The Development of Crisis Leadership during Critical Infrastructure Breakdowns: a Possible Intracrisis Learning Trigger.

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This manuscript sketches a theoretical perspective that focuses on crisis leadership as a trigger to promote the adoption of institutionalized practices of intracrisis learning in organizations. We present important definitions of organizational crisis and detail two main approaches on crisis management: signal detection and high reliability. Although both of them have organizational learning embedded on their roots, some differences must be highlighted. The signal detection approach is based on the operational perspective of crisis management and focus on anticipation and intercrisis learning. On the opposite, the high reliability approach emphasizes the political-symbolic approach of crisis management and focus on reliability and intracrisis learning. We defend that the nature and dynamics of organizational crises is changing, prejudicing crisis anticipation practices in today's age of high-speed and global mass communication. It increased the relevance of intracrisis learning and crisis leadership. Finally, we seek to set the stage for advancing future research on organizational learning during crisis events by formulating lessons that may enhance leadership ability to promote learning that aims to improve response during a particular set of crises, known as critical infrastructural breakdowns.

Key words: *organizational learning; crisis management; leadership.*

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1 Introduction

For decades, researchers have developed and consolidated a science of risk and crisis management that was embedded in a strong and rewarding Cartesian Philosophy: identification, isolation, measurement, statistics, lessons of the past, best practices, ready-made effective responses in case of incidents, among other principles (Fink, 1986). However, as a result of adopting crisis management principles based on this Cartesian mentality, the lessons learned after a crisis are formally reported, and frequently are presented in the form of bureaucratic documents, which will be forgotten across the time and will not guide organizational leaders when similar crises happen again (Birkland, 2009; Elliott, 2009). Besides, the 21st century became and introduced new forms of crisis, such as cyberterrorism, infrastructural collapses, the changing of weather patterns, global financial crises, among others, and increased the challenges for organizational crisis management (Boin, 2004).

The insight that modern societies and organizations face an increasing number of crises, which are more dynamic and transboundary than before (Boin & Rhinard, 2008; Roe, 2009), shows the importance of better understanding the relations between crisis and learning. As this new set of crises bring larger human, political, social and financial repercussions, it seems clear that learning during crises needs attention, even because it is different from

learning in routine situations (Moynihan, 2008). Certainly, crises constitute an unique opportunity to learn and to make changes within organizations (Nystrom & Starbuck, 1984). Concerned with this issue, the crisis management literature has focused on the intercrisis learning, that is, the learning from one crisis to prepare for another (Moynihan, 2009).

We assume that this approach is no longer enough in the new cosmology of risks and crises posed by the 21st century (Boin & McConnell, 2007; Lagadec, 2009). As a result of its adoption, it can be observed a continuing failure of organizations to learn from crisis (Elliott, 2009). Some examples can illustrate this failure: frequent power outages and infrastructural breakdowns in Sweden (Deverell, 2003), Argentine (Ullberg, 2005), and Brazil (Goy & Andrade, 2009); the 9/11 and other terrorist attacks (Boin & Smith, 2006) , the recent financial crisis (Roe, 2009); among others.

We defend that the intercrisis learning approach became surpassed because the shape and dynamics of crises is changing. Recent crises have different causes, play out differently, draw different reactions, and affect societies in different ways (Boin & Rhinard, 2008; Roe, 2009; Wachtendorf, 2009). In this context, the adoption of intercrisis learning is no longer enough, because the lessons learned from prior crises do not correspond with the next one, and the capacity to learn quickly represents an important role in this context (Deverell, 2009).

To address the limitations of practicing intercrisis learning in such a connected and dynamic reality, we recommend the practice of intracrisis learning (Moynihan, 2009), that is, learning that seeks to improve response during a single crisis episode. Crises represent something new for the organization and their leaders, creating the necessity to understand what is going on and to grasp the crisis as it unfolds (Boin, 't Hart, Stern & Sundelius, 2005). In this context, crises can even generate a competitive advantage for the organization, if it is accompanied by a high degree of organizational learning (Roux-Dufort & Metais, 1999). However, organizations tend not to be good learners in the aftermath of a crisis. One crucial barrier is the difficulty to promote organizational sensemaking during crisis episodes (Weick, 1988). As a result, it lacks an authoritative and widely accepted explanation of why and how a specific crisis happened (Boin & Schulman, 2008).

