PROCEEDINGS
OF
LONDON INTERNATINAL CONFERENCES

eISSN 2977-1870

Repressed Crises and Organizational Crisis Vulnerability: A Theoretical and Empirical Study

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Abstract

"We cannot become complacent," a lesson learned from the Challenger disaster and cited by the Director of the NASA Safety Center (NASA Safety and Mission Assurance, 2021), highlights the importance of taking even minor issues and early warning signals seriously. While the literature suggests that organizations can learn from crises, the translation of crisis experiences into sustained learning, organizational processes, and resilience often actually remains an incomplete practice. This research conceptualizes resilience within a four-stage model that integrates early crisis exposure, organizational memory, organizational processes, and higher-order dynamic capabilities. The model builds on the assumption that resilience emerges through the interaction between these stages rather than as a static organizational attribute.

Based on this conceptualization, a coding framework was developed to enable a structured analysis of organizational crisis experiences across four analytical levels. The framework translates the theoretical model into a set of guiding questions that allow for systematic examination of how crises are perceived, processed, stored in organizational memory, and transformed into adaptive capabilities.

Overall, the framework is intended to be applicable across different types of organizations, as it provides a structured approach for analyzing how organizations learn from crises and develop resilience over time.

Keywords: Organizational resilience, Organizational crisis, Organizational learning, Organizational memory, Organizational crisis experience, Dynamic capabilities

https://doi.org/10.31039/plic.2026.16.379

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Introduction

A report by PwC's Global Crisis Survey released in 2019 outlines that crises are now a normal feature of contemporary business environments, with 70% of executives having encountered at least one crisis in the past five years. It also reveals that an organization experienced an average of three crises, and that 95% of the survey's respondents expected future crises. Of diverse types of crises reported, operational crisis is the most common one, affecting 53% of organizations. Such a crisis involves disruptions to core business operations, such as operational breakdowns, competitive disruption, supply chain issues, and product failures. According to PwC (2019), crises can develop dynamically, as initial events may escalate into broader chains of interconnected disruptions, thereby increasing organizational vulnerability over time. In this context, crisis preparedness is not only an optional organizational capability but also an important strategic factor that can contribute to competitive advantage (PwC, 2019). According to Cocchiara (2009), organizations that lack measures to ensure business continuity and operational recovery are particularly vulnerable; more than 40% of them cease operations within a few years following a major disaster.

esearch in developmental psychology highlights the functioning of adaptive systems (e.g., cognitive abilities and self-regulation) that enable children to achieve healthy development despite being exposed to significant stressors, provided that these protective systems remain intact. This phenomenon is commonly referred to as resilience, or the ability to maintain positive adaptation and development despite significant risks or adverse life circumstances (Masten, 2001).

In recent years, research interest in organizational resilience has continuously intensified, highlighting its growing significance as a multilevel construct. Organizational resilience is often conceptualized as the ability of organizations to withstand disruptions or to recover from periods of adversity (Raetze et al., 2021). At the organizational level, resilience can similarly be understood as a capacity to maintain functioning and recover in the face of disruption. Organizations that encounter and successfully navigate crises could emerge stronger and have a broader range of options for action than before the crisis (Lengnick-Hall et al., 2011). Being resilient enables organizations to effectively handle unexpected events, recover from crises, and emerge from them stronger over the long term, which is becoming increasingly important in times of high volatility and uncertainty (Duchek, 2020).

Organizational resilience research at the individual level has produced extensive insights, particularly in high-stress occupations such as emergency services and helping professions, as well as in more general work contexts. A large body of research has examined antecedents of organizational resilience, such as financial resources and structural conditions, including flexibility and organic organizational structures that promote employee connectedness. Resilience is often operationalized as an outcome, while the processes leading to its emergence remain less well understood (Raetze et al., 2021). The extent to which successful crisis management contributes to the development of organizational resilience via organizational memory remains underexplored.

This study develops a conceptual framework that explains how early crisis exposure is translated into organizational resilience through organizational memory processes (retention

and forgetting), and how this process is enabled by organizational reliability and dynamic capabilities, including recursive feedback loops.

