Beyond Bouncing Back: The Concept of Organizational Resilience

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Abstract

The knowledge economy amplifies a number of organizational challenges. Among these is the need to be able to thrive despite turbulent, uncertain, and often threatening events. Organizational resilience has, therefore, received a great deal of recent attention from managers and consultants. While this concept has appeared in the academic literature, no comprehensive definition of organizational resilience has been developed. This paper fills that gap by proposing a clear, measurable, component-based definition of organizational resilience and a model of the antecedents, compositional dimensions, and consequences of this concept. Organizational resilience is considered a pattern rather than a prescribed series of steps or activities. It is seen as a transformational capability and as such is a complex blend of perspectives, behaviors, processes, and contexts. Because of its transformational thrust, organizational resilience enables a firm to flourish in circumstances in which others attempt only to cope. Finally, organizational resilience is triggered by a distinctive, discontinuous event that creates vulnerability and requires an unusual response. We begin by explaining why the knowledge economy intensifies the need for resilience. Next, commonalities and differences between individual and organizational resilience are examined. A definition and model of the construct is offered. Three component dimensions of the conceptual model are explained: cognitive resilience, behavioral resilience, and contextual resilience. Antecedent conditions that facilitate organizational resilience are described and the beneficial consequences of organizational resilience are identified. We conclude with implications for future research.

Sometimes the unthinkable happens. A firm dedicated to healthy products and improving quality of life finds that its product has killed a customer. Due to terrible mistakes at Odwalla Inc. in 1966, a little girl died from drinking apple juice contaminated with E. coli bacteria. Criminal acts by individuals outside Johnson & Johnson led to the Tylenol poisoning crisis in the early 1980's in which seven people in the Chicago area died from tainted capsules. Both these firms responded to their crisis in ways that not only dealt effectively with the tragic situation, but also enhanced their core capabilities and enabled the organizations to thrive (Collins & Porras, 1994). Odwalla is the country's number-one distributor of fresh juices and has used its profits to expand into new products and new markets (Layne, 2001). In 2002, Johnson & Johnson was ranked first by pharmaceutical executives in terms of ethical reputation, and received awards as one of the best companies to work for, obtained a Global Corporate Achievement Award that recognized firms delivering outstanding performance in volatile economic conditions, and topped the Business Week 50 ranking the country's best performing, large public corporations. Other firms facing similar crises, such as Bristol-Myers and the tainted Excedrin tablets, were at best able to cope with the situation and minimize long-term losses.

Sometimes the undesirable jolts a firm out of its routine. A fire crippled Philips Electronics' mobile-phone chip factory in spring 2000, leaving Nokia and Ericsson without their key supplier Nokia responded in a way that turned adversity into advantage, while Ericsson lost months of production and large chucks of market share (Hammonds, 2002). Nokia sent its employees to help Philips recover, increased orders from other Philips facilities, used its network to secure other suppliers, and capitalized on Ericsson's stagnation by introducing new phones.

Sometimes the very nature of the business a firm is in creates unpredictable, adverse, uncontrollable, and potentially devastating surprises. Biotechnology firms are all too familiar with failed trials, delayed regulatory approval, new discoveries that replace existing

technologies, and a host of other discontinuous events that shake a firm's momentum and challenge its ability to continue. Some companies like Biogen and Amgen are able to flourish despite these blows. They have expanded their product lines and market reach while advancing biotechnology research, while others such as Alpha-Beta technology and MedImmune struggle to maintain solvency. Biogen, for example, nearly went bankrupt in 1983 when its premier drug, gamma interferon, experienced serious troubles during clinical trials at the same time that their diversified R&D strategy absorbed huge amounts of cash (Eccles & Nohria, 1998). The financial crisis initiated a new vision and redesigned relationships that transformed the company into the thriving biopharmaceutical firm it is today.

What do these scenarios have in common? First, in each of these scenarios firms were faced with unanticipated, disruptive shocks to their normal routine that both challenged the firm's knowledge and capabilities and stressed established organization activities. Second, the disruptive events originated outside the firm's boundaries; they were not the result of radical changes planned and initiated by the organization. Third, the challenges created were sufficiently severe that no response, or the wrong reaction, could cause organizational failure. Finally, these scenarios describe situations in which resilient organizations did more than bounce back from the edge of catastrophe; they used the unsettling experience to move forward with even greater vigor and success than before the jolt. The emerging construct of organizational resilience appears to distinguish between the firms that thrive as a consequence of unexpected challenge and the firms that at best make a slow recovery.

Organizational resilience has been mentioned in the literature with increasing frequency over the past decade. Collins and Porras (1994), for example, note that firms with genuine core values are more resilient that firms without such guiding principles. Weick (1993) links resilience and sensemaking in his discussion of factors that make organizations less vulnerable to

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disruptions. More recently Horne and Orr (1998) identified behaviors that tend to create resilient organizations. Their observations draw from the juxtaposition of principles regarding strengths of materials in engineering and propositions about the dynamics of complex ecosystems. Some authors link resilience with hardiness (e.g., Rusk, Schoel, & Barnard, 1996; Maddi, 1987). Others tie resilience to adaptability and radical change (e.g., Aitken, 1999; Guidimann, 2002). Yet, it appears there are important differences among these concepts.

The past year has seen organizational resilience discussed with particular urgency as businesses and society attempt to respond effectively to terrorist attacks, economic downturns, and other turbulent disruptions (Coutu, 2002). Yet, to date, organizational resilience has not been comprehensively or consistently defined. Definitions range from descriptions of adaptive effects, to comparisons with dysfunctional behaviors in the face of adversity, to observations of survival. Most authors have relied on descriptive characterizations that identify the outcomes of organizational resilience rather than construct definitions that capture the dimensions that comprise organizational resilience.