We defend that organizational leadership plays a central role to make the crisis sensemaking process possible, contributing to the practice of intracrisis learning. We think that it is possible to use organizational leadership as an intracrisis learning trigger, conducting the organization out of its initial disorientation during a crisis, even with very little information available and even less of it verified. But how organizations are supposed to do it? The aim of this paper, then, is to sketch a theoretical perspective that focuses on crisis

leadership as a central role to promote the adoption of intracrisis learning in organizations and societies. In addition, this study also aims to peruse the crisis management and organizational learning literature to formulate lessons that may enhance organizational and societal preparation for intracrisis learning during critical infrastructural breakdowns.

Therefore, we want to contribute to organizational learning theory and the crisis management literature by suggesting six steps to help organizations implement an institutionalized view of intracrisis learning practices. If organizations have an embedded view of intracrisis learning on their routine practices, they will implement better responses in crisis' times and, better than that, they will increase their level of organizational learning in both regular and turbulent times.

2 Organizational Crises and Crisis Management

Crises come in many shapes and forms. It is an unstable time or state of affairs in which a decisive change is impending – either one with the distinct possibility of a highly undesirable outcome or one with the distinct possibility of an extremely positive result (Fink, 1986). What will determine if the crisis outcome will be positive or negative is whether the organization is prepared to deal with it. Therefore, as organizations are facing an increasingly number of crises, the interest in this research area has raised and different approaches to crisis research were developed in the literature.

2.1 Different approaches on Crisis Research

There are two main streams in the study of Organizational Crises. The first one is called operational perspective and concentrates on the management of crisis itself. On the other hand, the political-symbolic perspective tries to map out how crisis managers, and the other people involved in a crisis episode, make sense of the crisis (Boin, 2004). Depending on the approach that is used, different characteristics for the organizational crises are identified.

The operational perspective is strongly influenced by the positivism and the functionalist paradigm (Burrell & Morgan, 1979). This approach tries to identify the organizational crisis as an objective phenomenon, which has clear features and characteristics. In this perspective, the organizational crisis is perceived as a low-probability, high-impact event that threatens the viability of the organization and is characterized by ambiguity of cause, effects and means of resolution (Pearson & Clair, 1998). The researchers of the operational perspective, then, tried to reduce these ambiguities with the identification of some characteristics that would permit the recognition of crisis episodes. Some of these characteristics are: (1) information starts to flow rapidly and sporadically (Smart & Vertinsky, 1977; Staw, Sandelands & Dutton, 1981); (2) a great number and variety of stakeholders

become involved (Acquier, Gang & Szpirglas, 2008; Alpaslan, Green & Mitroff, 2009); (3) crises are unpredictable and unexpected (Bazerman & Watkins, 2004; Hermann, 1963); and (4) time is short and limited for the crisis response (Billings, Milburn & Schaalman, 1980; Quarantelli, 1988).

While the operational perspective emphasizes the objective nature of organizational crises, the political-symbolic approach focus on the subjective questions raised during crises episodes (Boin, 2004). This perspective is influenced by the interpretative paradigm (Burrell & Morgan, 1979) and assumes that different people interpret crises in different manners. It defends that crises are transitional phases, during which the normal ways of operating no longer work (Rosenthal, 1978). For the political-symbolic perspective, crises are the result of multiple events, which interact over time to produce a threat with devastating potential (Rosenthal, Boin & Comfort, 2001). At this approach, we can only speak of a crisis if the actors in question perceive the situation as such. In this way, cognitive and political aspects come into the fore, in order to grasp the crisis and respond to it. Furthermore, the political-symbolic researchers put the sensemaking processes at the centre of crisis resolution. The understanding of what one crisis represents and how it has developed is central for crisis resolution (Weick, 1988).

We will follow the political-symbolic perspective of organizational crisis. We think that the way in which the crisis is perceived plays an essential role in order to respond to it. This fits our notion that the definition of a situation in terms of a crisis is the outcome of a political process, in accordance with the research of Boin *et al.* (2005), and that the understanding of one dominant coalition will prevail (Child, 1972). Upon the dominant understanding of the crisis, the organization will mobilize efforts in order to contain the crisis constraints, adopting crisis management practices (Pauchant & Mitroff, 1992). However, as the political-symbolic approach makes clear, organizations are not always able to perceive when turbulent times are coming. Because of that, we will use the frame of critical infrastructural breakdowns as an example of crisis situations.