Accordingly, the study addresses the following research question: How does early crisis exposure contribute to the development of organizational resilience through organizational memory processes, and how are these relationships shaped by organizational reliability and dynamic capabilities?

By addressing this question, the study advances a process-oriented understanding of organizational resilience and highlights the role of organizational memory as a key mechanism linking crisis experience to resilience development.

Literature

The terms volatility, uncertainty, complexity, and ambiguity (VUCA) describe the contemporary environment in which organizations operate (Raetze et al., 2021; Evenseth et al., 2022). Organizations face various large-scale challenges, including natural disasters, terrorist attacks, and global financial crises, as well as smaller-scale adversities. Such events have implications at the organizational level, but can also affect teams (e.g., impairment of team dynamics) and individuals (e.g., impairment of well-being) within the organization. In recent years, scientific interest in organizational resilience has steadily increased. Resilience is understood as a central characteristic of individuals, teams, and organizations in dealing with adversity.

In organizational resilience research, there has been a shift in focus from high-reliability organizations (e.g., emergency departments, airlines, and space agencies) toward ‘normal’ organizations, small and medium-sized enterprises, and family firms. Research on organizational resilience is heterogeneous, characterized by diverse conceptualizations and understandings. In many studies, resilience is viewed as an outcome and described as a collection of relevant resilience resources. Only a few studies take a closer look at the underlying organizational capabilities and routines (Raetze et al., 2021).

The majority of existing research on organizational resilience is descriptive and outcome-oriented. In addition, they often assess resilience retrospectively, for example, by asking whether a company has remained successful despite adverse challenges (Lengnick-Hall et al. 2011). In a developmental perspective, resilience emerges over time through repeated experiences of dealing with risks, strains, and stressful situations. In the face of adversity, individuals and organizations develop new coping capabilities through successful adaptations, from which additional competencies emerge, while existing abilities are simultaneously further developed, refined, and strengthened. In organizational theory, it is often overlooked that resilience includes the capacity to emerge from adversity stronger and more resourceful (Sutcliffe & Vogus, 2003).

Resilient organizations possess dynamic capabilities that enable them to adapt to changing and challenging conditions. Therefore, resilience should not be understood as a static organizational characteristic or a one-time outcome, but rather as a dynamic capability that develops over time through continuous learning and adaptation processes (Duchek, 2019). A

strong link exists between organizational resilience and organizational learning, with the latter being regarded as a fundamental driver of the former (Evenseth et al., 2022). Organizational learning can be understood as an ongoing process in which experience gained from task performance is transformed into knowledge. This knowledge then alters the organizational context and, in turn, influences future experiences (Argote & Miron-Spektor, 2011).

Furthermore, organizational learning is an integral component of all three phases of organizational resilience: anticipation, coping and adaptation (Evenseth et al., 2022). In this context, learning plays a central role in dealing with critical situations and takes place before a breakdown (e.g., through scenario-based training), during ongoing operations, and after a breakdown (e.g., through analyzing causes, deriving lessons learned, and implementing corrective actions) (Kayes, 2015). In this context, strategic resilience emerges from the interplay between learning and unlearning, whereby unlearning (e.g., outdated routines or misleading knowledge) can be a prerequisite for effective new learning.

Organizational learning is conceptualized as a cyclical process comprising both learning and unlearning. This process, known as the "metamorphosis cycle," is considered key to strategic resilience. Learning needs to be ongoing and span the full continuum of situations, from daily operations to crisis events. Double-loop and triple-loop learning, which are forms of deeper learning, are especially important for organizational resilience development. For learning to occur continuously, organizations need structured systems that incorporate a range of learning practices. To foster organizational resilience, the following key components of organizational learning have been identified: effective management of experiential learning, a systemic approach to learning, the capacity to unlearn outdated knowledge and practices, and the presence of an environment that supports organizational learning (Evenseth et al., 2022).

