Experiencing the Improbable: Rare Events and Organizational Learning

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Organizations that go through rare and unusual events, whether they are costly or beneficial, face the challenge of interpreting and learning from these experiences. Although research suggests that organizations respond to this challenge in a variety of ways, we lack a framework for comparing and analyzing how organizational learning is affected by rare events. This paper develops such a framework. We begin by first outlining two views of rare events. The first view defines rare events as probability estimates, usually calculated from the frequency of the event. The second view defines rare events as opportunities for unique sensemaking based on the enacted salience of specific features of the rare events. We next use these definitions to explore how rare events trigger learning, and then examine the kind of learning processes that are triggered by rare events. We conclude with a discussion of promising areas of research on learning from rare events.

Key words: rare events; organizational learning; learning triggers; learning processes

Before the September 11, 2001, attack, there was the February 26, 1993, attack on New York’s World Trade Center. Before the 2008 subprime U.S. mortgage crisis, there was the 1988 savings and loan crisis. Whether rare events are costly or beneficial, looking back we are often surprised at the failure of organizations to draw appropriate lessons. What is true for organizations also applies to society at large. Rare events can change our lives, but even when they do not affect us directly, they attract our attention—indeed it is not far fetched to say that they fascinate us. But this fascination does not often translate into systematic study and analysis of how rare events influence organizational thinking and subsequent actions.

To some extent, this is due to the methodological difficulties of using standard tools to study rare events (Meyer 1982). At another level, however, the neglect is due to a widespread assumption that organizational change is the product of continuous processes. Rare events are often set aside as statistical outliers, or treated as accidental manifestations of underlying organizational processes. This perception relegates organizational learning from rare events to the margin of mainstream research on organizational learning, denying it the possibility of being a mainstream area of research in its own right.

This Organization Science special issue seeks to redress this neglect. Our initial challenge as special editors was to frame a call that will broadly sketch what we mean by “learning from rare events” without precluding other views on the same process. The diversity of submissions that we received more than met our expectations in this regard, but it also made our task of balancing focus against diversity much harder. On the positive side, the reviewing and editing process expanded and deepened our own understanding of what is meant by “learning from rare events.” When we turned our attention to writing this essay, we were mindful of this evolution.

The task of the opening essay is to summarize the topic using primarily, but not exclusively, the papers selected for publication. When a topic is well established, the editors can use existing conceptual frameworks to describe the papers and analyze their contributions. But when the topic is relatively new, as is the case here, the editors have the added task of creating such a framework. Not surprisingly, the insights and ideas of the papers we reviewed informed the framework that emerged. For this reason, descriptions of the papers are woven into our discussion of rare events and organizational learning.

Unexpectedly, the events that were transforming the economic landscape while we were reviewing and preparing this special issue for publication also informed our thinking. It was difficult to think about learning from rare events without considering why decision makers failed to learn from past economic crises, and what current research tells us they will learn from this one. Having said this, we were also mindful that, notwithstanding the current business climate, rare events can also be pos-
We begin by focusing on how rare events are defined. We argue that there are no “rare events” as such; rare events can only be defined in a particular context. In other words, the position of the observer or participant can be crucial in distinguishing what is defined as rare from what is not defined as rare. Events are more likely to be considered “rare” when individuals or organizations that observe or directly experience these events see them as unusual—in the sense that they depart from ordinary experience with the same type of event, or are unique in the sense of having no close parallel. This in turn points to the fact that events are only rare relative to specific decision makers or organizations. Put differently, the same event can be rare for one organization but commonplace for another.

We then turn our attention in the next two sections to the main subject of this special issue: How do organizations learn from rare events? We begin to tackle this issue by focusing on how rare events trigger learning, arguing that different types of rare events will tend to influence how organizations learn and what they learn. Next, we turn from a focus on rare events as triggers of learning to the multiple learning processes that are triggered by rare events.

If the primary task of a special issue is to provide a focus for existing research on a particular topic, arguably its other task is to suggest how to build upon this research. With this in mind, we conclude our special issue with some directions for future research.

### Classification of Rare Events

“Rare events,” write Harding et al. (2002, p. 176), are “of interest to social scientists because they are of great concern to the public.” But public perception of rare events and a definition that is scientifically workable often seem far apart. The public tends to construct rare events through specific incidents, such as the Challenger space shuttle explosion, the collapse of ENRON, or the latest megamerger that captured newspapers’ headlines. There is no systemic thinking that goes into defining these incidents as “rare,” but a denotative process that captures the essence of the term by pointing to widely reported examples in the community or the media.

