firm vs. industry), are used in Figure 1 to classify theories about how firms maintain alignments with their environments.³ The figure's northwest quadrant corresponds to theories of first-order change constructed at the organization level of analysis. These are termed *adaptation* theories,⁴ and they maintain that firms track their environments more or less continuously and adjust to them purposively. Two mechanisms of adjustment have been proposed. Theorists espousing an 'incrementalist' approach (e.g. Quinn, 1978; Miles and Snow, 1978; Mintzberg and McHugh, 1985) maintain that strategists experiment with new products, structures, and processes. Successful variations are institutionalized in firms' structural designs and product-market domains. An alternate mechanism of organizational adaptation is proposed by the resource dependence model (Pfeffer and Salancik, 1979). Here, strategic managers are relegated to a lesser role since organizational changes are viewed as responses dictated by external dependencies. Nevertheless, the organization remains the principal unit within which change is seen as occurring, and first-order change is the principal mode emphasized in resource dependence theory. Whichever approach is taken, the domain of theoretical explanation is limited to incremental changes within firms. Other events are exogenous to adaptation models. Adaptation models posit firm-level processes that construct idiosyncratic product-market domains, and thus increase inter-organizational diversity over time.

In the figure's southwest quadrant are models addressing how industries, or populations of competing firms, undergo first-order change. We refer to these as *evolution* models, because they maintain that although individual firms are

³ The classification of works into particular categories is not intended to suggest that the authors possess narrow or rigid points of view. Many of those referenced have acknowledged other forms of change than those indicated in Figure 1, or adopted broader perspectives in other works.

⁴ The term 'adaptation' assumes a variety of connotations in the literature, ranging from simply 'change' (Hrebiniak and Joyce, 1985), to the more limited denotation of 'response' to environmental forces or events (Meyer, 1982). In this paper we use the term in reference to both 'proactive' and 'reactive' managerial actions (Miles and Snow, 1978) taken to align the organization with its environment.

		First-Order Change	Second-Order Change
Firm Level		Adaptation	Metamorphosis
		<p>Focus: Incremental change within organizations</p> <p>Mechanisms: • Incrementalism • Resource dependence</p> <p>Authors: Lindblom (1959) Miles & Snow (1978) Pfeffer & Salancik (1978) Quinn (1978)</p>	<p>Focus: Frame-breaking change within organizations</p> <p>Mechanisms: • Life cycle stages • Configuration transitions</p> <p>Authors: Ginsberg (1988) Greiner (1972) Kimberly & Miles (1980) Miller & Friesen (1984) Tushman & Romanelli (1985)</p>
Industry Level		Evolution	Revolution
		<p>Focus: Incremental change within established industries</p> <p>Mechanisms: • Natural selection • Institutional isomorphism</p> <p>Authors: Hannan & Freeman (1977) McKelvey & Aldrich (1983) DiMaggio & Powell (1983) Scott (1987) Zucker (1987)</p>	<p>Focus: Emergence, transformation, and decline of industries</p> <p>Mechanisms: • Punctuated equilibrium • Quantum speciation</p> <p>Authors: Astley (1985) Barney (1986) Gould & Eldredge (1977) Schumpeter (1950)</p>

Figure 1. Models of change within organizations and industries

relatively inert, various forces propel populations of firms toward alignment with prevailing external conditions. Two streams of evolutionary theory are differentiated by the dominant change mechanisms they posit. Population ecologists (e.g. Hannan and Freeman, 1977, 1984; McKelvey, 1982) emphasize blind variation, selection, and retention. They maintain that differential rates in the entry and exit of firms cause populations to evolve gradually to fit the technical and economic constraints of environmental niches. Alternatively, institutional theorists (e.g. Meyer and Rowan, 1977; Scott, 1987; Zucker, 1987) argue that organizations experience pressure to conform to the normative expectations of their institutional environments. Achieving 'isomorphism' with such expectations allows organizations to gain legitimacy, garner resources, and enhance their chances of surviving. Whereas population ecology theory assumes that competition for resources shapes populations by affect-

ing entry and exit rates, institutional theory emphasizes competition for legitimacy and entertains the possibility of change within existing organizations. But although they emphasize different causal mechanisms, ecological and institutional approaches to evolution both postulate population-level processes that increase the homogeneity of firms over time.

The northeast quadrant of Figure 1 contains firm-level theories focusing on second-order changes. These are termed *metamorphosis* theories, because they maintain that organizations adopt stable configurations and possess inertia, but must periodically realign by undergoing rapid, organization-wide transformations. Theorists have proposed various causal mechanisms that might drive metamorphic changes. These include progression through life cycle stages (Kimberly and Miles, 1989), shifts between strategic types (Miles and Snow, 1979), changes in structural gestalts (Miller and Friesen, 1984), and techno-

logical breakthroughs (Tushman and Romanelli, 1985). In any case, metamorphosis theories focus on frame-breaking changes confined within the boundaries of single firms.

Finally, the figure's southeast quadrant is reserved for theories focusing on second-order change in industries. Following Schumpeter (1950), we label these *revolution* models, because they propose that industries are restructured and reconstituted during brief periods of quantum change, which punctuate long periods of stability. Quantum speciation, a biological notion, has been proposed as a mechanism whereby new organizational forms might emerge during such periods (Astley, 1985).

As mentioned above, strategy theorists have rarely ventured into this quadrant. Although our literature review located several conceptual essays, no fully developed theories or systematic empirical observations were found. Metamorphosis theorists argue that progression between developmental stages (Kimberly and Miles, 1980) or radical innovations in technology (Tushman and Romanelli, 1985) lead to second-order changes *within* organizations—but they have not addressed the issue of why or how second-order changes in the structure of an industry itself unfold. Van de Ven and Garud (1987) explain the emergence of new industries, but their framework is less germane to second-order changes that restructure existing industries. Barney (1986) discusses industry-wide Schumpeterian shocks, but he does not delineate their dynamics. Population ecologists (Hannan and Freeman, 1984) describe how collections of competing firms evolve, yet they have little to say about how exogenous second-order changes redefine viable niches, or trigger the emergence of new organizational forms (Astley, 1985; Carroll, 1984).⁵ Institutional theorists argue that coercive,

mimetic, and normative forces bring organizations into alignment with each other and with the institutions upon which they depend (DiMaggio and Powell, 1983), but the processes whereby institutions form and re-form have not been considered (Barley and Tolbert, 1988).

Conceptually, Figure 1 organizes the literature according to implicit and explicit assumptions about the nature and level of change. Four types of change are distinguished, and one is highlighted—discontinuous industry-level change—that has been neglected by the strategic management field. Of course adaptation, metamorphosis, evolution, and revolution are not independent and mutually exclusive forms of change. That is, change processes associated with different quadrants in Figure 1 may occur simultaneously, and the incidence or intensity of change in one quadrant may influence the incidence or intensity of change in another. A group of competing firms, for example, each seeking to adapt within the same domain by cultivating unique competencies (first-order firm-level changes), may simultaneously experience institutional pressure to display identical structural features (first-order industry-level change). The interplay of adaptive and evolutionary change will, over time, determine whether this particular group of firms becomes more heterogeneous or more homogeneous.