The purpose of this paper is to fill that gap and provide a clear, component-based definition of organizational resilience and a model of the antecedents, compositional dimensions, and consequences of this concept that can provide a framework for empirical examination. Organizational resilience is an increasingly important concept to understand since several characteristics of the knowledge economy create an environment in which unanticipated and threatening disruptions are ever more frequent occurrences. The convergence of different economic sectors coupled with the boundarylessness of many enterprises increases the probability of disruptive and unprecedented change (Tapscott, 1996; Burton-Jones, 1999). This convergence both increases the range of knowledge and activities likely to buffet an organization and ensures that more connections will be needed to gain the necessary expertise to compete

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effectively. In addition, the level of connectedness between individuals, groups, organizations and economic sectors is significantly greater in the knowledge economy than in any prior industrial era. As Weick (1990) argues, a tight connection among interdependent systems facilitates, amplifies, and rapidly spreads the consequences of multiple small errors. The webs of relationships and interdependencies common in the knowledge economy create configurations that are particularly vulnerable to creating potentially large disasters from various small events. As Guidimann (2002) explains, the likelihood of quick and drastic erosions in markets increases as participants and their organizational systems become increasingly entangled. The knowledge economy also dilutes the need for physical concentration of people or resources to accomplish organizational work (Burton-Jones, 1999). This dispersal, or demassification of activity, increases organizational exposure to environmental jolts. Furthermore, business often takes place in real time in the knowledge economy. The elimination of delays between steps in a process, between production and consumption, and between conceptualization and action increases the likelihood of error and typically removes any remaining organizational slack that could serve as a buffer. Slack resources have a stronger influence on a firm's ability to respond effectively to environmental jolts than either anticipation or adjustment capabilities (Meyer, 1982). In addition, the amount of information that can be gathered about a situation is staggering (Horne & Orr, 1998). The knowledge economy has, at the very least, altered our awareness of the rate and magnitude of radical change taking place. Finally, important strategic knowledge is intangible and often ephemeral. Therefore information surprises and new insights are commonplace. These factors combine to create an environment in which episodic, severe disruptions that an organization cannot anticipate, prevent, or defer will be a fact of business life for many firms.

We begin by reviewing the existing research on resilience and by drawing distinctions between individual resilience and organizational resilience. Next we define the concept of organizational resilience in terms of three compositional dimensions: cognitive resilience, behavioral resilience, and contextual resilience. We then discuss the antecedents and consequences of resilient organizations and provide a model of the conceptual domain. We conclude with implications for future research.

DEFINING ORGANIZATIONAL RESILIENCE

While the academic literature in management includes periodic references to resilience (e.g., Collins & Porras, 1994; Weick, 1993) much of the work related to this concept has been in the field of psychology. It has, therefore, focused on resilience in individuals, rather than organizational resilience. Most discussions of organizational resilience have targeted practitioner audiences and not laid a strong foundation for rigorous research. Work related to organizational resilience often has strong face validity and anecdotal support, but has not been the focus of empirical examination. Rigorous research requires the development of a clear, measurable construct definition and model of organizational resilience.

Maddi & Kahn, 1982; Maddi, 1987; Westman, 1990). These studies proposed that hardiness results from a constellation of characteristics including commitment, control, and challenge. While Maddi equates hardiness with resilience, we contend that they are different constructs. We see hardiness as an ability to withstand and cope with stressful circumstances, whereas resilience includes the ability to turn challenges into opportunities. In addition there are significant questions regarding the measurement and purported effects of hardiness on stress reduction (Funk, 1992). Yet the hardiness research stream offers useful insights for beginning to understand organizational resilience.

Systemic Interactions

The relationship between individual resilience and organizational resilience reflects the interaction between systems and subsystems described by Ashmos and Huber (1987). That is, "systems of any class possess not only the common properties of other systems at their level, but they also possess the properties of their component, lower-level systems, except as the properties of the components are modified by their relationship with the whole" (Ashmos & Huber, 1987: 607). Because organizations are social systems, organizational capabilities such as resilience are the result of effectively blending intellectual capital, social capital, human capital and other more tangible resources. Organizational capabilities are not simply additive composites of individual capabilities, however. The interaction effects make a great deal of difference. Moreover, while the contributing elements that lead to individual resilience may have some parallels at the organization level of analysis, the more complex social network in which they are enacted alters both the development and realization of these elements in important ways. Therefore, we will use what is known about individual resilience to help build our conceptual model of organizational resilience, but we will not assume that the factors are identical across the two levels of analysis. In addition, since organizations are not anthropomorphic it is obvious that

individual capabilities *used collectively* are what enable organizational resilience. Therefore the proposed model relies on collaborative interactions and concentrates on the system behavior at the organization level of analysis.

This reasoning leads to two important implications. One, resilient individual organization members do not necessarily yield resilient organizations. Weick's (1993) compelling analysis of the behaviors of a group of smokejumpers in the Mann Gulch disaster vividly illustrates this point. Three resilient individuals were able to survive, but their personal capabilities were not enough to persuade the group to act in a resilient way and consequently thirteen men died in the fire. Home and Orr (1998) argue that resilient individuals may, in fact, be counterproductive for creating a resilient organization since they may overpower effective organizational processes.

Two, individuals who are not resilient on their own can become collectively resilient. Nothing suggested that Odwalla employees were resilient or even unusually tough before the firm faced the crisis that might have destroyed it; yet together these individuals were able not only to weather the storm, but also to learn lessons that moved the firm towards new standards of excellence. It appears that an emergency can trigger new behaviors, ways of thinking, and relationships that develop resiliency in organizations.

Recent work in the management field dealing with resilience (e.g., Coutu, 2002; Mallak, 1998a, 1998b; Home, 1997; Home & Orr, 1998) has been targeted toward a practitioner audience and therefore has not developed a consistent definition that is amenable to rigorous research. As illustrated in Table 1, many of these descriptions emphasize outcomes or consequences of resilience, rather than the construct itself. In addition, many are stated indirectly in the respective studies and do not appear to have been deliberately crafted to

establish clear boundaries of what organizational resilience encompasses and what it does not include.

A New Definition

We propose the following working definition of organizational resilience:

Organizational resilience is a composite pattern of cognitive, behavioral, and contextual characteristics that promotes advantageous organizational transformation when confronted with a discontinuous disruption.

There are several key aspects of this definition. First, organizational resilience is not a specified set of change activities. Equifinality demonstrates that complex systems are able to devise many effective approaches and methods for achieving a desired outcome. Therefore, rather than specifying a particular set of actions or responses, we define organizational resilience in terms of a particular type of composite organizational pattern. The specifics may vary, but the pattern reflects certain distinguishing cognitive elements, behaviors, and contextual characteristics. Second, we see organizational resilience as a transformational capability. Similar to the concept of transformational coping, organizational resilience includes a constellation of cognitions, behaviors, and contextual factors that enables a firm to interpret unfamiliar situations, devise new ways of confronting these events, decide upon worthwhile change strategies to pursue, and mobilize people, resources and processes to transform these choices into reality (Kobasa, Maddi, Puccetti, & Zola, 1985). Thus, organizational resilience is a complex blend of behaviors, perspectives, and interactions that can be developed, measured, and managed. Third, organizational resilience goes beyond recovering lost ground. It is not sufficient to merely cope with stress, adjust to new demands, or handle disruptions; people and firms must be able to move beyond mere survival and actually prosper in complicated uncertain environments (Aitken, 1999: 54). In our definition, resilience is thriving and becoming better in part *because* a firm was faced

with serious challenges that were overcome. Finally, organizational resilience is triggered by a distinctive, discontinuous event that puts the organization in a vulnerable position and requires an unusual response. If discontinuity is the norm as one might find in a hypercompetitive environment, then successful firms are those that establish routines for taking initiative, disrupting the status quo, and developing an aggressive and unconventional action repertoire (Ferrier, Smith & Grimm, 1999). Hypercompetitive strategies are quite different from organizational resilience in that they are deliberately orchestrated and reflect a specific strategic intent (D'Aveni, 1994). The proposed definition of organizational resilience describes a capability that creates a unique answer to a specific context and situation rather than an established response format designed to react to an enduring condition.