This stands in marked contrast with systematic effort to collect data on specific classes of events, usually by organizations charged with monitoring economic affairs or public safety. The data are transformed into probability estimates that permit informed judgment of what is “rare,” and what is not, only retrospectively, but also prospectively in the anticipated future. For example, the paper by Madsen (2009) shows how data collected by the U.S. Mine Safety and Health Administration (MSHA) is used to calculate the probability of a fatal accident in the average U.S. coal mine as once every 250 years. Fatal coal mining accidents are therefore rare events, not because MSHA defines it as such, but because conventional understanding of probabilities points toward this conclusion.

Probabilistic and nonprobabilistic salience-based views of rare events coexist. Organizations may focus on rare events because probability estimates suggest that they are likely to recur, or may ignore them because probability estimates suggest that they are unlikely to pose a threat or opportunity. In other instances, however, probability estimates will have no bearing on the attention paid to rare events. Organizations will focus on rare events because they contain useful lessons, regardless of probability estimates.

Judgment of which view dominates thinking cannot be separated from the particular place and time where the event is experienced. As we discuss below, depending on circumstances in some instances, organizations rely primarily on frequency to define rare events, and in others rare events are enacted through focused sensemaking.

### Rare Events as Probability Estimate

The simplest process that organizations use to construct rare events is by contrasting rare with nonrare events using a probability estimate to demarcate one from the other. For example, U.S. Secretary of the Treasury Paulson reached for a well-known probability benchmark when he called the credit crunch of 2008 a “once in a hundred-year event” (New York Times 2008). This judgment is supported by a study by Bordo et al. (2001). They analyzed data on banking crises in 26 industrialized countries over the past 150 years to conclude that, on average, a country has a 1 in 50 probability of a major banking crisis.

Another way of stating the finding by Bordo et al. (2001) is to say that industrialized countries in the sample have a 2% probability of experiencing a banking failure. Though this comes close to Paulson’s view that our current banking crisis is a one-in-100-years event, concluding that banking crises are rare events depends on the assumed underlying probability distribution that generates crises. In a normal distribution, events that are more than five standard deviations from the mean are generally considered as rare. But for “power-law” distributions that have a “fat” or “heavy” tail (i.e., have a large kurtosis), the same rule of thumb does not hold. For instance, Aidt et al. (2006) show that the tenure of managers in the English football league from 1874 to 2005 follows a power law, with an average tenure of 3.6 years and a standard deviation of 4.6 years. Tenures of 20 or more years are therefore far more likely than it would be under a normal distribution. What is rare under a normal distribution may therefore not be considered rare under a power-law distribution.
Several of the papers in this special issue, specifically the papers by Madsen (2009), Rerup (2009), and Zollo (2009) suggest that rare events are defined by probability estimates, and for this reason learning from such events is driven by the desire to decrease their occurrence. Madsen, for example, defines learning from rare events as a “decrease in the likelihood that an organization will experience a disaster in the future,” a view that adheres closely to such estimates. Rerup similarly states that firms should try to identify and analyze events that can be considered to be rare to develop organizational routines that can prevent these events from recurring.

Efforts at prevention, however, are often contingent on the event being judged as likely to recur, and on building an understanding of the causes of the rare event. The two are clearly related. Organizations are more likely to invest in learning the causes of rare events that are seen as likely to occur. Zollo’s (2009) paper, for example, shows how organizations shift attention from dealing with rare events as they occur to the accumulating knowledge about the causal relationship between actions and outcomes of rare events. Here organizations bet on acquisitions as rare events, fully aware that some will be profitable and others will not, but intend on using knowledge accumulated to improve the odds.

**Rare Events as Enacted Salience**

Probability estimates of rare events attempt to define quantitatively what for most individuals and organizations is a qualitative distinction between ordinary and extraordinary events. As Madsen (2009) describes in his paper, when 12 miners died in a West Virginia mines in January 2006, the public, the media, and government officials described the event as a “disaster.” Labels such as “disasters” and “catastrophes” can be defined quantitatively. The insurance company Swiss Re defines “natural catastrophe” as an event that causes a minimum of 20 deaths, 50 injuries, and 2,000 homeless, and/or damage in excess of $85 million (Swiss Re 2009, p. 40). But such probability estimates usually fail to capture the emotional, social, and larger correlates of rare events. For many, if not most, individuals and organizations, a rare event is a unique experience in a class of its own.