Empirically, the types of change summarized in Figure 1 may help isolate and interpret the multi-level processes that alter organizations and industries over time. In the paper's next section we apply the framework to the hospital industry, the volatile research setting that provoked its development. The discussion focuses on the predominant types of change in the industry across three decades, and it invokes each of the four perspectives depicted in Figure 1.

THE HOSPITAL INDUSTRY: A HISTORICAL ANALYSIS

An industry, like any other social system, may be profitably viewed as a dynamic entity with a past, a present, and a future (Pettigrew, 1979). This section of the paper offers a brief historical case study set in a single industry. It focuses on medical-surgical hospitals in four counties

⁵ Although the population-level analyses conducted by Hannan and Freeman have attracted by far the largest share of attention, it should be noted that the population is but one of several possible levels in the ecological analysis of organizations (Carroll, 1984; Astley and Fombrun, 1983; Astley, 1985). Carroll (1984) terms this larger domain 'organizational ecology' and argues that it includes analyses conducted at a lower level focusing on developmental changes within individual organizations ('organizational demography') as well as analyses conducted at a higher level focusing on interactions between multiple populations ('community ecology'). Nevertheless, empirical studies are few and second-order changes remain exogenous events.

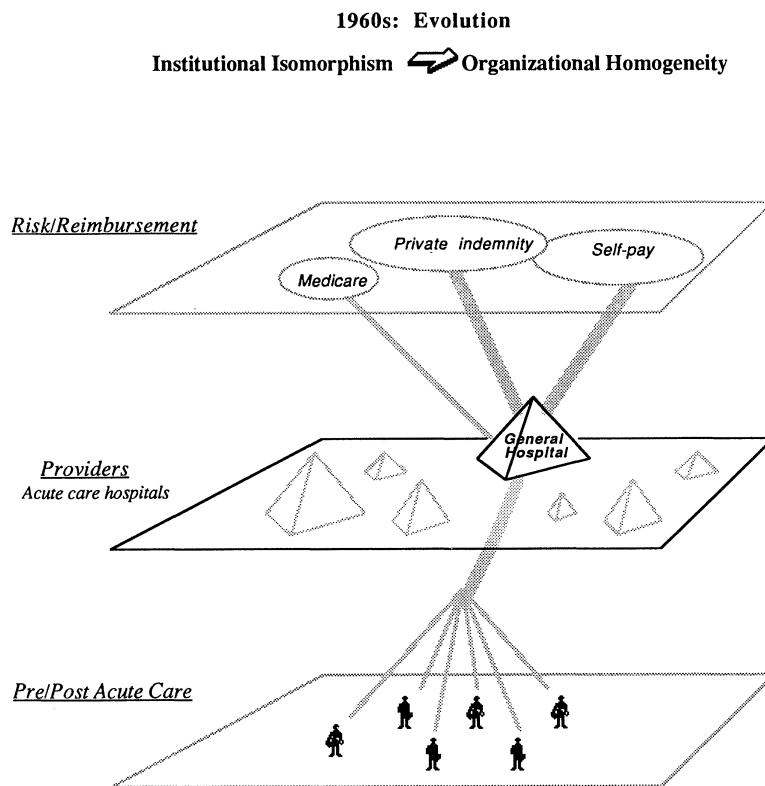


Figure 2. 1960s: Evolution

contiguous to San Francisco Bay.⁶ The analysis draws upon a data set assembled over a 16-year period using a variety of methods: structured interviews with industry experts and hospital CEOs, naturalistic observations, responses to mailed surveys, inspection of organizational documents, and analysis of secondary data.⁷

An analysis of the hospital industry must take into account three distinct, but highly interdependent, sectors of health care: (1) the provider sector wherein hospitals actually deliver acute care, (2) the risk/reimbursement sector that

insures and pays for such care, and (3) the pre/post-acute sector that funnels patients into hospitals and provides care after their discharge. In Figures 2–4 these three sectors are depicted as parallel planes. For purposes of illustration the diagrams depict the position of 'General Hospital,' a typical provider in the industry, during each of three decades.

The 1960s: evolution via institutional isomorphism

For the hospitals inhabiting the San Francisco area, the 1960s was a period when institutional forces engendered a remarkable degree of inter-organizational homogeneity. Medical professionals dominated hospital power structures (Perrow, 1965), and imposed what institutional theorists term normative isomorphism (DiMaggio and

⁶ The number of medical-surgical hospitals within the four counties area ranged from 45 to 57 during the time period of this analysis. Due to the local character of markets for acute health care services, this population affords a reasonable representation of the industry.

⁷ For methodological details, see Miles and Snow (1978: 214–245), Meyer (1982, 1985), and Glick and Huber (1989).

1970s: Adaptation
 Organizational Adaptation ⇌ Industry Heterogeneity

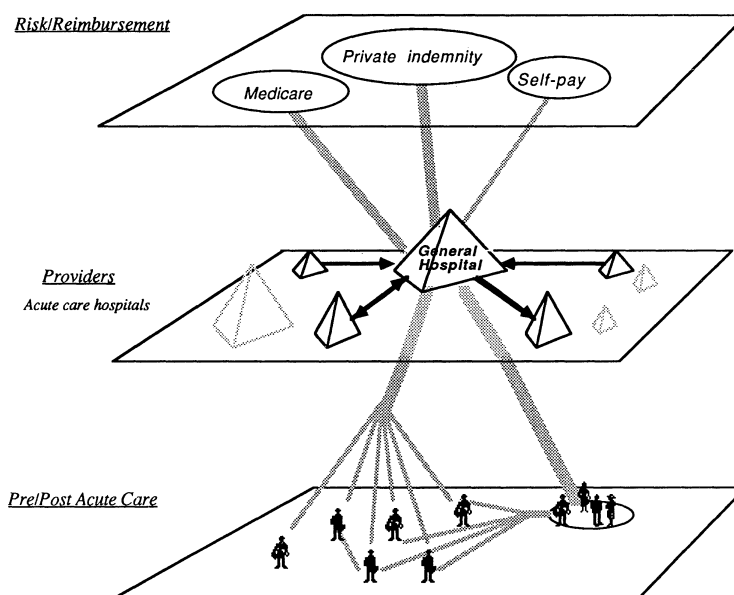


Figure 3. 1970s: Adaptation

Powell, 1983). At the same time, governmental regulation and largesse created pressures for coercive isomorphism.