COMPONENTS OF ORGANIZATIONAL RESILIENCE

Articulating three component dimensions expands the definition of organizational resilience: cognitive resilience, behavioral resilience, and contextual resilience. A model illustrating the overall conceptual framework is depicted in Figure 1.

Cognitive Resilience

Cognitive resilience is the mental orientation and collective intellectual abilities of a firm that enable a critical mass of organization decision makers to perceive, interpret, and analyze a discontinuous disruption (i.e., unplanned, surprising, jolting event that severely challenges the status quo) in a way that promotes advantageous organizational transformation. Five factors comprise cognitive resilience: (1) learned organizational confidence, (2) constructive sensemaking, (3) entrepreneurial orientation, (4) virtual role systems, and (5) realistic wisdom.

Learned organizational confidence. Self-efficacy is learned confidence in one's ability to perform a needed task or achieve a particular outcome in a given situation (Hackett & Betz, 1981; Mallak, 1998b). This confidence is based on the experience ability "to mobilize the

motivation, cognitive resources, and courses of action needed to meet given situational demands" (Wood & Bandura, 1989: 408). Self-efficacy can have an important influence on performance through its effect on behavioral choices such as effort, persistence and goal selection (Gist & Mitchell, 1992). While typically studied in individuals, learned organizational confidence in a firm's competencies and ability to deploy them effectively could be expected to have a similar consequence for organizational goal setting, commitment, and investment.

Why is learned confidence a key element of cognitive resilience? Learned confidence increases the probability that a firm will elect to follow an unconventional path if analysis suggests it is the most desirable option. Since resilience is needed when routine behaviors and solutions are inadequate to meet unusual challenges, a mindset that encourages calculated risk-taking leads to effective performance. Consequently resilient organizations and resilient people must have confidence in their ability to devise unconventional solutions to unfamiliar situations.

Constructive sensemaking. Sensemaking is described as "the reciprocal interaction of information seeking, meaning ascription, and action" (Thomas, Clark & Gioia, 1993: 240). Weick (1995) argues that sensemaking has its roots in both individual and social activity. If an organization is considered an interpretive system, then resilient organizations are those that are able to effectively sense, comprehend, interpret, explain, and make judgments about the situations they encounter in ways that enable the firm to formulate a responsive action. This cognitive ability is particularly important when events are unprecedented and require responses that go beyond the organization's normal repertoire. Sensemaking is constructive to the extent that it provides enough certainty for the organization to take *robust* action. Robust actions are those that "accomplish short term objectives while preserving long-term flexibility" (Eccles & Nohria, 1998: p.52). Effective short-term actions enable a firm to cope with the emergency, but

the long-term flexibility of robust actions enables the organization to act on new knowledge and insights that are created along the way, and thus capitalize on new capabilities.

Several component cognitive capabilities have been shown to contribute to constructive sensemaking at the individual level. Some of the most crucial are an empowering interpretation of the world (Aitken, 1999), a positive perception of experiences (Mallak 1998a, 1998b), an enactment perspective (Weick, 1988), a realistic view of circumstances (Coutu, 2002), and a tolerance for uncertainty (Mallak, 1998b). A positive orientation and sense of control reduces the prevalence of complaints, denial, avoidance and similar dysfunctional coping mechanisms. An enactment perspective recognizes that early and incremental responses to a situation create future conditions. A tolerance for uncertainty enables a perspective that goes beyond the immediate discomfort in the search for knowledge and long-term effectiveness.

Each of these components of individual resilience has a parallel at the organization level. Thomas, Clark and Gioia (1993) demonstrated a strong link between the sensemaking activities of scanning, interpretation and action, and organization performance. Firms can foster a positive, constructive orientation through a strong sense of purpose and through core values and a genuine vision (Collins & Porras, 1994). The way in which an issue is framed and labeled (e.g., as a problem or an opportunity) influences the type of response that is generated (Dutton, Fahey, & Narayanan, 1983). The labels used to describe an issue affect subsequent behaviors in terms of risk, commitment, engagement, and persistence (Dutton & Jackson, 1987). Collective sensemaking relies on the language of the organization, its words, images and stories, to construct meaning and describe situations and imply both meaning and emotion (Weick, 1995). Thus, the conceptual anchors an organization uses to sort and interpret events shapes the kind of sense it will make out of the situation. We suggest, therefore, that if the prevailing vocabulary of

a firm implies capability, influence, competence, consistent core values, and a clear sense of direction, the organization will set the stage for constructive sensemaking.

Entrepreneurial orientation. Entrepreneurial organizations differ from stable, ordered, controlled organizations in several important respects. In firms with an entrepreneurial orientation people think differently about themselves, their relationships with others, their responsibilities, and the setting in which they work (Jelinek & Litterer, 1995). An entrepreneurial orientation means that people think of themselves as initiators and as responsible for the results of the actions they take. Entrepreneurial organizations emphasize stewardship, the willingness to be accountable for the well-being of the organization or larger system (Block (1993). An entrepreneurial orientation encourages coordination through shared understanding and mutual adjustment to innovative choices rather than from following standard procedures. For this to occur a shared cognitive map and strong commitment to shared values must be encouraged along with diversity of experience and expertise. In entrepreneurial firms the responsibility for making choices is taken particularly seriously.

An entrepreneurial orientation creates a mindset in which a deliberate effort is made to match actions to situations. Thus, it is less likely that a standardized reaction would be automatically initiated in response to unfamiliar circumstances. An entrepreneurial orientation facilitates double-loop learning in which basic assumptions, as well as prevailing answers, are questioned. As Argyris (1976) explains, double-loop learning is essential for effectively navigating ambiguous, ill-structured, and complex situations. Cognitive resilience depends on maintaining a balance between inquiry and commitment, between taking initiative and collaborating with others, and between divergent and convergent thinking. As Weick, (1995: 168) so eloquently explains, if a firm is willing to 'leap before it looks' then it is poised to pounce upon what it has created as a means to gain increased understanding of what is going on.