This tends to increase focus on salient features of rare events, a process that research suggests owes much to the allocation organizational attention. Theories of organizational attention posit that individuals and organizations have limited ability for dealing with diverse stimuli (Weick and Sutcliffe 2006). To mitigate these limits, they focus attention on a limited set of issues and problems, which is driven by what is salient for the organization. Events are therefore not identified, scanned, and analyzed, but enacted through their salience (Weick and Sutcliffe 2006). As Hoffman and Ocasio (2001, p. 415) note, “attention is driven not by the objective characteristics of the situation or event, but by its enactment in the environment (emphasis in the original).” This enactment represents a combination of sensemaking and sensegiving: Decision makers interpret events, and then exert influence on how others interpret those events (Gioia and Chittipeddi 1991).

The process of enactment, suggests Weick (1969, p. 243), leads managers to “construct, rearrange, single out, and demolish many of the objective features of their surroundings.” Enactment of rare events is therefore a process whereby the organization focuses on the unique and unusual features of the event. In the process, it lends the event special significance within the history of the organization or within the history of the industry more generally. For instance, firms that regularly acquire new businesses may come to see a particular acquisition as rare, either because it was much larger than previous acquisitions, or because it took place in a new country or industry. In other words, the criteria that lead the firm to see a particular acquisition as rare will not be based primarily on comparison and analysis, but on the strategic salience of the acquisition.

Papers in this issue by Beck and Plowman (2009) and by Christianson et al. (2009) draw heavily on this particular view of a rare event to explore organizational learning. According to Beck and Plowman, the enacted salience of a rare event is increased when organizations actively explore the meaning of the event as it occurs, often by asking questions such as, “What does this event mean today? What will it mean tomorrow? What does the organization’s response mean? How does the organization’s response change what we believe?” Answers to these questions emerge from a multistage interpretative process in which earlier explanations of activities are elaborated and amended in light of new information. In effect, Beck and Plowman argue that organizations should learn by experiencing a single event “richly” (March et al. 1991), regardless of any estimates of how frequently the event recurs.

Christianson et al. (2009) go even further in their paper. They argue that “learning from rare events” as defined in the call for this special issue ignores learning “through rare events”: the process of making sense and understanding what the rare events tells the organization about its leadership, culture, and capabilities. Learning through rare events, organizations therefore shift the focus entirely to the enacted salience of the rare event as a unique experience with no reference to any estimates of probability that the event will recur.

**Combining Probability Estimates and Enacted Salience Views of Rare Events.** The papers in this special issue generally base their discussion of learning from rare events on either probability estimate or enacted salience views of rare events, but not both. At first sight, the choice of one view to the exclusion of the other seems logical: they belong to different and, many would argue,
irreconcilable epistemologies. Defining rare events as probability estimates is firmly rooted in a realist perspective that sees social phenomenon as objectively verifiable and subject to testable cause and effect relationships. The enacted salience view of rare events, on the other hand, is constructionist, an expression of constructionist epistemology that, in the words of Moldoveanu and Baum (2002, p. 738), believes in an “interpretative, creative and idiosyncratic element in human behavior that is irreducible to the set of causal laws that form the preferred explananda of natural scientists.”

A theory of learning from rare events that combines both of these perspectives appears difficult for epistemological and methodological reasons. But a more careful consideration of the social and organizational processes that generate probability estimates and drive enacted salience would suggest that the two interact and influence each other in practice. Specifically, probability estimates depend on categorization of events, and categorization is a social and organizational process that is often shaped by enacted salience. For example, in 1942, RCA Records decided to honor Glen Miller and his band for their best-selling “Chattanooga Choo Choo” with a solid gold copy of the record (Grudens 2004). This unprecedented tribute was subsequently institutionalized in 1958 by the Recording Industry Association of America (RIAA), the trade association of America’s record companies, as the Gold Record Award for record sales of more than 500,000. Thus, the enacted salience of the award given to Glen Miller led to the formation of an institutionalized category that in turn allows for probability estimates of the likelihood that a record will achieve this level of sales.

The subsequent introduction of Platinum and then Diamond Awards by the RIAA focused attention on records that sell more than 1 million and 10 million units, respectively. But the RIAA used the American market as the benchmark. The International Federation of the Phonographic Industry, on the other hand, sought a prize that would adjust for global sales. In 2001 it created the Chopard Diamond Music Award for artists that achieve record sales of more than 100 million units. Increasing the scale 10-fold reduced significantly the probability that an artist would receive this award, but also increased the enacted salience of the achievement.