A distinction is made between unlearning as a deliberate and necessary process that enables organizations to acquire new ways of doing things and unintentional forgetting, in which organizations lose knowledge unintentionally, often with negative consequences for productivity and competitiveness. The amount of time and energy organizations must invest in letting go of no longer needed knowledge or in preserving important knowledge to prevent it from being lost is considerable (de Holan & Phillips, 2004). That said, mistakes should not be understood as an indication of a learning deficit, but rather as a potential source of learning. Moreover, Sitkin (1992) argues that learning is most effective when it emerges from small, controllable failures. So, organizations should deliberately experiment and learn from failure by using intelligent failure as a strategy to foster innovation and improvement.

A key reason why many organizations do not learn effectively from failure may be the limited attention paid to small, everyday organizational failures (Cannon & Edmondson, 2005). Madsen and Pedersen (2010) argue that organizations learn more from failures than from successes, and that knowledge derived from failure depreciates more slowly than knowledge derived from success. Moreover, the magnitude of a failure influences the extent to which organizations can learn from it. Small failures are often ignored because, at the moment they occur, they are perceived as insignificant or as isolated deviations. As a result, important learning opportunities are not used in a timely manner. Even organizations that have made considerable efforts to build so-called "learning organizations" find it difficult to actually

implement this learning orientation in their day-to-day handling of failures (Cannon & Edmondson, 2005).

Furthermore, organizations can learn from so-called “High Reliability Organizations” (e.g., hospital emergency departments or nuclear power plants), as these organizations closely monitor and take even small errors and deviations seriously rather than ignoring them. In doing so, HROs ensure that resources are kept available so they can remain responsive in emergencies. Decisions are not made solely based on hierarchy, but by the individuals with the most relevant knowledge of the situation (Weick & Sutcliffe, 2007). Learning from failure is hindered either by a lack of the necessary know-how to systematically analyze experiences or by an insufficient understanding of cause-and-effect relationships.

Unfortunately, both the low tolerance for failure in many organizational cultures and individuals’ reluctance to disclose failures constitute barriers to learning from failure. Learning from failure in organizations can occur through three core processes: identifying failures, analyzing failures, and deliberate experimentation (Cannon & Edmondson, 2005). Dynamic capabilities arise from organizational learning processes, which in turn emerge from the interplay and co-evolution of experience accumulation, knowledge articulation, and knowledge codification (Zollo & Winter, 2002). Successful organizations act proactively by implementing data systems, transparency, and feedback mechanisms to identify failures at an early stage and learn from them systematically. Similarly, proactive feedback collection from customers, employees, and other stakeholders is an important tool for identifying failures. This practice is important because only about five to ten percent of dissatisfied customers actually file a complaint; the remaining customers simply switch providers.

A culture that promotes failure identification is equally important. An interesting example is the Children’s Hospital Minneapolis, which implemented a ‘blameless reporting’ system that encourages employees to report medical errors immediately and to provide additional information for root cause analysis. With regard to failure analysis, it should be noted that such analysis must be sufficiently deep to fully realize the learning potential from failures. Analysis processes are often successful when participants bring technical expertise, analytical skills, and diverse perspectives. A structured approach to the analysis process is extremely important in order to avoid premature conclusions or interpretations.

In addition, failure analysis is improved when different individuals are involved, including those who were not directly involved in the failure (bringing in new perspectives, reducing biases). Deliberate experimentation, as a third approach, enables organizations to devote part of their energy to trying out new things and discovering what is promising and what is not. In doing so, they take the risk of more failures. Deliberate experimentation requires the ability to analyze experiments, including testing hypotheses, which is an understanding of complex, interdependent processes, to determine which changes produce which effects, as well as organizational resources (time, means, and structures) (Cannon & Edmondson, 2005).

Research Methodology

Conceptual Organizational Resilience Model

To understand how organizations build resilience to overcome crises, this study develops a conceptual model that integrates insights from organizational learning theory, organizational memory, and dynamic capability theory. The aim of the model is to explain how early crisis experiences are processed within organizations and how these processes ultimately contribute to organizational resilience and influence future crisis vulnerability.