2.1.1 Critical Infrastructural Breakdowns: a clear example of crises

Crises are the result of multiple events, which interact over time to produce a threat with devastating potential. But this result will only be considered a crisis if organizational leaders and/or stakeholders perceive the threat and impute “meaning” to the unfolding crisis (Boin et al., 2005). Then, it is not always clear when exactly organizations and societies experience a situation in terms of crisis in real life. Trying to avoid this “cognitive trap”, this

paper will analyze one type of crises that is difficult to be unnoticed. In order to sketch a theoretical perspective that focuses the crisis leadership as a central role to promote the adoption of intracrisis learning in organizations and societies, this paper will consider the case of Critical Infrastructural breakdowns.

In wealthy and well-functioning societies, it has become hard to live normally if nothing works. What does it means to live in a society that is suddenly beset by multiple and cascading failures like power blackouts, telecommunications breakdowns or transport gridlocks? The chaos and disorder that overtook the city of São Paulo and 18 Brazilian states in the wake of a huge power blackout (November 2009) provide us with some idea of what a worst-case scenario may look like (Goy & Andrade, 2009). Other examples, like floods in Asia, heavy snowfalls in Europe or hurricanes in USA, can demonstrate the dangerous potential represented by breakdowns in Critical Infrastructure systems, whatever its reason may be. In this way, this paper will focus on Critical Infrastructural Breakdowns because they present challenges that are well beyond the routine contingency planning and management capacities of public authorities and societies. Although they represent a type of crisis that is easy to perceive after happening, organizations and societies are faced with a lot of learning gaps (Helsloot & Beerens, 2009), which represent a great challenge for public and organizational leadership when infrastructural breakdowns happen.

2.2 Crisis Management Practices and Organizational Sensemaking

According to Pearson and Clair (1998), we speak of crisis management when there is a systematic attempt by organizational members with external stakeholders to avert crisis or to effectively manage those that do occur. In this way, crisis management involves two main goals: (1) preventing crises from occurring and (2) responding and containing those that has erupted. Crisis management, then, represents the organizational efforts in order to remove much of the risk and uncertainty that permeates crisis situations (Fink, 1986).

2.2.1 Two streams of crisis management practices: anticipation versus resilience

The crisis management literature has been developed with two main streams in order to help organizations on preventing and responding to crises: the signal detection approach and the high reliability approach. The first one is based on the operational perspective of crisis research and has the assumption that the crisis affects only a part of complex organizational systems. This approach defends that it is possible to identify and isolate the crisis mechanisms, avoiding its spread to the whole organization through signal detection initiatives (Fink, 1986; Mitroff, 2004; Shrivastava, 1987). Arising from the Normal Accident Theory

(Perrow, 1984, 1999), this approach defends that any crisis leaves a lot of signals all over the organization. In this way, the organizational actors must detect those signals and anticipate for the crisis. It is a vertical and centralized view of crisis management, where the organization should identify possible systemic causes that could generate a crisis. Managers, then, should concentrate on the creation of signal detection mechanisms which, allied with contingency plans, will guide organizational action in crisis situations (Brilman, 1985; Fink, 1986; Pearson & Mitroff, 1993).

The signal detection approach is the classical perspective on crisis management and was dominant until the beginning of the 90's (Shrivastava, Sonpar & Pazzaglia, 2009), when its efficacy began to be questioned. At that time, a lot of changes were happening in the organizational world, with the globalization, technological advances and new forms of societal organization (Castells, 2000). With those changes, new forms of risk began to permeate organizations and the nature of organizational crises has changed (Lagadec, 2009; OECD, 2003). The notion of crisis in the 21st century builds on the traditional notion of crisis with its core conceptual elements of threat, urgency and uncertainty (Rosenthal et al., 2001). What sets it apart from the more traditional definition is its emphasis on the tightly woven web of critical infrastructures that characterizes modern society (Boin, 2009). The potential for crossing boundaries sets this new class of adversity, also known as transboundary crises (Roe, 2009; Wachtendorf, 2009), apart from the traditional brethren because it can easily cross geographical borders, threatening multiple organizations, independently of their regions, countries and continents.