The interaction of rare events as estimated probability and enacted salience is therefore evolutionary: Probability estimates often depend on categories that are created as a result of the enacted salience of specific rare events, and vice versa, certain rare events become highly salient because of an existing category. This tends to have organizational consequences. Organizations often adjust their structure to reflect events that are rare but have high salience, and the new structures that emerge, for example, units for handling acquisitions, focus attention on the salience of specific features of the events, which in turn often leads to formation of categories that highlight certain events as probabilistically rare (Weick et al. 2005). Ultimately, therefore, whether we see rare events as probability estimates or as enacted salience depends on whether we consider classification or sensemaking as the dominant process. Because both coexist in organizations, in practice the two views are complementary rather than mutually exclusive. But this complementarity is more easily observed and studied over the long, rather than the short run.

**Rare Events as Triggers of Learning**

In 1969, Columbia Pictures released a low-budget road movie produced, written, and directed by Peter Fonda and Dennis Hopper who were virtually unknown at the time. The movie, *Easy Rider*, generated $60 million at the box office, providing reasonably healthy returns on costs. More significantly, the script and unusual filming style had extraordinary influence on filmmaking and business decisions in the years that followed. It became, in the words of the critic Leonard Maltin, “a landmark that changed the art of moviemaking” (quoted in Fisher 2004).

Thirty years later, Artisan Entertainment released *The Blair Witch Project*, a low-budget horror movie shot by film students that went on to gross close to $250 million worldwide, making it the most profitable movie in history. As Lyons and Gray (1999, p. 7) note, some Hollywood studios saw the film “as a phenomenon that will revolutionize marketing and distribution; others [saw] it as a fluke, a happy confluence of word-of-mouth and grassroots appeal.” But ultimately, as Lyman (1999, p. 1) reports, the industry concluded that the film was a “more of a quirky tremor than a tectonic shift.” There was little learning to be had from *The Blair Witch Project* notwithstanding the attention the film triggered. Thus, although both *Easy Rider* and *The Blair Witch Project* were rare events, only the first triggered learning that exerted significant influence on the future direction of the motion picture industry.

This comparison shows that rare events that are very similar can generate very different lessons for organizations. This can happen because, although rare events can be similar, they often vary along dimensions that have disproportionate influence on organizational learning. The papers in this special issue point to two characteristics of rare events that play a pivotal role in triggering learning. First, the potential impact of a rare event on the organization or its environment drives the learning processes that follow. Second, the potential relevance of the rare event for a particular organization will exert a strong influence on the magnitude and scope of subsequent learning.

How organizations experience and perceive the impact of rare events will influence their willingness to translate actual and potential consequences of rare events
Transformative Rare Events

Rare events that combine a major impact on the organization with a strong match with significant organizational concerns will tend to produce transformative learning. Schein (1972) argues that transformative change begins with unfreezing events: critical incidents that create data that suggest that organizational goals are not being met. This in turn creates cognitive and political disequilibrium that leads to a period of restructuring, and subsequently to entrenchment of new practices.

Transformative rare events do not necessarily change the organization for the better. There is a marked tendency in organizations to take the lessons of transformative rare events beyond what the experience itself would suggest. Thus, as Zollo’s (2009) paper suggests, successful acquisitions that transform the strategic position of the organization often lead to overconfidence and greater risk taking, often to the detriment of the organization. On the other hand, transformative rare events that pose a threat to the organization may produce the very opposite: excessive caution that impacts the ability of the organization to innovate and change.

In their paper for this issue on the Baltimore and Ohio Railroad Museum Roundhouse, Christianson et al. (2009) show how a totally unexpected event, the collapse of a roof, “unfroze” established patterns and transformed the museum’s organization and strategy. At one level, the crisis threatened the existence of the museum, and thus triggered actions that became part of the historical memory that strengthened organizational identity. But at another level, the crisis also constituted a major “interruption” that disrupted and reshaped organizational routines. Although taking action to save the museum was the immediate concern of management, the experience also tested the museum’s weaknesses and strengths, and produced skills that transformed the museum as an effective organization.

Reinterpretative Rare Event

Rare events that may have a low impact on the organization but do touch on fundamental organizational concerns often lead to reinterpretative learning. For example, near misses have almost no impact, but nevertheless, focusing attention on serious consequences initiates analysis that touches on many aspects of the organization. Similarly, accidents that have small but measurable impact can also trigger learning and deliver important lessons (Haunschild and Sullivan 2002). As Madsen (2009) suggests in his paper, the occurrence of minor accidents in coal mines reminds “organizational participants of the hazards inherent in their work and organizational participants respond by adjusting their individual mental safety models.” Rare events that have low impact can also trigger learning that points toward opportunities, not only problems. In his paper, Starbuck (2009) recounts how a one-time unusual request by a client for weekend legal work led a small New York City law firm to offer legal services on a 24-hour/7-day basis.