Most hospital administrators of this era believed that strategic planning involved only writing a mission statement and commissioning an architect to draw up blueprints for a new wing (Meyer, 1978). Serious attempts by hospitals to differentiate their services or segment their markets were virtually non-existent. The absence of strong competition for resources rendered such efforts unnecessary and intense institutional pressures for conformity rendered them ill-advised. Any gains in market share won through adaptive change were likely to be offset by losses in legitimacy. Accordingly, hospitals' goals, structures, and missions resembled closely those of their competitors, and CEOs perceived their environments as relatively tranquil and munifi-

cent. Metamorphic changes were rare, as hospitals grew incrementally by adding services in a well-established sequence (Edwards, Miller and Schumacher, 1972). Conditions were predictable and competition was orderly. Interorganizational linkages to other hospitals were largely unnecessary. Links up to the risk/reimbursement sector and down to the pre/post acute care sector were straightforward.

In economists' terminology the hospitals were regulated, homogeneous oligopolists during the 1960s. Industry boundaries were distinct, entry barriers were high, and competition was negligible. In terms of our framework, this was an era of evolution: industry-level first-order change was the primary change process operating, the most potent mechanisms of change were institutional, and the result was homogenization of the industry.

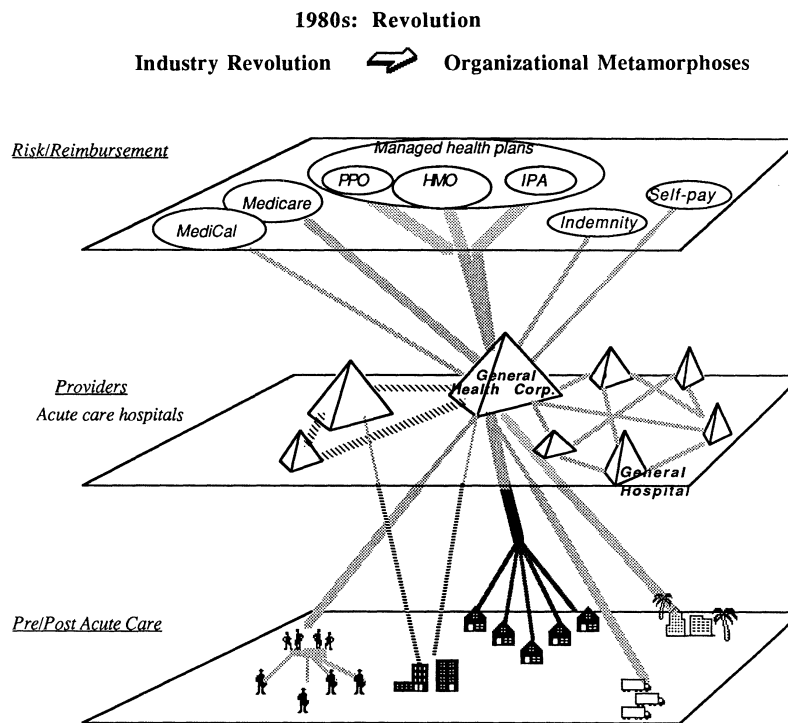


Figure 4. 1980s: Revolution

Proposition 1: Over time, an industry's evolutionary changes tend to increase the homogeneity of firms within the industry.

The 1970s: organizational adaptation

In the decade that followed, adaptation replaced evolution as the dominant form of change, strategic and structural differentiation occurred, and the level of diversity within the industry increased. As new technologies such as CT scanners, kidney dialysis, and intensive care units came on line, hospital costs rose, resource scarcities emerged, and regulatory actions were triggered. Competition for patients increased, and newly imposed regulatory reviews of facility expansions and equipment purchases fomented political skirmishing. Hospitals grew to appreciate the concept of competitive strategy, and some hired consultants to identify their distinctive competence. By the mid-1970s, industry experts were able to easily classify most hospitals

competing in the Bay Area according to generic strategy (Miles and Snow, 1978). Competition, however, turned on non-price factors, since roughly 80 percent of reimbursements were made on a cost-plus basis. Moving to the pre/post acute care sector at the bottom of the figure, fee-for-service medicine was fragmenting as specialties multiplied and group practices proliferated. Thus, both normative and coercive forces for isomorphism among providers were dwindling.

In the language of our framework, the 1970s was primarily a decade of adaptation. First-order change at the firm level became the predominant mode of change, driven both by resource dependence and purposive incremental change. Executives luxuriated in a sense of professional progress and mastery of the environment. Hospital administration was emerging as a bona-fide profession with established educational institutions and recognized credentialing mechanisms. The industry environment was changing, but in ways that appeared comprehensible. Interorganizational

diversity was increasing as many hospitals settled into distinctive strategic configurations. However, unseen stresses were accumulating, and the industry was drifting toward a period of rapid restructuring.

Proposition 2: Over time, adaptive changes undertaken by individual firms increase the collective diversity of firms within an industry.

The 1980s: industry revolution

Second-order changes swept through the hospital industry during the 1980s (Zajac and Shortell, 1989). An early byproduct of this industry revolution was a burst of metamorphic change within organizations. During the first half of the decade most freestanding hospitals in the Bay Area underwent a corporate reorganization. The chief impetus for their metamorphoses was resource scarcity, and the chief objective was to expedite diversification strategies. For instance, as shown in Figure 4, General Hospital metamorphosed into General Health Corporation, a regional holding company that owned one hospital outright and was formally affiliated with four others. As indicated at the bottom of the diagram, General diversified into a number of pre- and post-acute care products and services. Some, including a string of five urgent-care centers and several upscale residential nursing homes, probably qualify as vertical diversifications. Other projects are best viewed as related diversifications, like a joint venture with another hospital to acquire a wheel-chair manufacturer. Still other diversifications—like the purchase of a local trucking business—are clearly unrelated.

But although the aforementioned changes are substantial, the changes occurring in the risk/reimbursement sector overshadow them. As shown in Figure 4, the health insurance market has fragmented, largely due to explosive growth in 'managed health plans.'⁸ Initially, hospitals were so reluctant to turn away business that some contracted simultaneously with as many as 90 different plans, often at discounts exceeding 30 percent. These contract negotiations, as well

⁸ These include 'discount plans' like PPOs, where brokers bundle consumers of health care into groups and negotiate reduced rates with individual hospitals; and 'capitated plans' like HMOs where providers assume the insurance function by being at risk for all costs that exceed predetermined rates.

as the preparation of sealed bids for MediCal contract awards, took place in the absence of sound actuarial data about the incidence of different types of diagnoses within the population, and without reliable internal data on the cost to the hospital of providing necessary services. As the contract share of volume increased, hospitals suddenly found themselves holding considerable risk.