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Virtual role systems. As acknowledged previously, organizational resilience is a system-level phenomenon that incorporates individual level cognitive activities. When an organizational crisis takes place it is not always possible to physically gather all the relevant decision makers to make sense of the situation and determine a course of action. When independent analysis and interpretation is required, Weick (1993) encourages the social construction of a virtual role system in which individuals can fill in the missing perspectives in their own minds. Clearly this requires deep and substantial understanding of a variety of individual roles and relationships. In ambiguous circumstances, a virtual role system allows an individual or group to construct a cognitive simulation of the organization's expertise and to project the rippling consequences of various options. This ability to mentally tap into an expanded repertoire of alternatives and to anticipate the long-term consequences of various choices contributes to robust choices. As Mallak (1998a; 1998b) explains, virtual role systems enable the continuity of a team even when some of the members are absent, and, as will be discussed later, it is one element in creating a holographic organization design.

Realistic wisdom. Wisdom is an attitude taken toward what is known that blends caution and confidence in such a way that expertise leads to understanding at the same time that skepticism leads to curiosity and the search for new information (Weick, 1993). Both excessive caution and excessive certainty reduce organizational resilience. If we know very little about a situation it often appears quite simple. But, as we learn more, we become aware of nuances, complexities and unanswered questions that ensure that "ignorance and knowledge grow together" (Meacham, 1983: 130). In this way wisdom relies on knowledge gained through past experience but it does not stop there. Wisdom is the recognition that each situation contains unique features that may be quite subtle but that can be incredibly powerful in shaping consequences, relationships and actions.

Wisdom is neither optimistically putting a positive 'spin' on a situation, nor is it pessimistically seeing only threats and problems. Similar to Senge's (1990) contention that the creative tension leading to organizational learning comes from a realistic appraisal of an organization's current state and a clear sense of where it wants to go, the constructive attitude leading to organizational resilience comes from a realistic appraisal of the situation coupled with a clear sense of purpose.

Realistic wisdom is also an interplay between present details and the future big picture to create a sense of perspective (Muoio, 2000). The alertness or mindfulness that prompts an organization to continuously consider and refine its expectations and perspectives on current functioning enables a firm to more adeptly manage the complexities of unexpected events (Weick & Sutcliff, 2001).

Why is realistic wisdom crucial for creating organizational resilience? Effective unconventional solutions to unprecedented challenges are neither reckless nor timid. The mindset that enables a firm to move forward with flexibility is often an intricate blend of expertise, opportunism, creativity, and decisiveness despite uncertainty. If a firm is too bound by conventional answers or precedent, it will have great difficulty conceiving a bold new path. If a firm disregards real constraints it will forge infeasible solutions. Resilience requires a firm grasp on reality and a relentless desire to question fundamental assumptions.

Importance of cognitive resilience. Cognitive resilience provides the conceptual orientation that encourages an organization to notice, interpret, analyze, and formulate responses in ways that go beyond simply surviving an ordeal. Cognitive resilience creates a mental model for an organization that frames issues in ways that encourage development rather than coping, and capability enhancement rather than merely adjustment. In addition, cognitive resilience sets the stage for many of the activities that lead to resilient behaviors.

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Behavioral Resilience

Behavioral resilience is the interactions and activities that allow organization members to collaboratively respond to a discontinuous disruption in ways that promote advantageous organizational transformation. Five elements comprise behavioral resilience: (1) learned resourcefulness, (2) counterintuitive actions, (3) functional habits, (4) behavioral preparedness, and (5) non-stop conversation.

Learned resourcefulness. Resourcefulness, ingenuity, inventiveness, bricolage are all related behaviors that enable individuals and organizations to engage in disciplined creativity to devise unconventional, yet robust, responses to unprecedented challenges (Coutu, 2002, Mallak, 1998b, Weick, 1993). Resourcefulness is typically a combination of creativity and initiative that enables an organization to capitalize on an immediate situation (Lengnick-Hall & Lengnick-Hall, 2002). Resourceful organizations have the ability to take whatever is at hand and turn it into a useful purpose that moves the firm forward. This can lead to several advantages including quick and effective action and the ability to capitalize on rapid response opportunities. Resourcefulness enables people and firms to do more with less and to use all of their resources to full advantage. The initiative that fosters resourcefulness requires self-reliance, stewardship, trust and courage.

Self-reliance is the willingness to act on one's own judgment. Organization members must feel competent to collectively observe and assess a situation, determine a course of action, and then implement it regardless of whether or not it conforms to prevailing industry norms. Likewise, stewardship reflects a sense of responsibility for making a value-added contribution as well as accountability for long-term organizational, and potentially system-wide consequences. These two factors suggest that several elements of cognitive resilience are prerequisites for learned resourcefulness. Trust, according to the Marines (U.S. Marine Corps, 1989) is a product

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of confidence resulting from demonstrated competence joined with familiarity developed from shared experiences and a common philosophy. As organizations attempt and succeed at bold, innovative moves, they develop both experience and confidence. Coutu (2002) describes this as 'ritualized ingenuity.' Finally, courageous behavior is acting decisively despite uncertainty and lack of consensus. Courageous behaviors reflect many of the elements discussed under cognitive resilience: an active orientation, authenticity, a realistic appraisal of unpleasant facts, and an internal locus of control (Orr & Westman, 1990). Self-reliance, stewardship, trust and courageous acts are behavioral expressions of organizational attitudes. These competencies benefit from deliberate organizational investments in training, experimentation, experience, and accurate knowledge of results.

One of the most significant aspects of resourcefulness is that it can be learned with experience and practice. Organizations that develop cultures of creativity, such as 3M and Chaparral Steel, augment the resourceful tendencies of their members through their value systems, resource allocation methods, relationships, and goals. Likewise, military Special Forces units hone individual and collective resourcefulness to enable teams to overcome obstacles and invent solutions to unconventional problems. The specific skills and capabilities that comprise resourcefulness can be learned. For example, divergent thinking skills can be developed through brainstorming, devil's advocacy techniques and dialog (Senge, Kleiner, Roberts, Ross & Smith, 1994). Problem solving techniques that rely on frequent iterations serve as catalysts for new ideas and increase the odds of success simply because there are more options available for consideration (Eisenhardt & Tabrizi, 1995). Data systems that provide knowledge of not only what works, but also why things operate the way they do provide a rich foundation for experimentation and learning.

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Counterintuitive actions. Balu (2001) observed that resilient individuals often take a road that differs greatly from their previous path when faced with a challenge. Likewise one of the most noteworthy findings in Meyer's (1982) study of hospitals responding to the sudden and unprecedented jolt of striking physicians was that the resilient hospitals chose paths that were counterintuitive given their normal operating habits. Therefore, it appears one of the behaviors that contributes to resilience is the ability to follow a dramatically different course of action from that which is the norm for the organization.