Reinterpretative rare events are sometimes rare events with a major impact that are attenuated by indirect observation. Thus, the consequences of major accidents can influence the thinking of organizations that are not in any way involved. Kunreuther and Meszaros (1997) examine the responses of three chemical companies to the Bhopal accident. They describe managers in these companies engaging in what Madsen (2009), in his paper for this issue, describes as “vicarious learning”: learning that uses the experience of other organizations to indirectly infer lessons (see also Haunschild and Sullivan 2002, Baum and Dahlin 2007). The impact, mostly in terms
of more regulations and higher insurance premiums on the organizations that were not involved in Bhopal, was relatively negligible, but the implications for their operations were analyzed and internalized (Gallarotti 1995).

**Focusing Rare Events**

Rare events that have, or are expected to have, high impact on the organization but whose relevance is selective, focuses learning on specific issues and problems. The 2004 Indian Ocean tsunami that caused more than 200,000 casualties led governments to invest in early warning systems. Similarly, blockbuster movies often trigger reflection and analysis that is then used to plan sequels. But the learning is narrow, confined primarily to retaining as much of the original creative team and cast as possible, and varying but not fundamentally altering the winning plot.

Several of the papers in this special issue explore how rare events focus learning. In his article, Rerup (2009) points out that impact magnitude correlates with event vividness, which in turn focuses managerial attention on certain aspects of the event at the expense of others. Similarly, Madsen (2009) notes that major accidents often trigger investigations that focus primarily on proximate causes and derive lessons that address prevention. Finally, Zollo’s (2009) paper shows that rare events that have a strong positive impact, for example, major acquisitions, trigger learning that attempts to replicate favorable performance. In general, learning from focusing rare events is concentrated primarily on prediction and amelioration of consequences when the event has a negative impact, and on replication when the event has positive impact.

**Transitory Rare Events**

Rare events that may have a low impact upon the organization and also touch upon peripheral organizational concerns are usually regarded as transitory from a learning perspective. The incentives to learn from transitory rare events are therefore very limited, and are usually confined to estimating the duration of the event when the impact is negative, and taking advantage of the benefits while they last when positive. Kaufman (2008) points out that there were about a dozen financial crises since World War II. Learning from these crises was limited precisely because the “aftermath of each was transitory.” As markets rebounded, firms wrote off the crisis as a rare cyclical downturn that must be endured rather than understood.

These transitory crises, however, can often result in “superstitious learning” where organizational members believe that their decisions drive observed outcomes when in reality the assumed relationship is spurious. Zollo’s (2009) paper in this issue deals with such forms of learning in which the “connections between actions and outcomes are misspecified.” More specifically, his paper shows that a relatively narrow analysis of underlying causes produces overconfidence in the resulting learning that can distort prudent decision making.

**Processes of Learning from Rare Events**

Rare events occupy an ambiguous position in the literature on organizational learning. Normative decision-making literature suggests that the small sample characteristics of rare event results can produce erroneous inferences (Risen and Gilovich 2007). In other words, systematic analysis of past rare events can lead to actions that are more risky than if the past is ignored altogether. Other researchers, such as Carley and Harrald (1997), suggest that although in theory learning from rare events sounds promising, in practice, this type of event defies organizational planning processes that are routinely used in organizations.

The papers in this special issue, however, suggest that organization learning is not a single but a multiple set of processes with different outcomes. Broadly speaking, the papers describe four types processes of learning associated with rare events. These are outlined below.

**Learning About Rare Events**

A focus on the consequences or the outcomes of specific kinds of rare events (e.g., accidents, acquisitions, headquarters relocations) triggers learning processes that are primarily concerned with building knowledge about how to manage these rare events. As Christianson et al. (2009) put it in their paper for this issue, “Learning associated with rare events occurs separate from the event, after the event, and is subject to the simplification of hindsight.” In this context, organizations learn about rare events because they wish to improve outcomes associated with these rare events. Learning about rare events therefore consists of learning to identify the rare event as belonging to a category of similar events, and then analyzing the processes that regulate how these events unfold. This analysis is sometimes pursued with the intention of producing a detailed map of these processes, or it can take the form of learning via exploration and experimentation that meet stipulated performance criteria without careful analysis of underlying causes.

Madsen’s (2009) paper in this issue similarly shows how government collection of coal mining accident data is used to derive safety lessons that are then widely disseminated. The process of aggregating rare coal mining accidents in clearly defined categories facilitates detection of hidden safety problems, but it also allows monitoring of what Madsen terms “vicarious learning”: the degree to which mining operators indirectly learn from the experience of others in the industry.