The model views organizational resilience not only as an outcome, but also as a process through which resilience develops over time. Early crisis experiences serve as the initial input and are processed through three interconnected components: an organizational memory layer, organizational processes, and resilience outcomes (see Figure 1). In addition, feedback loops connect outcomes back to future crisis inputs, indicating that prior resilience influences how organizations interpret, respond to, and learn from subsequent crises. The interpretation and processing of early crisis experiences may differ depending on organizational learning orientations. For instance, organizations may treat small failures as opportunities for experimentation and learning rather than attempting to avoid them (Sitkin, 1992). Similarly, Madsen and Pedersen (2010) suggest that organizations may develop an orientation in which learning from failures is more effective than learning from successes.

The organizational memory layer captures how organizations transform crisis experiences into knowledge, store it, and use it to improve performance (Argote & Miron-Spektor, 2011). This layer also includes processes of organizational forgetting, through which knowledge may decay, become inaccessible, or be intentionally discarded (de Holan & Phillips, 2004). Through the interplay of retention and forgetting, early crisis experiences are selectively preserved and shape the organizational knowledge base over time. Organizational processes translate stored experiences into adaptive action. Organizational reliability refers to the ability of organizations to maintain safe and effective functioning in high-risk environments through continuous attention, rapid response, and collective mindfulness. High Reliability Organizations achieve this through continuous learning and error sensitivity (Weick & Sutcliffe, 2001).

In addition, dynamic capabilities represent higher-order processes through which organizations integrate, build, and reconfigure competencies in response to changing environments. These capabilities develop through learning processes and experience accumulation, enabling organizations to adapt their operational routines over time (Zollo & Winter, 2002). Together, reliability and dynamic capabilities constitute the central mechanisms through which organizations respond to crises.

The outcome of these processes is organizational resilience, understood as the capacity to anticipate, cope with, and adapt to adversity over time. From a learning-based perspective, resilience is not only the ability to survive crises but also to learn from them and emerge stronger (Kayes, 2015). From a capability-based perspective, organizational resilience can be conceptualized as a set of dynamic capabilities that enable organizations to respond effectively to disruptions and adapt to changing conditions (Duchek, 2019). Accordingly,

resilience is not a static characteristic but an evolving capability shaped by organizational learning, memory, and adaptive processes.

Through the inclusion of feedback loops, the model further assumes that organizational resilience itself influences future crisis exposure and the way organizations process subsequent experiences. In this sense, resilience is not only an outcome of prior processes but also a conditioning factor for future learning and adaptation cycles.