The 1980s has emerged as a decade of revolution in health care. Discontinuous changes are restructuring and reconstituting the industry. Long-established barriers partitioning health care into the medical-surgical sector, the risk/reimbursement sector, and the pre/post acute care sector have been breached. Hospitals are being thrust into the insurance business and insurance carriers are building and buying medical clinics. In their offices, doctors are competing directly with the hospitals with which they are affiliated to perform outpatient procedures, to control diagnostic imaging, and to provide other lucrative ancillary services. Revolution in the industry is cascading down to the firm level, inducing organizational metamorphoses and stimulating CEOs' efforts to adapt. However, many of their adaptive responses are tentative, and the consequences are often impossible to assess. CEOs report feeling confused and impotent. Many admit that they have lost control of their organizations in all but a tactical sense. To treat this industry simply as one where heightened competition is eliciting strategic responses would be a mistake, and to view these changes only from an organizational perspective would ignore the fundamental restructuring that is going on within and between industries.

Proposition 3: Revolutionary changes within an industry trigger adaptive and metamorphic changes within firms.

In sum, changes occurring within the hospital industry during the past three decades may be characterized as evolution of a population of firms, giving way to adaptation within individual firms, followed by industry-wide revolution. The ability of the proposed model to characterize the temporal ebb and flow of change processes across two levels of analysis is encouraging. However, as Alice remarked to the Red Queen, 'naming something isn't the same as explaining it.' To

advance the model from description toward explanation would entail identifying the forces linking changes at different levels of analysis, and specifying mechanisms triggering shifts between first- and second-order change. Some preliminary steps toward this objective are taken in the next section, where we draw on interview and observational data to illustrate the dynamics of second-order change within hospitals.

ORGANIZATIONAL RESPONSES TO DISCONTINUOUS CHANGE: ADAPTATION, METAMORPHOSIS, AND SPECIATION

Organizations exposed to discontinuous changes emit varied responses. Some of this variance can be attributed to differences between the organizations, and some can be attributed to

differences between the changes. One key attribute of discontinuous change had to do with the degree of permanence. In particular, transient discontinuities, or environmental jolts, may elicit different responses from organizations than do discontinuities which suddenly impose permanent shifts in environmental states (Meyer, 1982).

An environmental jolt

On 1 May 1975, hospitals in San Francisco were jolted by a strike by anesthesiologists. Most surgeons and referral physicians supported the strike, so elective surgery was curtailed immediately. As occupancy rates fell and cash flows dwindled, observers predicted that hospital bankruptcies were imminent. The strike was unprecedented, it affected all hospitals simultaneously, and it lasted 30 days. Table 1 outlines three hospitals' diverse, but nonetheless effective, responses.

Table 1. Organizations' responses to an environmental jolt

Antecedents	Memorial Hospital	Community Hospital	Pacific Hospital
Strategic type	Defender (stable market niches)	Prospector (volatile market niches)	Reactor (incoherent market domain)
Organizational form	Functional	Product	Functional
Ideology Metaphor Shared values	Lean and Hungry Efficiency, predictability, self-reliance	Entrepreneurial mob Innovation, pluralism, professional autonomy	Physicians' workshop Harmony, paternalism
Slack resources			
Financial	Large reserves	Small reserves	Small reserves
Human	Understaffed	Overstaffed	Overstaffed
Technology	Small investment	Large investment	Small investment
Control	Small investment	Small investment	Small investment
Strike responses	Adaptation	Adaptation	Metamorphosis
Strategy	Weather the storm	Experiment and learn	Transform the hospital
Tactics	Adapt to jolt by consuming financial reserves. Announce no-layoff policy. Enlist tacit cooperation of physicians. Protect implicit modes of control and members' commitment	Adapt to jolt by reducing staffing. Develop contingency plans. Centralize power temporarily. Exploit subunits' autonomy, middle managers' expertise, and members' tolerance of change. Protect minimal capital reserves	Magnify jolt by warning bankruptcy is imminent. Justify extensive layoffs, abrogation of labor agreements, and program closures as last-gasp survival measures. Emerge from strike with a Defender strategy

Some hospitals adapted to the strike by depleting caches of slack resources. Memorial Hospital, for instance, had accumulated sizable financial reserves by competing as a cost-efficient defender (Miles and Snow, 1978). However, the price of continuing to pursue this generic strategy throughout the strike might have been prohibitive. Instead, top managers opted to 'weather the storm' by temporarily transforming Memorial into an efficient, overstaffed, and unprofitable organization. Community Hospital, on the other hand, adapted by undergoing just the opposite transformation. Community had invested slack in medical technology and human resources in order to compete as an innovative prospector firm. But when the strike began the hospital was swiftly converted to a stripped-down, cost-conscious, precisely coordinated organization. Community's CEO subsequently described the strike as 'a good experiment,' and the hospital's response as 'a valuable learning experience.'

When an organization is jolted away from equilibrium, the rules of the game can change radically. The responses of Memorial and Community underscore the paradoxical relationship between first- and second-order change. By temporarily becoming its own antithesis (a definite, albeit momentary second-order change) each of these two hospitals emerged from the strike with its original strategy/structure configuration not only intact, but better aligned with the hospital's external domain (an instance of first-order adaptation). The lesson, it seems, is that surprises can invert virtues and vices.

Proposition 4: Engaging in temporary metamorphic change is a viable strategy for adapting to transitory environmental jolts.

But in other cases, metamorphic organizational changes triggered by the strike persisted. Industry experts initially classified Pacific Hospital's generic strategy as that of a reactor (Miles and Snow, 1978), they judged the organization on the verge of bankruptcy, and they predicted that it would be the first organizational casualty of the physicians' strike. Instead, Pacific's CEO seized the opportunity afforded by the strike to implement change. 'By pushing us to the edge of the precipice,' he said, 'the strike provided the leverage we needed to cut costs.' Pacific closed a half-dozen money-losing programs per-

manently, abrogated labor contracts, instituted large-scale layoffs, and rehired selectively when the strike ended. 'We came out of the strike,' he said, 'in far better shape than we went in.' In fact, Pacific underwent a strategic metamorphosis. In the aftermath of the strike, industry experts reclassified Pacific's strategy as that of a defender.

Proposition 5: Environmental jolts provoke crises that facilitate organizational metamorphoses.

Changes such as these are difficult to comprehend until a second-order change model is adopted. They are better understood as transitions between configurations (Miller and Friesen, 1984) than as adaptive responses. In terms of Figure 1, adaptation models afford inadequate frameworks for understanding metamorphic changes within firms. In any case, with the strike behind them, San Francisco hospitals resumed the far more pleasant chore of adapting to incremental environmental change. The halcyon days for hospital executives had apparently returned—but they did not last.

Punctuated equilibrium

Gould and Eldredge (1977) have characterized punctuated equilibria as changes that occur in large leaps. These changes follow a gradual accumulation of stress, which a system resists until it reaches its breaking point, or until a triggering event precipitates discontinuous change. As California hospitals entered the 1980s, three stresses had been accumulating for some time. The first resulted from spectacular growth in 'managed care,' a term encompassing health maintenance organizations (HMOs), preferred provider organizations (PPOs), and other new vehicles for financing and delivering health services.⁹ Second, a hospital building boom fueled by federal largesse during the 1960s and 1970s had saddled the industry with substantial excess capacity.¹⁰ Third, entry and mobility barriers

⁹ Between 1983 and 1987, the HMO share of the California market rose from less than 15 percent to over 30 percent; during the same years, PPO enrollment increased from less than 300,000 members to over 12,000,000 (*California Hospitals*, March 1987).