Zollo’s (2009) paper, on the other hand, focuses on how organizations learn from their own acquisition experience, rather than that of others. For individual organizations, acquisitions are good examples of rare events:
they are strategic moves that stand apart from other organizational activities, and at least in principle, are expected to have well defined performance outcomes. Zollo argues that, contrary to normative learning theory, organizations do not seek performance improvements by careful analysis of past acquisition experience, but rely on selective performance criteria and subjective interpretations to derive success factors. The result is “superstitious learning”: excessive confidence in the organization’s ability to make successful acquisitions notwithstanding the lack of reliable knowledge about the acquisition process.

Learning Through Rare Events
Lessons about their skills and capabilities that organizations acquire during rare events are valuable even if the events are not expected to recur. Learning through rare events consists of capturing these lessons and then using them to improve skills and expand capabilities. Kim et al. (2009), for example, refer to the efforts of an organization to learn from periods of exceptional performance. It is a form of organization “self-learning” that yields rich insights precisely because nonroutine events expose strengths and weaknesses that are hidden from view during normal operations. It therefore depends on sensitivity to the byproducts of managing rare events, a recognition that rare events can generate insights that have wider relevance to the organization. The Challenger disaster, for instance, revealed key problems about the relationship between NASA and its subcontractors.

Rerup’s (2009) paper in this issue shows how by inviting a team of retired U.S. Food and Drug Administration inspectors to conduct a “mock audit” of its operations, Novo Nordisk initiated a process that focused first on quality problems but then broadened into a wider investigation of the organization as a whole. As one of the managers put it: “We realized very quickly that our quality problems were not confined to this department, or to manufacturing for that matter. It was the entire firm.” The realization process, and the actions that followed, represented learning through the audit as a rare event that was originally focused on quality problems.

Christianson et al. (2009) similarly show how the significance of the collapse of the roof of the Baltimore and Ohio Museum Roundhouse went beyond the practical issues that inevitably arose as the museum worked to resume operations. The collapse of the roof was a “brutal audit” that challenged and eventually transformed the identity of the organization from a traditional museum to a tour attraction. They argue that under normal circumstances organizational identity is protected by routines that affirm activities that support this identity, and others that curtail activities that are at odds with how the organization sees itself. Rare events disrupt the relative power of these routines, allowing the organization to “learn more about itself, its environment, and its relationship to its environment.”

The contrast between Novo Nordisk, where the organization learned both about and through quality problems, and the B&O Railroad Museum experience highlights the value of learning through rare events: The collapse of the roof was a one-time event that resulted in better understanding of the engineering and management problems required to rebuilding damaged structures. But such knowledge is clearly peripheral to the activities of a museum when compared to the learning gained as a result of the experience.

Deliberate Learning from Rare Events
Many organizations see rare events as learning opportunities that must be pursued deliberately and systematically (Zollo and Winter 2002). For example, Kale and Singh (2007) note that firms sometimes transform alliance experience into codified “best practices” under such a rubric as “35 rules of thumb” or “40 decision-making templates” for managing alliances. More generally, research suggests that organizations that undertake major strategic decisions such as joint ventures and acquisitions often follow these up by systematic attempts to analyze past experience and codify this experience into knowledge that can be used in the future (Zander and Kogut 1995, Winter and Szulanski 2001, Zollo and Reuer 2009).

The impetus for deliberate learning has its origins in the unusually high levels of attention that rare events tend to command. As Rerup (2009) notes in his paper for this issue, rare events force organizations to reallocate managerial resources away from routine activities to issues that require additional attention. All too often the reallocation is used solely to manage the rare event, but at other times it is also to be invested in deriving lessons that can be used to improve organizational response to future rare events. Organizations, for example, ask managers to conduct postproject reviews, with the intention of improving front-end planning and subsequent execution (Williams 2008).

Madsen (2009) similarly notes in his paper that governments and private organizations invest a great deal of effort to investigate disasters to “extract ‘lessons learned’” from these events. More generally, deliberate learning from rare events presents organizations with the opportunity to codify tacit knowledge. In some instances, organizations take codification one step further, setting up units or structures that are specifically charged with analyzing and accumulating knowledge that results from rare events. The resource expenditures needed to institutionalize learning from rare events depend on the category of rare events and the strategy of the organization.