This notion of transboundary crises exceeds the possibilities of the signal detection approach and emphasizes the virtues of the high reliability approach (La Porte, 1996; Schulman, 1996). This second approach for crisis management practices focus on organizational resilience, in spite of anticipation (Roe & Schulman, 2008; Shrivastava et al., 2009). As the crisis boundaries cross the organizational geographical borders, the lessons for crisis identification and isolation become more difficult to manage. Besides, as the new set of crises have no clear beginning, escalate suddenly and in unforeseen directions, exploit linkages between functional and geographical domains, the signal detection mechanisms usually perceive the crisis with a dangerous delay (Boin & Schulman, 2008). Because of that, it is necessary to maintain an underlying style of mental functioning that is distinguished by continuous updating and deepening of increasingly plausible interpretations of what the organizational context is, what problems define it, and what remedies it contains, in order to

quickly perceive any kind of crisis, understand it and adopt the necessary responses (Roe & Schulman, 2008; Weick & Sutcliffe, 2001).

We defend that organizational anticipation is important for crisis management, but we must have the resilience to bounce back from the threats we cannot anticipate. It is important to understand that emerging crises demand the ability to spot the signs of phenomena that cannot be represented by any known model, and organizations must perceive the approaching of crises that have never been previously identified (Lagadec, 2009). Crisis situations force organizations to swiftly make sense of turbulent environments that are often unlike anything they have previously experienced. Organizational routines and understanding that work well under normal conditions usually fail during crises (Roberts, Madsen & Desai, 2007). To successfully manage crises, organizations must develop the capability to rapidly assimilate information from many disparate sources into a coherent picture of the developing situation. It shows the importance of developing well-refined sensemaking capabilities.

2.2.2 Organizational Sensemaking as a learning process

Sensemaking is the process through which members of organizations subjectively construct the reality in which they operate (Weick, 1995). We agree with the sensemaking perspective, which argues that people are constantly in the process of constructing realities based on their perceptions and experiences. So, every sensemaking process brings new knowledge and consists in a learning process. In organizations, reality is constructed by organizational members, as they develop and learn togehter shared understandings of the world and of the organization (Weick, 1995). If we adopt an understanding that a crisis involve rapid and unfamiliar changes in the organizational environment, which cannot be reconciled with existing mental models, effective response to the developing crisis requires new learning processes, forcing organizational members to quickly construct new mental models of the crisis situation. It is necessary to grasp the crisis while it unfolds and learn new ways to manage the crisis and respond to it (Weick, 1988).

Our approach identifies these sensemaking processes during crisis events as a great opportunity for organizational learning and we think that organizations should recognize these learning gaps. We suggest that leaders can structure their organizations and train their employees in such a way that rapid sensemaking and learning in crisis could be possible. Besides, we also defend that, when an organization is prepared to maximize the sensemaking processes during crisis episodes, they will also be prepared to increase the levels of organizational learning during its ordinary state, without a crisis.

3 Organizational Learning in crisis situations

Organizations must always confront novel aspects of their contexts and it is widely agreed that organizational learning consists of two kinds of activity. The first kind of learning is obtaining know-how in order to solve specific problems based upon unique premises. The second kind of learning is establishing new premises to override the existing ones (Argyris & Schön, 1996; Nonaka & Takeuchi, 1995). This distinction in organizational learning literature can also be divided between single- and double-loop learning. Single-loop learning is instrumental learning that leads to improvement in the performance of organizational tasks without changing the values of a theory (Argyris & Schön, 1996). In the context of organizational activity, single-loop learning is appropriate for routine, repetitive operations, allowing organizations to do the same things better. On the contrary, double-loop learning is the learning that results in a change in the values of theory-in-use, as well as in its strategies and assumptions (Argyris & Schön, 1996). In the organizational reality, double-loop learning happens when organizations change their basic assumptions in such a way that underpin their mission and key policies.

Organizational learning is seem to occur when experience systematically alters behaviour or knowledge (Schwab, 2007). As a crisis brings new circumstances for the organizational context, it represents an opportunity for organizational learning. Indeed, we will assume that crisis learning is defined as the collective identification and embedding of practices and behaviours that improve crisis response (Moynihan, 2009). The crisis management literature has identified organizational learning as a central role for crisis response and recovery (Boin et al., 2005; Lagadec, 1997; Roux-Dufort & Metais, 1999). However, it is important to understand that this literature identifies two types of crisis learning, intercrisis learning and intracrisis learning (Deverell, 2009; Moynihan, 2009). Depending on the crisis management approach adopted in one organization, it will emphasize one or another type of crisis learning.