What are some of the characteristics that enable a radical departure from an organization's familiar routine? Ferrier et al. (1999) suggest that having a broad strategic repertoire from which to choose expands an organization's options. In addition, as noted previously, cognitive characteristics such as learned organizational confidence, constructive sensemaking, and an entrepreneurial orientation increase the likelihood that an organization will be able to think outside the familiar routine. Finally, organizations can orchestrate opportunities for sharing ideas such as internal technology fairs and "decision spaces" (locations where anyone interested in a topic can meet and contribute) (Ghoshal & Bartlett, 1995). The more frequently an organization engages in actions that challenge the prevailing status quo, the more adept it is likely to become at quickly and effectively developing a counterintuitive repertoire.

Functional habits. An important juxtaposition to counterintuitive behaviors is the development of functional habits, the repetitive, over-learned routines that provide the first response to any unexpected threat. Despite unfamiliarity, the inventive responses that lead to resilience must also be efficiently developed and executed. For many organizations, the instinctive response to any threat is to metaphorically 'circle the wagons' to consolidate, erect barriers, and defend a position. Conversely, in resilient organizations the first response is to seek information, communicate, build bridges and open the system

Functional habits are closely tied to genuine organizational values. Research has shown it is the strength and authenticity of a firm's core values, rather than the specific beliefs, which separates resilient from non-resilient organizations (Collins and Porras, 1994; Coutu, 2002). A cohesive sense of what a company believes is the foundation for developing day-to-day behaviors that translate intended strategies into actions (Campbell & Yeung, 1991). If an organization develops values that lead to habits of investigation rather than assumption, collaboration rather than antagonism, and flexibility rather than rigidity, it is more likely to intuitively behave in ways that open the system and create robust responses.

The functional habits of complex adaptive systems, which are noted for their resilience, contrast dramatically from the routines of complicated but less adaptive clockwork systems (Pascale, 1991). Complex adaptive systems tend to move toward the edge of chaos when provoked by a complicated task, whereas clockwork systems react with standardized procedures. Complex adaptive systems are at risk when they are in equilibrium, so they perpetually create novel situations and new interactions. Newtonian systems tend to focus on control and protecting their core. Complex adaptive systems continually create emerging patterns through non-linear iterations thereby increasing the range and repertoire of the organization's experience and options. Non-resilient organizations tend to follow a dominant, hierarchically orchestrated routine (Meyer, 1982).

Functional habits also entail the core competencies of an organization. For example, Special Forces units overlearn the crucial skill of patrolling (Simons, 1997). Patrolling is essential for reconnaissance and attack. Patrolling alerts the team captain to any deficiencies of individual soldiers. Patrolling enables teams to rehearse coordination in uncertain situations. Finally, patrolling helps the team to bond and develop its coherent identity. Resilient

organizations rehearse their firm's equivalent of patrolling until it becomes rote and therefore a platform for other crucial competencies, behaviors, and relationships.

Behavioral preparedness. Behavioral preparedness is taking actions and making investments before they are needed to ensure that an organization is able to benefit from situations that emerge. Coutu (2002) offers a chilling example of behavioral preparedness on the part of Morgan Stanley, the investment bank that was the largest tenant in the World Trade Center prior to September 11, 2001 After the 1993 attack on the World Trade Center, Morgan Stanley drilled its employees regarding what to do in the event of a catastrophe, designated three different recovery sites where employees could congregate and conduct business following a disaster, and created numerous back-up systems. These behaviors provided the platform that enabled Morgan Stanley to enact other resilient behaviors.

Behavioral preparedness is similar to informed opportunism (Waterman, 1988) in that it links homework, agility, and chance. Certainly some organizations are luckier than others, but many organizations squander the opportunities they encounter by being too timid, or too slow, or simply unaware. Behavioral preparedness enables lucky firms to benefit from their good fortune, and it creates a set of lenses that enables an organization to spot an opportunity that other firms without their capabilities might miss.

Behavioral preparedness also means that an organization deliberately unlearns obsolete information or dysfunctional heuristics (Hammonds, 2002). As classic examples such as integrated steel mills and Swiss watch makers demonstrate, it is just as important for organizations to quickly discard behaviors that constrain them as it is for them to develop new capabilities. Firms that have not developed the necessary behaviors before they are needed jeopardize resilience because they are unable to capitalize on changes in technology, ideas, or market conditions.

Non-stop conversation. Collaborative sensemaking, constructive interdependence, self-organization, and mutual adjustment all require continuous communication (Thompson, 1967; Weick, 1993). As Thompson (1967: p. 56) explains, mutual adjustment depends upon the "transmission of new information during the process of action." Likewise, Eisenhardt (1993) found that nonstop verbal and nonverbal communication was an essential source of coordination in complex systems such as power plants and aircraft carriers. Complex situations such as responding to an emergency require organizations to ensure that three messages *always* receive attention: (1) I need to talk to you, (2) I need to listen to you, and (3) I need you to talk to me (Ginnett, 1993).

Creative and iterative processes often overwhelm organizations with an excessive range of possibilities (Iansiti, 1995). Resilient organizations generate a vast array of ideas quickly and sort through them efficiently and effectively. Both these behaviors rely on effective communication. The ability to simultaneously share understanding and take action is a hallmark of resilience. Moreover, an organization cannot predict in advance just what information or insight will be most useful for dealing with an unexpected situation. Continuous dialog provides the raw material for constructing meaning and direction in ambiguous circumstances.

Continuous conversation also builds community. Communities, as opposed to less cohesive and mutually dependent groups, are characterized by honest, intimate, informative conversations that enable relationships to go deeper than the typical organizational masks of composure (Peck, 1987). Communities provide both the motivation and the ingredients needed for self-organization, the development of virtual role systems, and the strong sense of commitment and persistence that characterize resilient organizations.

Importance of behavioral resilience. Behavioral resilience is the engine that moves an organization forward. Behavioral resilience creates outcomes that enable an organization to

learn more about the situation and about its own resources and capabilities. While cognitive resilience sets the stage for thriving despite adversity, behavioral resilience translates these thoughts and perceptions into reality.

Contextual Resilience

Contextual resilience is the setting that nurtures behaviors and attitudes that allow organization members to collaboratively respond to a discontinuous disruption in ways that create an advantageous organizational transformation. Contextual resilience provides the framework and environment for resilient activities to take place. Five factors comprise contextual resilience: (1) deep social capital, (2) co-evolution, (3) community, (4) diffused power and accountability, and (5) connections to external resource pools.

Deep social capital. In the same way that deep pockets help organizations weather financial turbulence and capitalize on unexpected opportunities, deep social capital provides the interpersonal foundation for thriving despite ambiguity and for developing rapid responses to emerging prospects. Relationships determine what work gets done and how it is accomplished. Managing relationships is the primary way to shape the patterns that determine organizational behavior in complex adaptive systems (Capra, 1996). Social capital is the goodwill available to individuals, groups and organizations that lies in the structure and content of their interpersonal relationships (Adler & Kwon, 2000). Organizational resilience requires strong social capital based on respectful interaction.