¹⁰ A standard index of capacity utilization is the ratio of fixed assets to patient days. Between 1977 and 1987 this ratio increased by 56 percent.

had been undermined by competence-destroying innovations in medical technologies and services.¹¹ Characteristically, industry participants resisted change, and the stresses continued to build.

However, in 1982 and 1983 state and federal governments launched a fusillade of regulatory actions in an attempt to contain health costs by increasing competition. The most important actions were: (1) initiating sealed-bid contracting for state-subsidized low-income patients, which imposed unprecedented incentives for operating efficiently and required hospitals to hold considerable risk; (2) sunseting the Certificate of Need review process, which removed a major regulatory barrier to entry and mobility within the industry; and (3) shifting the Medicare reimbursement system to diagnostic related groups (DRGs), and levying nationwide rates that had especially harsh effects in high-cost locales like San Francisco. In and of themselves, these regulatory actions appeared relatively innocuous. But small causes can have large effects—the outcome was discontinuous change that surged through the hospital industry in California.

Proposition 6: Weak forces can trigger revolutionary change by releasing the accumulated pressure of prior technological, social, and political changes.

Responding to revolution

In July 1987 the authors began the longitudinal study of hospitals that gave rise to this paper. We have now conducted four waves of field interviews, at 6-month intervals, with CEOs struggling to interpret and react to the discontinuous changes unfolding in the industry. Table 2 summarizes their strategic responses.

In hospitals' executive suites, profound shifts were observed in CEOs' activities, emotional states, and in the issues commanding their attention. The mood has swung from optimism, through despair, to resignation; foci of attention have changed from primarily external to primarily internal; and the central activities have shifted

from strategy formulation, to implementation, and most recently to downsizing and retrenchment.

In the risk/reimbursement sector, traditional indemnity insurance has almost disappeared during the 2-year period, while hospital executives' postures toward management care—HMOs, PPOs, and so forth—have ricocheted from optimism, to disenchantment, to determination to build equity positions in managed care plans. The financial naivete and 'promiscuous contracting' that characterized the beginning of the period have been replaced by tougher negotiation and a clearer understanding of hospital cost structures.

Early-1980s diversification into pre/post acute care products and services has given way to divestment, and recently to disaggregation. Nearly all hospitals that invested in primary care clinics or acquired unrelated businesses have absorbed losses. Fierce competition for diagnostic imaging, laboratory, and other profitable ancillary services is coming from physicians and external entrepreneurs. Frequently, to avoid ceding the services to unaffiliated investors outright, hospitals spin them off in joint ventures with physicians from their own medical staff. The result, in either case, is a hollowing-out of the hospital.

One intriguing trend that characterizes the hospital industry during this 2-year period is a pronounced shift away from competition among free-standing hospitals toward affiliation into overlapping provider networks. These local networks have crystallized rapidly, and they constitute entrepreneurial responses to the second-order change occurring in the industry.¹²

Proposition 7: Revolutionary change within an industry stimulates the formation of interorganizational relationships.

Quantum speciation

In biology, Gould (1977) maintains that new species are most likely to arise when a small segment of an ancestral population is isolated at the periphery of the ecological domain. Here,

¹¹ Advances in outpatient surgery, for instance, lower barriers between acute care, primary care, and group medical practice; ultra-expensive diagnostic and treatment technologies such as magnetic resonance imaging or mobile lithotripsy allow non-medical entrepreneurs to enter medical services markets.

¹² The national and regional multihospital systems that proliferated during the 1970s (Wegmiller, 1985) have failed to provide the network benefits they promised, largely because the natural markets for health care are local (Goes, 1988).

Table 2. Hospitals' strategic responses to an industry revolution¹

Wave 1 (July 1987)	Wave 2 (January 1988)	Wave 3 (July 1988)	Wave 4 (January 1989)
<p><i>In the executive suite</i> Great emphasis on formulating competitive strategies; less on implementation. Little change in organization structure. Adequate financial performance, good volume are typical. Mood is decidedly upbeat.</p>	<p>Strategy implementation now under way. Many structural reorganizations are in progress. Performance: generally high occupancy, but dwindling medicare reimbursement is troubling. Mood grows increasingly somber.</p>	<p>Many CEO successions, downsizing TMTs, adopting internal focus. Skim and differentiation strategies abandoned. Performance: mounting financial losses. Mood is to cut losses and weather storm. Gloom and doom abound.</p>	<p>Retrenching to core businesses. Downsizing continues at top and middle management levels. Performance: losses in competitive markets, profits in protected markets. Mood of realization that industry changes are irreversible, permanent.</p>
<p><i>Risk/reimbursement interface</i> General optimism about managed care, coupled with fear of turning away business. Tempered by concerns about magnitude of discounting and ignorance about costs of providing services.</p>	<p>Disenchantment with managed care and renegotiation of contracts. More awareness of costs of providing services and overhead costs of low-volume contracts. Curtailment of 'promiscuous contracting.'</p>	<p>HMOs experience heavy losses, levy sizable premium increases. Indemnity insurance vanishing. Hospitals are now more experienced and selective in negotiating with managed care contractors.</p>	<p>Competition increasingly revolves around managed care. New products being developed and marketed. Many hospital CEOs seek to supplement arms-length contracting with equity in HMOs to retain control.</p>
<p><i>Pre/post acute care interface</i> Diversification into pre- and post-acute care continues, but a retreat from primary care clinics is apparent. Concerted efforts to foster a bottom-line orientation among M.D.s via education and indoctrination.</p>	<p>Back to basics sentiment surfaces. Divestiture of unrelated and many related businesses is now well under way. Hospital executives are devoting more attention to romancing and recruiting physicians to boost patient occupancy.</p>	<p>Divestment continues. Conviction grows that diversification does not make sense in this industry. More vigorous physician recruitment by offering equity in joint ventures and subsidized medical office space as inducements.</p>	<p>Divestment gives way to disaggregation as core technologies are siphoned off or spun off. Joint ventures lead to hollowing out of the hospital. JVs now essential for physician retention as well as recruitment.</p>
<p><i>Network affiliation</i> Strong enthusiasm: 80 percent of local hospitals are either affiliated or actively courting network partners. Main benefit anticipated is area-wide contracting for managed care. 10 percent opting to retain autonomy.</p>	<p>Marked decline in enthusiasm. Tendency to opt for either full merger or freestanding posture; avoid intermediate positions. Main benefit perceived now is better access to financing.</p>	<p>An unprecedented number of acquisitions, affiliations, and mergers have just been completed, or are under way. Key motive now is survival.</p>	<p>No major new affiliations since July, but many deals hang in abeyance. Air of expectation: extensive and durable groupings may jell at any time. Sitting in limbo.</p>

¹ Based on content analysis of transcripts obtained during four waves of structured interviews with CEOs and/or COOs of 30 medical-surgical hospitals in the San Francisco Bay Area.

conditions are harsh and selection pressures intense, because peripheries mark the edge of ecological tolerance for the form. In these settings, favorable mutations spread quickly, and can become more easily established. In this manner 'new populations diverge to coexist alongside their ancestors until the latter are suddenly extinguished' (Astley, 1985; 230).