Intercrisis learning is originated from the signal detection approach and is characterized as the learning from one crisis to prepare for another (Moynihan, 2009). In this way, intercrisis learning begin to happen after the crisis has ended, when organizational actors seek for potential lessons, in order to prepare new contingency plannings and train for future crises (Boin et al., 2005). We can speak of intercrisis learning as a single-loop learning process. On the other hand, intracrisis learning represents the learning that seeks to improve response during a single crisis episode (Moynihan, 2009). As it looks for organizational resilience during a crisis, it is a practice commonly identified in the high reliability approach.

In this way, this kind of learning happens in accordance with the crisis evolution, in order to construct particular responses for each crisis constraint. Then, we can speak of intracrisis learning as a double-loop learning process.

3.1 The limitations of Intercrisis Learning

The discipline of intercrisis learning reflects the overwhelming tendency, in both theory and practice, to view crisis management as a holistic process involving prevention, planning, acute response, recovery and learning (Fink, 1986). We consider that this Cartesian approach is no longer enough to effectively respond to crisis, as it is normal for leaders to deal with the unexpected (Weick & Sutcliffe, 2001). In such a context, preventing all extreme threats from materialising is not only implausible, it is simply impossible (Wildavsky, 1988). Prevention requires that one knows the source and dynamics of threats, but literature shows that this will be very difficult in the 21st century's crises (Lagadec, 2009).

Besides, crisis management based on intercrisis learning recommends the use of contingency planning. We think that this kind of document is necessary, but not sufficient. Of course, there is much to be gained from the prior specification of roles and responsibilities, but planning is no panacea in the case of crises. In fact, planning for a crisis is almost a contradiction because the crisis' constraints violate the regular patterns upon which planners rely in order to prevent it (Boin & McConnell, 2007). To make it more difficult, there is the issue of the ever-growing complexity of social, corporate, industrial, financial, infrastructure and administrative systems, and their growing tight coupling.

Practicing intercrisis learning has the effect of rendering infrastructural breakdowns as a problem for all of these systems, as well as for their leaders and stakeholders. As a power blackout, for example, offers constraints for a whole community, it is quite impossible to plan roles and responsibilities separately for each group involved in the crisis resolution. At least, there is the limitation represented by top-down responses based on intercrisis learning. In times of extreme threats, power and authority tend to shift up hierarchies (Rosenthal et al., 2001). However, in most cases, the crisis response involves technical and operational data that is not easily accessible to leaders. It makes normal the adoption of wrong actions because leaders are possessed by a sense of urgent, and they think that they must act quickly, even without all information.

As an example, we can cite a recent power outage that took place in 18 states of the complete brazilian country (Goy & Andrade, 2009). In spite of all the contingency plannings, developed separately by each state, the participation of engineers and researchers, and the involvement of a great number of public authorities, the blackout remained for more than 20

hours and its reasons are still unknown. There are a lot of controversies between researchers and authorities, debating the causes of the outage, and even after eight months of studies, the blackout's reason is not clear (Portella, 2009). Public leaders insists on the thesis that the bad weather and a great storm was the cause of the blackout, while researchers defend the idea that the outage was caused by the lack of maintenance in the transmission lines (Pontes, 2009). In this case, the absence of intracrisis learning slowed the crisis response and made more difficult the communications between the parties involved in the crisis solution. Besides, even the intercrisis learning remained prejudiced because of the existence of divergent ideas.

3.2 Benefits from intracrisis learning and its challenges

Intracrisis learning is different from intercrisis learning, as it promotes the creation of knowledge about the crisis while the constraints are happening, in spite of waiting the crisis resolution to promote learning (Moynihan, 2009). We have seen that the tradition view on crisis management consider that learning from crisis is usually the result of some sort of investigation and study activity, that take place only after the crisis termination (Boin, McConnell & 't Hart, 2008; Deverell & Hansén, 2009). Nevertheless, we defend that learning should not be seen as an outcome or a goal after the crisis. It should be considered as an ongoing activity within the crisis resolution process because the the shape and dynamics of crises is changing. This means that the next crisis will not have the same causes and characteristics than the previous one. In this way, intercrisis learning from one crisis to another may not be sufficient to address the new crisis and quickly respond to it.