Deep social capital evolves from respectful interactions within an organizational community. Weick (1993) defines respectful interaction as face-to-face, on-going dialogue rooted in trust, honesty and self-respect. Respectful interaction builds informed and disclosure-oriented intimacy and is a key factor enabling collaborative sensemaking. This type of social capital offers a number of important benefits for developing resilient organizations (Lengnick-

Hall & Lengnick-Hall, 2002). One, it facilitates growth in intellectual capital since people are more likely and more able to share tacit information. Two, it eases resource exchange since groups come to recognize their interdependence. Three, it eases cross-functional collaboration since people appreciate perspectives that are different from their own. Four, social capital built on respectful interaction can be the foundation for exchanges that endure beyond immediate transactions and grow into mutually beneficial, multifaceted, long-term partnerships. Finally, this form of social capital can enable an organization to build bridges that cross internal and external boundaries and forge a network of support and resources.

Co-evolution. Co-evolution is an intricate network between parts of a system and its environment that ensures they change and interact in a dynamic, reciprocal, and non-linear way. Drawn from biology, co-evolution can be defined as a process in which "interdependent species evolve in an endless reciprocal cycle" and over time, because of these interactions become more hardy (Moore, 1996: 11). This is similar to Weick's (1995) concept of enacted environments in which organizational actions and relationships create many of the conditions and situations an organization encounters as it moves through time. One of the most useful properties of co-evolving ecosystems is their natural resilience stemming from multiple, parallel interactions; dynamic tensions, perpetual novelty, self-organization, and cellular structures (Capra, 1996; Pascale, 1991). As organizations become more adept at instilling complex adaptive system characteristics in their own designs, they are increasingly likely to develop the sources of natural resilience that these elements create.

Three particularly important implications emerge from co-evolution. The variety available in the organization must match or exceed the level of variety it encounters in the environment. Ashby (1956) terms this 'requisite variety.' In addition, an organization's *learn rate* (the rate at which useful feedback is received on whether or not a selected action is

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effective) must exceed its *burn rate* (the rate at which commitment to a course of action is piling up) (Ghemawat, 1991). Finally, co-evolution can be a source of competitive advantage for firms that lead economic networks to deliberately move beyond the dichotomy of either competing or cooperating (Moore, 1996). Combined, these factors suggest that diversity, openness, and a sophisticated business ecosystem are essential for fostering organizational resilience.

Community. Peck (1987) argues that a sense of community distinguishes those units that are adept at co-evolution from those that are more passive and reactive. Horne and Orr (1998) contend that a sense of community binds individuals together and enables an overlap of individual and organizational self-interest. When individuals take actions that enhance the survival and vigor of their organization, they simultaneously increase their own probability for success (Mallak, 1998b). Communities capture commitment and a sense of purpose that enables meaning to be embedded in ambiguous situations (Coutu, 2002; Mallak, 1998b). It is logical to conclude, therefore, that creating a community has both direct and indirect benefits for achieving organizational resilience.

What are the characteristics of community? Five characteristics have been found to distinguish communities from other types of social groupings (Peck, 1987). One, communities are noted for their honest, revealing, and intimate communication. Two, communities demonstrate deep relationships and commitment to the collective and to individual community members. Three, communities are embedded with reciprocal interdependence. Four, communities are able to effectively create a synthesis of individualism and collectivism in which both factors are maintained rather than diluted. Five, communities balance and integrate their technical and social systems without letting either dominate design choices. Community provides the boundaries and the sense of integrity that unites and distinguishes an organization within its ecosystem.

Diffused power and accountability. Resilient organizations are not managed hierarchically. Instead, they rely on self-organization, diffuse influence, individual and group accountability and similar factors that create what Morgan (1997) terms a 'holographic' structure. In holographic structures, each part is a fractional replica of the whole organization. This creates networked intelligence and permits structures that can reproduce themselves. Holographic structures contain systematic redundancy in both information processing and crucial skills to enhance flexibility. Holographic structures match internal complexity with external complexity enabling the organization to achieve requisite variety. Holographic structures are not over designed. They use the minimum specifications possible to ensure collaboration, but leave freedom for experimentation and self-organization. Finally, holographic structures are designed to learn and to change their behaviors based on new insights and information.

The importance of these characteristics is reiterated in observations of resilient organizations. Resilient organizations, like the Ritz-Carlton hotels and McGuffy's restaurants, share decision-making widely (Mallak, 1998b). Every employee has both the discretion and the responsibility for ensuring that organizational interests are attained in large and small ways. The fractal qualities of holographic designs coupled with networked intelligence, facilitates the development of virtual role systems, non-stop conversation, and collective sensemaking. A persistent tension between individual interests and collaborative interests stimulates initiative, and entrepreneurial orientation, and resourceful actions. Redundancy can be used to promote functional habits and ensure required behavioral preparedness. Overall, shared responsibility coupled with interdependence creates a setting that facilitates cognitive and behavioral resilience.

Exceptional resource suppliers. In the study of Hawaiian children, one of the noteworthy features that distinguished resilient individuals was their ability for forge relationships with others who could share key resources (Werner & Smith, 2001). Coutu (2002)

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reached a similar conclusion based on research into inner-city youths. These, and other studies suggest that resilient people have an unusual ability to get others to help them out which is often rooted in some visible talent (i.e., athletic ability) or interpersonal skill (i.e., inviting personality). A similar phenomenon seems reasonable to project at the organizational level. Firms that make highly visible contributions (i.e., Center for Disease Control), occupy crucial positions in the economy (i.e., Boeing), or are viewed foundations for the ecosystem (i.e. agriculture) are able to obtain resources, concessions, and assistance that other organizations are denied.

These resources aid resilience in several ways. The ability to obtain resources externally ensures some measure of continuous slack. Continuous slack has been found to be more significant than resource abundance in increasing innovation and resourcefulness (Judge, Fryxell, & Dooley, 1997.) In addition, external resources are likely to introduce variety and diversity into an organization. This, in turn, stimulates innovation and challenges prevailing assumptions in ways that can cultivate wisdom. Diversity and variety are also prerequisites for learned resourcefulness. External resources also ensure that bonds with various environmental agents are maintained. These links facilitate co-evolution by increasing mutual dependence.