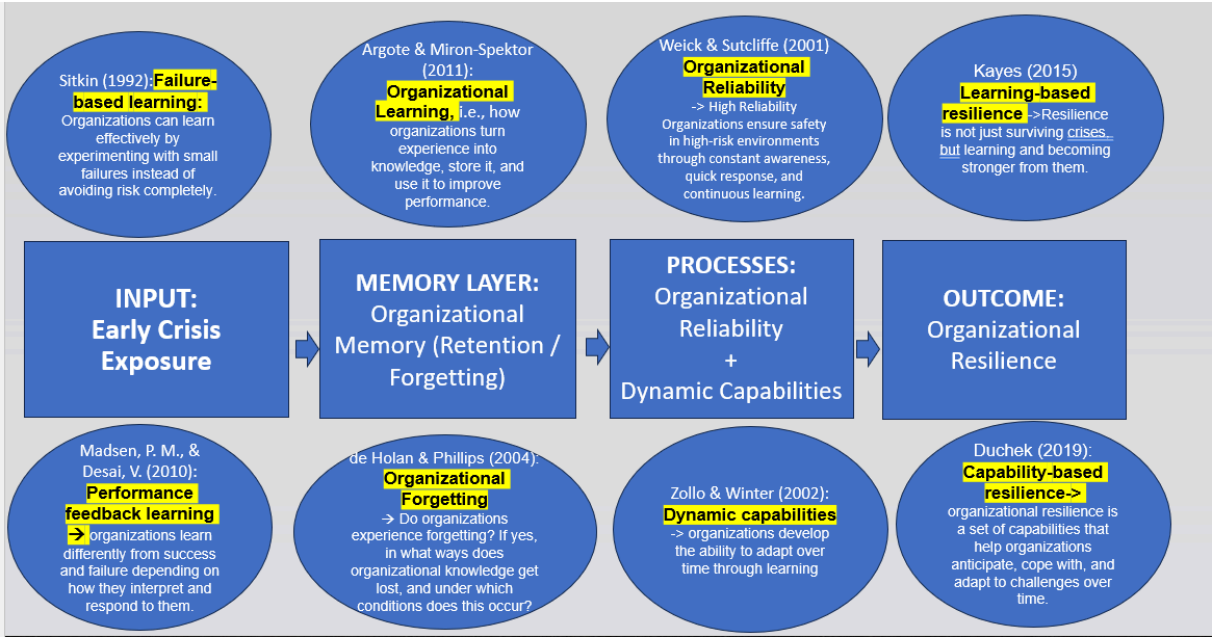

Figure 1: From Early Exposure to Crisis to Organizational Vulnerability

Source: own figure

Coding Framework: Four-Level Crisis Analysis

To properly utilize the conceptual model and guide the empirical analysis, a four-level coding framework was developed. The framework translates the theoretical constructs of crisis experience, organizational memory, organizational processes, and resilience into analytical categories that can be systematically applied to case study data. Each level represents a distinct stage in the organizational response to crises and is associated with specific coding questions:

> **Level 1** – Crisis Experience focuses on the emergence and initial recognition of crisis events. The analysis examines whether organizational members perceived the event as a crisis and whether warning signs or precursor signals were present prior to the event. This level captures the conditions under which crises enter the organizational learning cycle and serves as the starting point for the analysis.
>
> **Level 2** – Organizational Memory examines how crisis-related experiences are retained, documented, and institutionalized within the organization. Particular

attention is paid to the processes through which knowledge is stored, transferred, and maintained over time, as well as to mechanisms of organizational forgetting. The analysis investigates which lessons were preserved and embedded in organizational routines and which experiences were ignored, lost, or suppressed, reflecting the concept of "repressed crises."

Level 3 – Organizational Processes focuses on the interpretation and processing of crisis experiences. This level examines how organizational actors made sense of the crisis, how information was communicated within the organization, and whether learning mechanisms or feedback loops were activated. It also explores how stored knowledge was translated into action through organizational learning, decision-making, and adaptation processes.

Level 4 – Resilience assesses the outcomes of these processes in terms of organizational adaptation and recovery. The analysis investigates whether the organization implemented changes in response to the crisis, whether similar crises reoccurred, and how effective recovery efforts were. This level captures organizational resilience as the capacity to anticipate, cope with, and adapt to adverse events over time.

The coding framework serves as the primary analytical tool for the case study analysis. For each case, empirical material from accident investigation reports, official company documents, media reports, and academic literature is systematically coded according to the four analytical levels. This approach enables a structured examination of how crises emerge, how organizations retain or lose crisis-related knowledge, how learning and sensemaking processes unfold, and whether these processes ultimately contribute to organizational resilience.

Throughout this study, the coding framework is applied consistently across all case studies to facilitate comparison across different organizational contexts. For example, in the case of the Boeing 737 MAX crisis, the analysis examines whether warning signals were present prior to the accidents (Level 1), how previous safety-related experiences were documented or forgotten within the organization (Level 2), how the crisis was interpreted and managed by organizational actors (Level 3), and whether the organization implemented effective adaptations following the crisis (Level 4). Applying the same analytical structure across cases enables the identification of recurring patterns of organizational learning, memory failure, adaptation, and resilience development. Table X summarizes the four analytical levels and their corresponding coding questions.