Instead of adopting only the operational perspective on crisis management, the new set of crises show that the political-symbolic perspective is also important. Organizations will not genuinely move forward on crisis management if they fail to understand that no ready-made answer can be the solution to modern crises (Lagadec, 2009). Emerging crises demand the ability to create a meaning and learn specific lessons for each crisis, and rapidly communicate it through the whole organization. These sensemaking processes and intracrisis learning are intertwined phenomena.

Intracrisis learning promotes a constructivist model to crisis response and emphasizes a creative approach to deal with crises. It focuses on openly thinking about unreadable situations, in order to particularly understand each constraint and formulate a customized answer to different crises. Institutionalized intracrisis learning helps organization to avoid two pitfalls that are always present in extreme crises: (1) bureaucratic inertia, where each organization waits until the crisis fits its codes and rules (Elliott, 2009); and (2) the general loss of nerve, not only with external stakeholders, but along the entire chain of command

(Mitroff, 2007). We understand that intracrisis learning should be encouraged and disseminated beyond the whole organization so that a creative approach will be embedded in the organizational, administrative and institutional culture.

However, this is not an easy task. Intracrisis learning may be more difficult than intercrisis learning. In a post-crisis situation, the meaning of the event has already been defined. Besides, an after-action report can carefully collect and examine relevant information, make recommendations for the future and offer suggestions for other actors on how to perform better or which policies to implement (Moynihan, 2009). On the opposite, during a crisis situation, actors must engage in sensemaking and learning under limited time, dynamic conditions, and intense pressure, investigating the nature and scope of a crisis and searching for an appropriate response (Boin et al., 2005; Lagadec, 1997; Weick, 1988). They cannot make vague recommendations of policy suggestions for a distant future. On the contrary, they must implement whatever changes they can, immediately.

Moynihan (2009) points out three key challenges for an institutional adoption of intracrisis learning: (1) a mismatch between information and task; (2) cognitive limitations; and (3) political barriers to learning. The first challenge emphasizes that, even as crises make learning difficult, they demand that decisions must be made. The urgency can lead to ill-considered lessons and create a tension between the knowledge processed during the sensemaking processes and the decisions that have been made (Boin et al., 2005). The second challenge is related to crises' tend to narrow focus and limit information processing. New, unexpected, and threatening conditions weaken the capacity of individuals to make sense of new contexts , learn with it, and develop adaptive solutions (Weick, 1988; Weick & Sutcliffe, 2001). The third challenge shows that crises are politically salient events. It means that intracrisis learning occurs in a political context and actors must make decisions that fit within a broader frame of organizational policies and political accountability. This can shape how responders make decisions and interact with one another (Boin et al., 2008).

In order to institutionalize intracrisis learning, organizations have to break through the conventional limits, to slip across old costumes and invent new collective responses, even against several challenges. Organizational crises pose a lot of problems that put at stake important values and issues. When it happens, determined personal and direct involvement from the top of the organization can play a relevant role. Emerging crises demand leaders: questions of vision and policy come to the fore. Leadership must get involved into the sensemaking and learning processes that will lead to adequate response. As people experience crises as episodes of threat and uncertainty, as a grave predicament requiring urgent action

(Rosenthal et al., 2001), it is a natural inclination in such distress to look to leaders to "do something" (Boin & 't Hart, 2003).

The literature about crisis and leadership suggests that crises may significantly affect the relationship between leader and followers (Halverson, Murphy & Riggio, 2004; Pillai, 1996). In this way, organizations should take advantage of this characteristic and view leadership as an intracrisis learning trigger, with the aim to institutionalize an organizational culture of learning with crises, in order to respond to them.

4 Bridging the Gap: Crisis Leadership as an Intracrisis Learning Trigger

Even in the absence of hard and fast rules for judging successful coping patterns, it is clear that leadership can prove a crucial factor in facilitating an effective operational crisis' learning and response, as well as managing the fears and anxieties that typically accompany crises and infrastructural breakdowns. We will define as crisis leadership any attempt to influence people in order to respond to a crisis (Mitroff, 2004).