Zollo (2009) examines this process in the U.S. commercial banking industry. He argues that because learning from acquisition experience is often distorted by
high causal and outcome ambiguity, organizations undertake a “deliberate effort to articulate and codify various aspects of the decision-making process.” This usually entails reducing “experience heterogeneity” by grouping together experiences under a single heading such as “accidents” or “acquisitions.” However, although reducing lower experience heterogeneity makes it easier for organizations to analyze information, it also increases the risk of competency trap: the tendency of organizations to progressively confine their attention to skills that are believed to deliver success, while at the same time ignoring environmental changes that make these skills less effective.

Maintaining a balance between focus and variability requires constant revision of organizational processes that automatically transforms ambiguous information into codified knowledge. Seen in this light, deliberate learning from rare events, to use a phrase by Weick and Sutcliffe (2006, p. 514), is a corrective activity that focuses attention on “altering the codes, introspecting the coding process itself, and most of all, reducing the overall dependence on coding and codes.”

Emergent Learning from Rare Events

Because rare events are usually unexpected, they also generate unanticipated insights (Meyer 1982). Learning from rare events is therefore often an emergent process of discovering useful lessons from experiences that could not have been foreseen. As Christianson et al. (2009) put it in their paper for this issue, a rare event is an “interrupt” in routine activities that creates a “surge of meaning” that extends the organization’s awareness of itself and its capabilities. The surge of meaning “flows in two directions, away from the disruption toward earlier times, and away from the disruption toward future possibilities.” The organization, argue Christianson et al., can subject this surge to a systematic analysis with a particular goal in mind, or it can allow the learning to emerge by letting people “see more clearly what was already underway, what they had been learning, and the limits of their previous comprehension.” This process, however, is sensitive to hindsight biases that influence how organizations update current experience.

Cohen and Levinthal (1994) note that such updating of experience is subject to path dependency effects, which in turn influence emergent learning. Lampel and Shapira (2001) likewise show how learning from similar rare events can produce divergent learning trajectories. Broadly speaking, therefore, research suggests that learning from rare events interacts with previous history, and is strongly influenced by cognitive heuristics that are adapted to more routine events. Faced with rare events, individuals and organizations therefore confine their analysis to recent experience, and derive future aspirations retrospectively from past examples of rare events. The result, as Zollo (2009) shows in his paper, is a learning process that all too often is shaped by selective and biased interpretation of outcomes: Success reinforces unwarranted confidence in managerial competencies, and failure is attributed to unforeseen and unforeseeable external circumstances.

Finally, Beck and Plowman (2009) suggest that avoiding these pitfalls depends on integrating how decision makers in different levels of the organization interpret rare events. Using Isabella’s (1990) model, they argue that middle managers have a critical role to play during the four stages that comprise rare events interpretation: anticipation, confirmation, culmination, and aftermath. During anticipation, middle managers rely on rumors and other information fragments from superiors and subordinates to prevent a single dominant interpretation from emerging prematurely. During the confirmation stage, middle managers work to counter memory biases by “aggressively” gathering and sharing information that points to alternative explanations of what may happen. In the culmination stage, middle managers seek to balance deliberate learning that tends to be confined within deeply entrenched frames with the emergent learning that is susceptible to haphazard application of cognitive biases by “blending” the disparate explanations of the rare event that are circulating within the organization. In the aftermath stage, middle managers balance deliberate and emergent learning by evaluating competing views of how the organization managed the rare event, and then “synthesizing” these views into a “unitary, though rich, account” that communicates not only lessons learned, but also the learning process itself.

Directions for Future Research

When we conceived this special issue, our primary goal was to increase awareness of a stream of research that for methodological and conceptual reasons has been relatively neglected. Taken together, the papers in this special issue go some distance toward meeting our goal. They reveal how the interaction between rare events and organizational learning triggers a multiplicity of processes prior to, during, and in the aftermath of these events. They also contribute to our general understanding of organizational processes by showing, among other things, how different managerial levels interact, how organizations reshape key routines, how organizations differentially allocate attention, and how regulations influence learning.

Raising awareness is arguably only a first step. Research is truly productive when it reveals problems and issues that scholars find interesting and profitable. The papers in this special issue point to a number of areas where further research is needed.

1. The papers in this special issue on the whole explore learning by individual organizations. But individual organizations usually derive part of their identity
from the industry or sector in which they operate. Thus, organizations learn from rare events not only through their own experience but also from that of their reference group. The sensemaking processes that are extensively discussed in the special issue therefore take place not only at the individual but also the collective level. As a rule, it is not only the members of specific organizations that process and struggle with the meaning of rare events, but populations of firms as well.