Importance of contextual resilience. Contextual resilience provides the operational platform from which resilient behaviors and attitudes are developed. While contextual resilience is not sufficient to create organizational resilience, it is an integral ingredient enabling the kinds of behaviors and mental models that lead to resilience. Moreover, contextual resilience provides the necessary medium for integrating the other two dimensions of organizational resilience. Without the conduit of relationships, processes, and intangible assets generated by contextual resilience, there would be few ways to synthesize resilient cognitions and behaviors into an enterprise-wide capability. Contextual resilience is the primary means for transforming individual capabilities into an organizational competency.

INTEGRATING THE COMPONENTS

As can be seen in Figure 1, the various model components are not independent. Cognitive resilience, behavioral resilience, and contextual resilience are all component dimensions that comprise organizational resilience. Each of these dimensions provides some important prerequisite ingredients for the other dimensions. In addition, these dimensions operate synergistically, creating a mutually reinforcing web of interactions. One implication, therefore, is that all three elements are necessary and none is sufficient by itself to enable organizational resilience.

Within each of the three major component dimensions, the specific factors are likely to reflect firm-specific characteristics. We suspect that while a threshold level of constructive sensemaking is necessary to create cognitive resilience, for example, the absolute magnitude of this factor could, and probably should, vary from firm to firm to reflect unique contingencies. This perspective is consistent with the vision of organizational resilience as pattern, with the concept of equifinality, and with the basic premises of the resource based view of organizations.

To complete the model it is necessary to discuss antecedents and consequences of organizational resilience. Two types of antecedent factors are proposed to foster the component dimensions of organizational resilience: contributory assets and developmental experiences. The beneficial consequences of organizational resilience take many forms. Four of the most significant are assertive momentum, turning adversity to advantage, agility, and increased success with innovation. Over time, it is expected that organizational resilience initiates a virtuous cycle of positive reinforcement through feedback. As an organization benefits from its momentum, enhanced competitiveness, agility and innovativeness, it becomes more open to the risks that perpetuate the need for resilience. In addition, greater knowledge and new capabilities

are important by-products of organizational resilience. These, in turn, increase an organization's potential for building even richer networks of relationships with others who desire these assets.

Crucial Antecedents

Mediocre organizations are unlikely to be resilient. Learned organizational confidence can only realistically accrue in firms that have established their effectiveness and this requires competencies, unique assets, and strategic capabilities. In addition, if an organization is unable to create substantial value, it is unlikely to be able to attract assistance and resources from outside sources. Just as attractive talents enhance individual network connections, significant assets and capabilities enhance an organization's position.

Developmental experiences also appear to play a key role in creating resilience. Moore (1996) offers an interesting biological metaphor that illustrates this point. He contrasts Costa Rica and Hawaii in terms of the resilience of their respective ecosystems. While both have very similar source biology, they developed into profoundly different types of systems. Hawaiian plants and animals have evolved into exotic and fragile systems whereas the plants and animals of Costa Rica are vigorous and tenacious. A primary factor that accounts for this difference is that Hawaii is relatively isolated, so its biological systems are buffered from problems and predators. Costa Rica, in contrast, is a land bridge experiencing relentless threats to survival.

Similarly, individuals noted for resilience typically experienced challenging and difficult periods throughout their lives (Coutu, 2002). Therefore, it seems reasonable to predict that an experience of overcoming just-manageable threats provides training in resilient behaviors and sets the stage for cognitive resilient perspectives. Organizations that experience periodic hardship or episodic crisis appear more likely to develop organizational resilience than those which experience smooth sailing.

Beneficial Consequences

The proposed definition of organizational resilience frames the kind of benefits that can be expected. Robust organizations are effective transformation systems. They are able to take advantage of whatever happens so that they learn from their experience and develop new capabilities as a result of their enhanced knowledge and exposure. As capabilities are enhanced, organizations are more able and more likely to assert their influence on their environments. They become more agile, because they have a broad repertoire of potential actions, and they become more confident in their ability to shape their destiny. Together these factors allow an organization to establish momentum and set the initiative in its competitive arena. In addition, the characteristics of diversity, resourcefulness, flexibility, behavioral preparedness and so forth that promote resilience also increase a firm's innovativeness. Resilient organizations are creative whether or not a crisis is driving their inventiveness.

IMPLICATIONS FOR FUTURE RESEARCH

The most obvious first step in a research agenda is to begin empirically testing the elements and relationships presented in Figure 1 in order to move beyond anecdotal support for proposed aspects of the model. Beyond verification of these parts and relationships, several underlying research questions are important to answer.

The model incorporates a number of assumptions that raise interesting research questions. First, it is assumed that individual resilience and organizational resilience are neither additive nor isomorphic. Is a critical mass of resilient individuals necessary for organizational resilience? Moore (1996) describes critical mass as the point at which a pattern becomes self-sustaining, scalable, and replicable. To better understand the interplay between individual and organizational resilience it is important to be able to measure when cognitive resilience, behavioral resilience, and contextual resilience reach critical mass. Can experienced

organizational resilience develop individual resilience? Alternatively, are there circumstances when an abundance of resilient individuals inhibit organizational resilience? Horne and Orr (1998) suggest that too many resilient individuals may lead to renegade responses that undermine effective organizational resilience.

Second, none of the three component dimensions is assumed to be sufficient to create organizational resilience. Likewise, each of the component dimensions is assumed to be necessary to promote organizational resilience. It is important to resolve exactly how cognitive resilience, behavioral resilience, and contextual resilience interact and whether there are circumstances under which these interactions might create negative synergy.

Third, occasional hardships are expected to enhance resilience, but the threshold of this assumption is unclear. In other words, the boundary conditions of hardship need to be established. What magnitude of difficulty makes this experience corrosive rather than contributing to resilience?