The 52 hospitals clustered around the shores of San Francisco Bay inhabit an ecological niche that is isolated from other hospital organizations in geographic, demographic, and regulatory terms. As competition intensified in the early 1980s, several regional networks like the one depicted in Figure 4 for General Hospital appeared in this organizational population. These new interorganizational structures did not evolve in any gradual fashion. They did not, for instance, arise from the formalization of emergent social networks, the accretion of historical exchange patterns, or the crystallization of dependency relationships (although all of these linkages are present).

Proposition 8: Revolutionary change within an industry promotes experimentation with new organizational forms.

Rather, our first wave of field interviews indicated that these networks are analogous to biological mutations. They were brokered purposively by entrepreneurs to create new competitive vehicles for financing and delivering health care (Goes, 1988). They connect components of organizations that were formerly independent by imposing governance structures ranging from markets to hierarchies. The linkages joining them form multiple layers of informal alliances, year-to-year contracts, joint ventures, and interlocking equity holdings. Hospitals connected by collaborative linkages for specified undertakings often compete vigorously in other areas. These features are highly consistent with the 'dynamic network' form of organization that Miles and Snow (1986: 62) have reported is appearing, 'especially in service and high technology industries, as both a cause and a result of today's competitive environment.'

These local networks appear to constitute a new and distinct unit of analysis, positioned at an intermediate level between the firm and the industry. Accordingly, before conducting the

study's second wave of field interviews, we expanded the research design to obtain additional data from network brokers and affiliated executives.

Network brokers asserted that they were adding value by reconfiguring components of existing hospitals and connecting them to insurance providers and physician organizations. When asked to specify how value was added, brokers' responses fall into three categories: efficiency, power, and synergy. The *efficiency* argument emphasizes economies of scale and scope. Brokers say they offer superior executive talent, contracting expertise, and management information systems to affiliated components, and point to the network's ability to deliver contracted health services at geographically dispersed locations. The *power* argument emphasizes how coalescing amasses bargaining power vis-à-vis large public and private customers, and facilitates lobbying and other collective strategies. The *synergy* argument turns on linking separate components having unique competencies, each of which is able to pursue its core mission single-mindedly after diversionary activities have been stripped away and superfluous enterprises have been spun off.

Proposition 9: Revolutionary change within an industry precipitates affiliations spanning industry boundaries.

The brokers' claims, however, should not be accepted at full face value. Diversification and membership in multi-hospital systems—two largely unsuccessful strategies of the 1970s—also promised to add value through increases in synergy, efficiency, and power. In fact, a rather different picture emerged from our interviews with hospital executives, the principal actors that the brokers were endeavoring to connect. As the bottom row of Table 2 indicates, the rate at which network affiliations were being consummated and the benefits ascribed to affiliation were highly unstable over the period of our study. One trend, however, was unmistakable: as time passed, expectations of benefits arising from synergy, efficiency, or power gave way to an overarching desire to mitigate the extreme uncertainties arising from revolutionary change in the industry. The implication is that, by pooling information and fostering cooperation, regional health pro-

vider networks establish collective structures of interorganizational action (Pfeffer and Salancik, 1978).

Proposition 10: Interorganizational networks absorb uncertainty arising from revolutionary change.

Faced with declining financial performance, disaggregation, downsizing, and the realization that their industry has undergone a quantum change, some executives are systematically preparing their organizations for metamorphosis. Several believe so strongly that networks are a superior form that they expect them to drive their organizational ancestors into extinction, predicting that by the year 2000 there will be no free-standing hospitals left in the Bay Area. Other executives, determined to preserve their hospitals' autonomy, intend to continue adapting existing strategies and structures incrementally. The relative effectiveness of these two forms of organization-level change are likely to shape the structure of the hospital industry during the 1990s.

CONCLUSION

Social scientific theories stand in a dialectic relationship to the social systems they represent (Albrow, 1980). The conceptual framework presented in the first section of this paper was instigated by some enigmatic results of field research. In the next section the framework was used to classify models of organizational change, which emerge as being less contradictory and more complementary than they are usually assumed to be. Finally, in an historical exposition of changes within the hospital industry, the framework was reapplied to the setting that suggested it. This analysis demonstrated substantial variety in the rates, modes, and levels of change, and it offers several lessons for researchers in strategic management.

One lesson concerns the consequences of assumptions permeating much of the strategic management literature. Research typically assumes an equilibrium or quasi-stationary equilibrium model (Glick and Huber, 1989), and restricts its focus to incremental changes within firms (Zammuto and Cameron, 1985). Environments are generally held to be changing more

slowly than firms' capacities for adaptation. When these assumptions are valid, cross-sectional research designs can yield meaningful results. But when they are violated, the results of cross-sectional designs become uninterpretable and findings become non-cumulative, for such results are haphazard outcroppings of unidentified modes of change occurring at unknown levels.

Accordingly, a second lesson of this analysis is the value of theorizing and observing at multiple levels. Our research in hospitals initially took the firm as its principal unit of analysis, and was expanded subsequently by adding two more inclusive units—the industry and the interorganizational network. Each of these units of analysis was found to have a distinctive structure and to change according to its own dynamics. One implication is that industries cannot be adequately characterized by aggregating attributes of individual firms, and that firms' actions cannot be inferred or understood solely through analyses of industry-level data.

Higher-level units of analysis are usually assumed to change more slowly than are lower-level units (Freeman, 1978). Our inquiry into the hospital industry, however, suggests that during certain periods the velocity of change occurring within higher-level units can significantly exceed that occurring in lower-level units. Although the firm, network, and industry were distinct units of analysis, our study indicated that changes occurring at different levels can be highly interrelated. However, the temporally lagged and idiosyncratic character of these cross-level relationships makes them hard to discern unless longitudinal research designs are adopted. Our experience suggests that studying change at multiple levels over time requires a second-order change in organizational research methods, which have been characterized as mostly 'ahistorical, aprocessual, and acontextual in character' (Pettigrew, 1987: 655).

Although we have concentrated on the role of revolutionary change in the hospital industry, this setting is hardly unique. Other industries undergoing discontinuous change include financial services (Ballarin, 1986), telecommunications (Astley and Fombrun, 1983), electric power (Heffner, 1990; Russo, 1989), and airline transportation (Pearce, 1985). In each case the scope and intensity of change is changing; not continuously, but discontinuously; not incremen-

tally, but in abrupt shifts. Because such changes impose radically different competitive requirements, they can redraw industry boundaries, trigger metamorphic changes within organizations, and allow entrepreneurs to fashion new organizational forms. Such organizational innovations merit investigation, for they have been found to have greater effects than technological innovations on long-term organizational performance and survival (Damanpour and Evan, 1984; Huber, 1984).