Table 1: Coding Framework

Level	Focus	Key Coding Questions
Level 1 – Crisis Experience	Crisis emergence	Was the event perceived as a crisis? Were early warning signals present?
Level 2 – Organizational Memory	Storage & forgetting	What was documented and institutionalized? What was ignored or lost ("repressed crises")?
Level 3 – Processes	Sensemaking & learning	How was the crisis interpreted, communicated, and processed? Were feedback loops activated?
Level 4 – Resilience	Adaptation outcome	Did the organization adapt? Did similar crises reoccur? How effective was recovery?

Source: own table

Case Study Selection

Two well-known organizational disasters were selected for this study: the Boeing 737 MAX crashes and the NASA Challenger disaster. Both cases are extensively documented in accident investigation reports, academic literature, and media sources, providing rich empirical material for analysis. Their prominence and the availability of detailed evidence enable the systematic application of the four-level coding framework and support an initial assessment of its usefulness for analyzing organizational learning, organizational memory, and resilience.

Case Study Analysis

Case 1: Boeing 737 Max

The Boeing 737 MAX case (2018–2019) involves two fatal crashes—Lion Air Flight 610 (2018) and Ethiopian Airlines Flight 302 (2019)—resulting in a total of 346 fatalities. The accidents were linked to a technical failure involving the MCAS flight control system and sensor malfunctions, with a key analytical focus on the recurrence of a similar crisis pattern (Komite Nasional Keselamatan Transportasi, 2019; Air Accident Investigation Bureau of Ethiopia, 2022).

🟥Level 1 – Crisis Experience

The first crash was initially treated as a technical anomaly rather than a systemic failure (Komite Nasional Keselamatan Transportasi, 2019; National Transportation Safety Board, 2019). Although early warning signals existed, they were not fully recognized or acted upon (U.S. House Committee, 2020).

🟧 Level 2 – Organizational Memory

The risks associated with the MCAS system were only partially documented (U.S. House Committee, 2020), and critical safety knowledge was not fully institutionalized within the organization (National Transportation Safety Board, 2019). As a result, key information was effectively lost or insufficiently embedded in organizational memory (Komite Nasional Keselamatan Transportasi, 2019; Air Accident Investigation Bureau of Ethiopia, 2022).

🟨 Level 3 – Processes

Weak feedback loops existed between accident investigations, engineering teams, and regulatory bodies (U.S. House Committee, 2020; National Transportation Safety Board, 2019). In addition, organizational sensemaking after the first crash remained limited, constraining effective learning and response (Weick & Sutcliffe, 2001; U.S. House Committee, 2020).

🟩 Level 4 – Resilience

The repetition of the same failure indicates low adaptive capacity (Komite Nasional Keselamatan Transportasi, 2019; Air Accident Investigation Bureau of Ethiopia, 2022). Organizational learning only occurred after the second crash, suggesting delayed and reactive rather than proactive resilience development (U.S. House Committee, 2020).

Case 2: Nasa Challenger Disaster

The NASA Challenger disaster (1986) occurred when the Space Shuttle exploded 73 seconds after launch, resulting in the deaths of all seven astronauts. The accident was caused by the failure of the O-ring seals under unusually low temperatures (22 °F), a risk that had been identified by engineers prior to launch. Despite these warnings, launch approval was given under organizational and managerial pressure, leading to the realization of a known technical risk (Rogers Commission,1986; Vaughan, 1996).

🟥Level 1 – Crisis Experience

The O-ring risk was known prior to the launch but was not treated as a critical crisis signal (Vaughan, 1996; Rogers Commission, 1986). Although warning signals were present, they were not escalated into the final decision-making process (Rogers Commission, 1986).

🟧 Level 2 – Organizational Memory

Prior warnings regarding the O-ring vulnerability existed but were not institutionalized within organizational decision-making routines (Vaughan, 1996). Instead, critical safety knowledge was overridden by managerial framing and a normalization of deviance over time (Vaughan, 1996).

🟨 Level 3 – Organizational Processes

There was a breakdown in communication between engineers and NASA management, which limited effective risk assessment (Rogers Commission, 1986). In addition, hierarchical structures and schedule pressure influenced the decision-making process, weakening the ability to act on technical concerns (Rogers Commission, 1986; Weick, 1990). Overall,

feedback loops between technical risk assessment and the final launch decision remained ineffective (Weick, 1990).