Could research on learning from rare events therefore benefit from studies that examine how population learning interacts with organizational learning? Specifically, to what extent does similarity of products, operations, or strategy influence the propensity to learn from the experience of other firms? Under what conditions does population-level learning drive learning at the level of individual organizations, or vice versa, when does the experience of individual organizations exert preponderant influence on collective learning? Likewise, to what extent does rare event experience of related organizations, such as suppliers and buyers, influence learning?

2. The papers in this special issue tend to see learning as an activity that resides primarily in the organizations that are impacted by the consequences of rare events. But most organizations operate in environments that are regulated by institutions that draft and oversee rules that govern key organizational activities. These institutions collect and analyze data on rare events, and then transfer their conclusions to relevant organizations through guidelines, or mandatory requirements. The aviation industry is a good example. Accidents, near accidents, and the possibility of accidents are codified into rules and practices that change how airlines operate (see Tamuz 2000, Lampel 2006).

Thus, organizations that at first sight appear not to be learning from rare events, are in fact doing so indirectly via these institutions. A fuller picture on learning from rare events should therefore emerge from work on how regulatory institutions analyze and transfer learning from rare events. We need to know more about the systems that regulatory bodies use to collect and analyze data. What are the internal organizational processes in these institutions and how do they manifest themselves when it comes to issuing guidelines or drafting and enforcing new rules?

3. The papers in this special issue see organizational interaction with rare events as confined almost entirely to the task environment in which these organizations operate. But organizations increasingly operate in an information-saturated media environment where rare events create a sense of urgency. The impact of such events is therefore greatly enhanced by the power of widely disseminated images, and by the powerful interactivity of high-speed data and communication systems.

Employees, consumers, shareholders, and citizens increasingly pressure organizations to draw appropriate lessons and take action. Organizational elites therefore find it increasingly difficult to argue that learning is a confidential process whose lessons belong to a small group of decision makers. In effect, greater availability of information has produced a strong link between learning and legitimacy with important consequences for organizational strategies in the 21st century. We need more research that examines how this link operates, and how it influences the narratives that firms produce in the aftermath of rare events.

4. Finally, the papers in this special issue analyze learning processes primarily from the perspective of organizational effectiveness. Organizational research, however, shows that they are usually governed by dominant coalitions rather than unitary command systems. Members of the dominant coalition will often interpret rare events differently, and the lessons derived will likewise tend to reflect divergent interests. Hierarchical agendas will frequently have greater influence on learning than espoused organizational purpose. Thus, when it comes to discussing rare events, views reflect power and are used to gain power. Lessons from rare events will therefore be employed to influence how the past is represented, subordinating the process of learning from the past to the political imperatives that all too often shape decision making.

The politics of learning from rare events, in other words, form an important background to how organizations transform lessons into actions. But it is a background that for obvious reasons researchers find difficult to penetrate. Notwithstanding the difficulties of exploring the political process that shape learning from rare events, much can be gleaned from autobiographies and memoirs that reveal informal discussions, not to mention official reports that provide details that are not usually available to researchers. These data are indispensable for building a picture of the politics of learning from rare events, and for examining such issues as the influence on learning of blame games and competition for credit, how selective withholding of information influences learning, and the impact of politically motivated exit on the ability of organizations to retain valuable past lessons.

After almost two decades of research on organizational learning, we now have a substantial body of knowledge on how organizations learn and how they put this learning to use. Furthermore, this knowledge is not confined to scholarly journals; it has made significant impact on managerial practice as well. Broadly speaking, however, the impact on practice has emphasized learning as incremental experimentation and continuous improvement. Learning from rare events, by contrast, has been downplayed due to the difficulties of translating learning from rare events into reliable knowledge.

For organizations that experience rare events, directly or indirectly, putting aside learning from rare events as
either unreliable or attainable has never been a realistic option. Rare events are discontinuities that not only test organizations, but also reveal new knowledge and productive opportunities. At a deeper level, interpreting rare events and thus learning from rare is unavoidable: Rare events not only draw attention, they drive interpretation beyond their immediate impact that neither decision makers nor society at large is inclined to overlook.

This special issue attempts to redress the imbalance in the organizational learning literature by directing researchers’ attention toward organizational learning that results from rare events. By bringing together a cluster of papers that explore the antecedents of learning from rare events, and the processes that ensue, we hope to encourage methodological and conceptual thinking on issues that are relevant, but also to foster the collective awareness of a research area that contains important and interesting research issues.

References
Madsen, P. M. 2009. These lives will not be lost in vain: Organizational learning from disaster in U.S. coal mining. Organ. Sci. 20(5) 861–875.