Fourth, the backdrop for this discussion of organizational resilience has been unexpected adversity. However, unanticipated success can be a root source of potential disaster as well. Consider, for example, the situation faced by Berlix Laboratories, a subsidiary of Schering, AG, when in 1993 its new pharmaceutical compound Betaseron® received approval from the FDA much more quickly than anticipated. The demand for Betaseron® was estimated to be approximately 100,000 of the individuals with multiple sclerosis; yet manufacturing capabilities could only produce enough for about 20,000 patients. U. S. flag manufacturers faced a similar dilemma shortly after September 11, 2001 when orders far exceeded their material supplies and manufacturing capabilities. In both situations, resilient responses were needed to prevent short-term responsiveness from undermining long-term competitiveness.
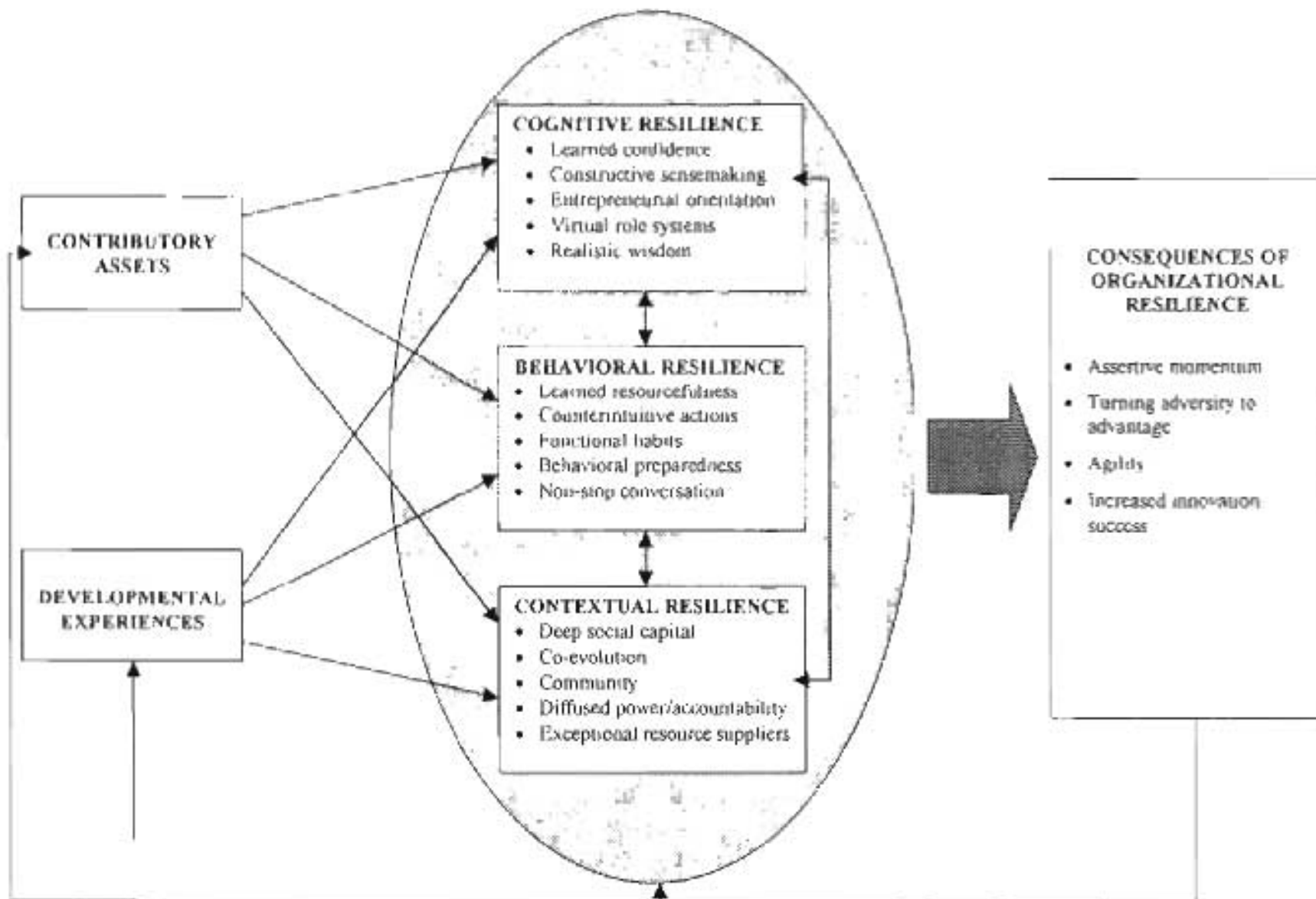
Finally, since organizational resilience is a response to a disruptive event, how long is the waiting period for determining whether or not organizational resilience has emerged? Clearly, organizations that have developed cognitive resilience, behavioral resilience, and contextual resilience before encountering the event would be expected to be more resilient than firms that have not nurtured these capabilities. Yet, since organizational resilience is a transformational capability, some passage of time is necessary to determine whether or not a transformation, rather than an episodic response, has taken place. The time horizon for measuring organizational resilience should be sufficiently long that sustainability has been demonstrated.

The knowledge economy virtually guarantees that any organization will find itself having to deal with unpleasant surprises and challenges to its viability. A better understanding of organizational resilience offers a constructive means to enhance organization performance as a consequence of this inevitable uncertainty.

Table 1
Definitions of Organizational Resilience

TERM	DEFINITION	SOURCE
Resilience	The opposite of vulnerability.	Aitken, 1999
Resilience	The skill and the capacity to be robust under conditions of enormous stress and change.	Coutu, 2002
Resilient organization	Design and implementation of positive adaptive behaviors that are quickly matched to the immediate situation.	Guidimann, 2002
Organizational resilience	The ability of a system to withstand the stresses of environmental "loading" based on the combination of the system pieces, their structural interlinkages, and the way in which environmental change is transmitted and spread throughout the entire system.	Horne, 1997
Resilience	The ability to absorb change with a minimum of disruption.	Horne & Orr, 1998
Resilience	Thriving in the face of adversity.	Kanigel, 2001
Resilience	To help meet customer needs on the spot, capture opportunities that may otherwise be lost, and avert catastrophes by acting quickly and effectively in crisis situations.	Mallak, 1998a
Organizational resilience	Design and implementation of positive adaptive behaviors that are quickly matched to the immediate situation.	Mallak, 1998b
Resilience	Robustness and the ability to repel challenges. The ability to develop impenetrable toughness and rebound after catastrophes.	Moore, 1996
Resilient organization	Able to sustain competitive advantage over time through its capability to both deliver excellent performance against current goals and effectively innovate and adapt to rapid, turbulent changes in markets and technologies.	Robb, 2000
Resiliency	Ability to recover quickly from misfortune; able to return to original form after being bent, compressed, or stretched out of shape. A human ability to recover quickly from disruptive change, illness, or misfortune without being overwhelmed or acting in dysfunctional ways.	Seibert, 2002
Resilience	Intelligent reaction and improvisation. To be mindful about errors that have already occurred and to correct them before they worsen and cause more serious harm.	Weick & Sutcliff, 2001

Figure 1: A Model of Organizational Resilience

COGNITIVE RESILIENCE
- Learned confidence
- Constructive sensemaking
- Entrepreneurial orientation
- Virtual role systems
- Realistic wisdom

BEHAVIORAL RESILIENCE
- Learned resourcefulness
- Counterintuitive actions
- Functional habits
- Behavioral preparedness
- Non-stop conversation

CONTEXTUAL RESILIENCE
- Deep social capital
- Co-evolution
- Community
- Diffused power/accountability
- Exceptional resource suppliers

CONTRIBUTORY ASSETS

DEVELOPMENTAL EXPERIENCES

CONSEQUENCES OF ORGANIZATIONAL RESILIENCE
- Assertive momentum
- Turning adversity to advantage
- Agility
- Increased innovation success

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