Industries undergoing discontinuous change create dilemmas for managers as well as researchers. Discontinuous changes create opportunities for entrepreneurs by redefining viable niches and opening ecological space for new strategies and structural forms. Nevertheless, discontinuous change is enigmatic and paradoxical for managers caught up in it. It breaks the frame in which they have been operating, a frame which they probably have come to take for granted. The events triggering discontinuous changes can appear so inconsequential, and the onset can be so sudden, that managers often are forced to act before they understand of the consequences of acting. When turbulence subsides a new equilibrium may be achieved that is partly a product of those actions. In this sense, managers in the throes of revolutionary change assume the role of entrepreneurs reinventing both their organizations and their environments.

ACKNOWLEDGMENTS

This research was supported by the U.S. Army Research Institute for the Behavioral and Social Sciences (Grant #MDA-90385K040), with additional support from the University of Oregon's Charles H. Lundquist Center for Business Development. The authors are indebted to Kim Cameron, George Huber, Raymond Miles, Danny Miller, David Starkweather, Andrew Van de Ven and SMJ reviewers for their encouragement and constructive comments on earlier drafts.

REFERENCES

- Albrow, M. 'The dialectic of science and values in the study of organizations'. In G. Salancik and K. Thompson (eds), *Control and Ideology in Organizations*, MIT Press, Cambridge, MA, 1980.
- Andrews, Kenneth R. *The Concept of Corporate Strategy*. Dow Jones-Irwin, Homewood, IL, 1971.
- Ansoff, H. Igor. *Corporate Strategy*, McGraw-Hill, New York, 1965.
- Argyris, Chris and Donald Schön. *Organizational Learning: A Theory of Action Perspective*, Addison-Wesley, Reading, MA, 1978.
- Astley, W. Graham. 'The two ecologies: Population and community perspectives on organizational evolution', *Administrative Science Quarterly*, **30**, 1985, pp. 224-241.
- Astley, W. Graham and Charles J. Fombrum. 'Collective strategy: Social ecology of organizational environments', *Academy of Management Review*, **8**(4), 1983, pp. 567-587.
- Astley, W. Graham and Andrew Van de Ven. 'Central perspectives and debates in organization theory', *Administrative Science Quarterly*, **28**, 1983, pp. 245-273.
- Ballarin, E. *Commercial Banks and the Financial Revolution*, Ballinger, Cambridge, MA, 1986.
- Barley, Steven R. and Pamela S. Tolbert. 'Institutionalization as structuration: Methods and analytic strategies for studying links between action and structure'. Paper presented at the Conference on Longitudinal Field Research Methods for Studying Organizational Processes, Austin, TX, 1988.
- Barney, Jay B. 'Types of competition and the theory of strategy: Toward an integrative framework', *Academy of Management Review*, **11**(4), 1986, pp. 791-800.
- Boroy, Bryan and David B. Jemison. 'Hybrid arrangements as strategic alliances: Theoretical issues in organizational combinations', *Academy of Management Review*, **14**(2), 1989, pp. 234-249.
- Bresser, Rudi K. F. 'Thatching collective and competitive strategies', *Strategic Management Journal*, **9**, 1988, pp. 375-385.
- Carroll, Glenn R. 'Organizational ecology', *American Review of Sociology*, **10**, 1984, pp. 71-93.
- Caves, Richard E. and Michael E. Porter. 'From entry barriers to mobility barriers: Conjectural decisions and contrived deterrence to new competition', *Quarterly Journal of Economics*, **91**, 1977, pp. 241-262.
- Child, John. 'Organizational structure, environment and performance: The role of strategic choice', *Sociology*, **6**, 1972, pp. 2-22.
- Damanpour, Fariborz and William M. Evan. 'Organizational innovation and performance: The problem of organizational lag', *Administrative Science Quarterly*, **29**, 1984, pp. 392-409.
- DiMaggio, Paul J. and Walter W. Powell. 'The iron cage revisited: Institutional isomorphism and collective rationality in organizational fields', *American Sociological Review*, **48**, 1983, pp. 147-160.
- Edwards, Mary, John D. Miller and Rex Schumacher. 'Classification of community hospitals by scope of services: Four indexes', *Health Services Research*, **7**, 1972, pp. 301-312.
- Fennell, Mary L. and Jeffrey A. Alexander. 'Organizational boundary spanning in institutionalized environments', *Academy of Management Journal*, **30**(3), 1987, pp. 456-476.
- Freeman, John. 'The unit of analysis in organizational