🟩 **Level 4 – Resilience**

No effective organizational learning occurred prior to the disaster (Vaughan, 1996). The system failed to adapt despite repeated warning signals, and meaningful organizational reforms were only implemented after the accident (Rogers Commission, 1986).

Cross-Case-Analysis and Discussion

This section compares the two case studies—the Boeing 737 MAX and the NASA Challenger disaster—based on the findings generated through the four-level coding framework. It also connects these findings to the conceptual resilience model by examining whether crises are best understood as a process of organizational learning and adaptation or as an outcome reflecting organizational resilience.

In both the Boeing 737 MAX and NASA Challenger cases, warning signals were present but were not sufficiently acted upon in decision-making, as they were downplayed or overridden by organizational and managerial pressures. In both cases, meaningful organizational learning and major safety reforms took place only after the disasters, indicating a predominantly reactive rather than proactive learning process.

At Level 1 (Crisis Experience), both the Boeing 737 MAX and NASA Challenger cases show that warning signals were present prior to the accidents but were not adequately taken into account in decision-making processes. In both cases, early risk indicators were either misinterpreted, downplayed, or not sufficiently escalated, despite their relevance for flight safety. At Level 2 (Organizational Memory), both cases show a failure to institutionalize critical safety knowledge. In the NASA Challenger disaster, earlier warnings about O-ring risks were not embedded in decision-making routines. Similarly, in the Boeing 737 MAX case, key safety knowledge regarding the MCAS system was not effectively integrated into organizational memory, limiting its use in subsequent decision-making.

At Level 3, both cases show weak feedback loops between technical risk assessment and decision-making, which limited the effective communication and escalation of safety-critical information. At Level 4, both cases show that organizational learning and meaningful safety improvements only occurred after the crisis, indicating a reactive rather than proactive approach to resilience.

In the Boeing 737 MAX case, resilience appears to be understood primarily as an outcome rather than a continuous process. Weak organizational memory and insufficient institutionalization of safety learning limited the retention of critical knowledge, meaning that resilience was effectively constructed after the crisis rather than developed through ongoing learning and adaptation. In the NASA Challenger case, resilience does not emerge as either a process or a pre-existing outcome, as organizational learning mechanisms were systematically undermined. Although critical risk information was available, it was normalized and overridden through organizational pressure, preventing the development of effective adaptive responses prior to the disaster.

Conclusion and Outlook

Organizational crises have increasingly become a "new normal," requiring organizations to systematically respond to and learn from disruptive events. While the literature suggests that organizations tend to learn more effectively from failures than from successes, empirical evidence shows that learning processes are often inconsistent and fragmented across contexts. To address this gap, this study proposed a conceptual resilience model consisting of four stages: early crisis exposure, organizational memory, organizational processes, and organizational resilience as an outcome. Based on this model, a four-level coding framework was developed to enable a structured analysis of crises through guiding questions related to each stage.

The application of this framework to the Boeing 737 MAX and NASA Challenger cases demonstrates that organizational responses to crises often deviate from the principles of High-Reliability Organizations. In both cases, warning signals were not effectively integrated into decision-making, organizational memory systems failed to support sustained learning, and adaptive responses emerged primarily after the occurrence of severe failures.

Overall, the findings suggest that resilience should not be understood solely as an outcome of crises, but rather as an ongoing process shaped by the interaction between memory, learning, and organizational decision-making over time.

Future research could extend this study by applying the framework to additional and more diverse cases to further test its analytical robustness and generalizability. In addition, comparative studies across industries or organizational types could provide deeper insights into how contextual factors influence the development of resilience as a dynamic capability.

To further validate and refine both the conceptual resilience model and the coding framework, the next step involves conducting interviews with organizations about their crisis experiences. These interviews will include questions related to organizational memory, such as whether crisis events were subsequently documented and whether relevant knowledge was available prior to the crisis but not taken into account during decision-making processes.

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