- research'. In M. Meyer and Associates (eds), *Environments and Organizations*, Jossey-Bass, San Francisco, CA, 1978.
- Ginsberg, Ari. 'Measuring and modeling changes in strategy: Theoretical foundations and empirical directions', *Strategic Management Journal*, **9**(6), 1988, pp. 559-575.
- Glick, William H. and George P. Huber. 'Studying changes in organizational design and effectiveness: Retrospective event histories and periodic assessments'. Working paper, University of Texas, 1989.
- Goes, James G. 'Environmental changes and network strategies in the hospital industry'. Paper presented at 1988 Academy of Management meetings, Anaheim, CA, 1988.
- Gould, S. J. *Ever Since Darwin: Reflections in Natural History*, Penguin Books, New York, 1977.
- Gould, Steven J. and Niles Eldredge. 'Punctuated equilibria: the tempo and mode of evolution reconsidered', *Paleobiology*, **3**, 1977, pp. 115-151.
- Greiner, Larry E. 'Evolution and revolution as organizations grow', *Harvard Business Review*, **50**, July-August 1972, pp. 37-46.
- Hannan, Michael T. and John Freeman. 'The population ecology of organizations', *American Journal of Sociology*, **83**, 1977, pp. 929-964.
- Hannan, Michael T. and John Freeman. 'Structural inertia and organizational change', *American Sociological Review*, **49**(2), 1984, pp. 149-164.
- Heffner, Grayson. 'Strategic choice by California's electric utilities: A comparative case analysis of organizational adaptation in response to environmental change'. Unpublished doctoral dissertation, George Washington University, Washington DC, 1990.
- Hofer, C. W. and D. Schendel. *Strategy Formulation: Analytical Concepts*, West, St Paul, MN, 1978.
- Hrebiniak, Lawrence G. and William F. Joyce. 'Organizational adaptation: Strategic choice and environmental determinism', *Administrative Science Quarterly*, **30**, 1985, pp. 336-349.
- Huber, George P. 'The nature and design of post-industrial organizations', *Management Science*, **30**, 1984, pp. 928-951.
- Hunt, M. S. 'Competition in the major home appliance industry 1960-1970'. Unpublished doctoral dissertation, Harvard University, 1972.
- Jarillo, J. Carlos. 'On strategic networks', *Strategic Management Journal*, **9**(1), 1988, pp. 31-41.
- Katz, D. and R. L. Kahn. *The Social Psychology of Organizations*, 2nd edn, Wiley, New York, 1978.
- Kimberly, John R. and Robert H. Miles. *The Organization Life Cycle*, Jossey-Bass, San Francisco, CA, 1980.
- McGee, John and Howard Thomas. 'Strategic groups: Theory, research and taxonomy', *Strategic Management Journal*, **7**(2), 1986, pp. 141-160.
- McKelvey, B. *Organizational Systematics: Taxonomy, Evolution and Classification*, University of California Press, Berkeley, CA, 1982.
- McKelvey Bill and Howard Aldrich. 'Populations, natural selection and applied organizational science', *Administrative Science Quarterly*, **28**, 1983, pp. 101-128.
- Meyer, Alan D. 'Management and strategy: The case of the voluntary hospital'. In R. E. Miles and C. C. Snow, *Organizational Strategy, Structure and Process*, McGraw-Hill, New York, 1978, pp. 214-245.
- Meyer, Alan D. 'Adapting to environmental jolts', *Administrative Science Quarterly*, **27**, 1982, pp. 515-537.
- Meyer, Alan D. 'Organization design, intelligence, ideology and adaptation'. Working paper, University of Oregon, 1985.
- Meyer, Alan D., Geoffrey R. Brooks and James G. Goes. 'Industries and organizations in flux: First and second order theories of change'. Paper presented at Academy of Management meetings, Washington, DC, 1989.
- Meyer, Alan D. and James G. Goes. 'Industrial metamorphosis and organizational adaptation'. Paper presented at the Academy of Management meetings: Anaheim, CA, 1987.
- Meyer, John W. and Brian Rowan. 'Institutionalized organizations: Formal structure as myth and ceremony', *American Journal of Sociology*, **83**(2), 1977, pp. 340-363.
- Miles, Raymond E. and Charles C. Snow. *Organizational Strategy, Structure and Process*, McGraw-Hill, New York, 1978.
- Miles, Raymond E. and Charles C. Snow. 'Organizations: New concepts for new forms', *California Management Review*, **28**(3), 1986, pp. 62-73.
- Miles, Robert and Kim Cameron. *Coffin Nails and Corporate Strategies*, Prentice-Hall, Englewood Cliffs, NJ, 1982.
- Miller, D. and P. H. Friesen. *Organizations: A Quantum View*, Prentice-Hall, Englewood Cliffs, NJ, 1984.
- Mintzberg, Henry and Alexandra McHugh. 'Strategy formation in an adhocracy' *Administrative Science Quarterly*, **30**(2), 1985, pp. 160-197.
- Normann, R. 'Organizational innovativeness: Product variation and reorientation', *Administrative Science Quarterly*, **16**, 1971, pp. 203-215.
- Pearce, John A. II. 'Note on the deregulated airline industry'. In J. A. Pearce and R. B. Robinson (eds), *Strategic Management*, 2nd edn, Irwin, Homewood, IL, 1985.
- Perrow, Charles. 'Hospitals: Technology, goals and structure'. In J. March (ed) *Handbook of Organizations*, Rand McNally & Co., Chicago, IL, 1965, pp. 910-971.
- Pettigrew, Andrew M. 'Context and action in the transformation of the firm', *Journal of Management Studies*, **24**(6), 1987, pp. 649-670.
- Pettigrew, Andrew M. 'On studying organizational cultures', *Administrative Science Quarterly*, **24**, 1979, pp. 570-581.
- Pfeffer, J. and G. Salancik. *The External Control of Organizations*, Harper & Row, New York, 1978.
- Porter, M. E. *Competitive Strategy: Techniques for Analyzing Industries and Competitors*, Free Press, New York, 1980.

- Quinn, James B. 'Strategic change: Logical incrementalism', *Sloan Management Review*, Fall 1978, pp. 7-19.
- Russo, Michael V. 'Regulation, deregulation and the structuring of organizations'. Working paper, University of Oregon, 1989.
- Scherer, F. M. *Industrial Market Structure and Economic Performance*, Houghton Mifflin, New York, 1980.
- Schumpeter, J. A. *Capitalism, Socialism and Democracy*, Harper & Row, New York, 1950.
- Scott, W. R. *Organizations: Rational, Natural and Open Systems*, 2nd edn, Prentice-Hall, Englewood Cliffs, NJ, 1987.
- Starbuck, William H. 'Acting first and thinking later: Theory versus reality in strategic change'. In J. M. Pennings (ed.), *Organizational Strategy and Change*, Jossey-Bass, San Francisco, CA, 1985.
- Thorelli, Hans B. 'Networks: Between markets and hierarchies', *Strategic Management Journal*, 7, 1986, pp. 37-51.
- Tushman, Michael L. and Philip Anderson. 'Technological discontinuities and organizational environments', *Administrative Science Quarterly*, 31, 1986, pp. 439-465.
- Tushman, Michael L. and Elaine Romanelli. 'Organizational evolution: A metamorphosis model of convergence and reorientation'. In L. L. Cummings and B. M. Staw (eds), *Research in Organizational Behavior*, vol. 7, JAI Press, Greenwich, CT, 1985.
- Ungson, Gerardo R. *Competitive Strategies in High Technology: Meeting Organizational, Strategic and Institutional Challenges*, D. C. Heath, Lexington, MA, 1989 (In press).
- Van de Ven, Andrew and Raghu Garud. 'A framework for understanding the emergence of new industries'. In R. Rosenbloom and R. Burgelman (eds), *Research on Technological Innovation, Management and Policy*, vol. 4, JAI Press, Greenwich, CT, 1987.
- Watzlawick, P., J. H. Weakland and R. Fisch. *Change: Principles of Problem Formation and Problem Resolution*, Norton, New York, 1974.
- Wegmiller, Donald C. 'Management issues of multihospital systems', *Health Care Management Review*, 10(2), 1985, pp. 9-16.
- Zajac, Edward J. 'Interlocking directorates as an interorganizational strategy: A test of critical assumptions', *Academy of Management Journal*, 31(2), 1988, pp. 428-438.
- Zajac, Edward J. and Stephen M. Shortell. 'Changing generic strategies: Likelihood, direction, and performance implications', *Strategic Management Journal*, 10(5), 1989, pp. 413-430.
- Zammuto, Raymond F. and Kim S. Cameron. 'Environmental decline and organizational response', in L. L. Cummings and B. M. Staw (eds), *Research in Organizational Behavior*, vol. 7, JAI Press, Greenwich, CT, 1985, pp. 223-262.
- Zucker, Lynne G. 'Institutional theories of organizations', *Annual Review of Sociology*, 13, 1987, pp. 443-464.