Boin *et al.* (2005) developed a model for crisis leadership as five critical tasks. These authors defend that crisis leadership involves sense making, decision making, meaning making, terminating and learning. Sensemaking means that public and organizational leaders must recognize from vague and contradictory signals, grasping that something out of the ordinary is developing and "making sense" of what is happening (Boin et al., 2005; Weick, 1988). Then, leaders should decide how to respond to the crisis. Crisis decision making offers hard calls, which involve tough value tradeoffs and major political risks, requiring flexibility and improvisation (Boin et al., 2005; Sommer & Pearson, 2007). After deciding how to respond to the crisis, leaders are expected to reduce uncertainty and provide an authoritative account of what is going on, why it is happening, and what needs to be done, in order to impute "meaning" to the unfolding crisis for all stakeholders, in order to enhance leadership's efforts to manage the crisis (Boin et al., 2005). Finally, it is time to put in practice the deliberated decisions, terminate the crisis and learn with it, observing the potential lessons for contingency planning and training for future crisis.

Although this model for crisis leadership is complete and clear, it is important to emphasize that it uses the concept of intercrisis learning (Moynihan, 2009). We think that the use of crisis leadership models based on intercrisis learning are no longer enough to successfully respond to crises in today's age of high-speed and global mass communication. As the shape and dynamics of crises is changing, the learning processes involved in the crisis response should not wait for crisis termination. Despite waiting, these learning processes must be constant and related to each one of the five tasks commented above.

Trying to maintain constant organizational learning during crisis episodes, we will follow a theoretical perspective in which the leaders must mobilize their communities and organizations during these different crisis leadership's tasks, looking for possible lessons that could be learned in every situation, and not only after crisis terminating. This approach is based on intracrisis learning and put leadership as a central role to leverage the occurrence of learning processes related to the crisis. We are not developing a normative theory of leadership for promoting intracrisis learning. Instead, our intent is to show the relevance of leadership efforts in order to implement institutionalized intracrisis learning. We seek to set the stage for advancing future research by formulating lessons that may enhance organizational and societal preparation for intracrisis learning during critical infrastructural breakdowns. With that aim, we perused the organizational learning and crisis management literature and organized a theoretical framework, composed of six lessons to promote leadership as an intracrisis learning trigger, as summarized in Figure 1. We understand that the adoption of these lessons will improve organizational preparation for crisis management and, maybe more relevant than that, will contribute to the adoption of a institutional learning culture, that will be present in both regular and turbulent times.

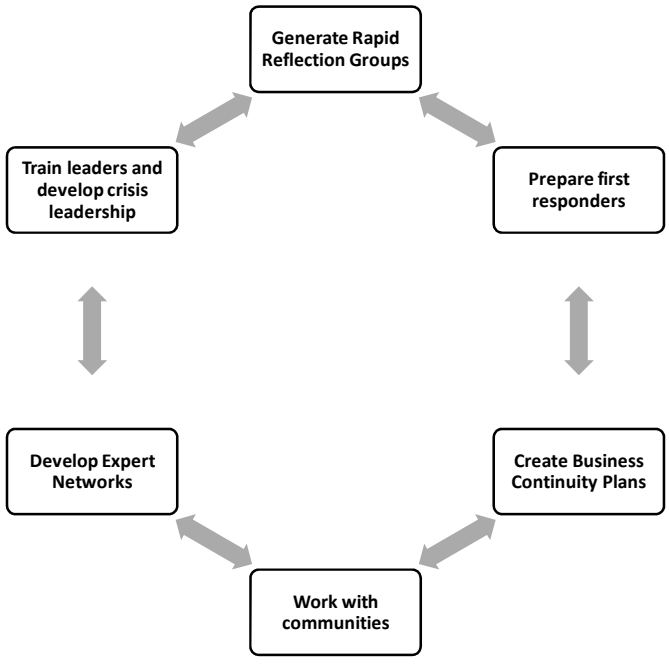

Figure 1: Theoretical framework to promote leadership as an intracrisis learning trigger.

4.1 Generate Rapid Reflection Groups, in place of post-crisis accountability systems

Crises have a way of becoming politicized rather quickly. Some actors perceive a threat to their ways of working, policies and legitimacy, yet others relish the prospect of change. Political, bureaucratic, economic and other special interests do not automatically pull together and give up their self-interest just because a crisis has occurred. They engage in a struggle to produce a dominant interpretation of the implications of the crisis (Boin et al., 2008). This politicization tends to evolve around two core processes, related to accountability and learning. However, it is common to observe that organizations overvalue accountability systems rather than learning processes. Organization actors tend to play blame games, in detriment of trying to understand the events.

In order to minimize this skewed tendency and promote relevant learning, we recommend that organizations should develop the creation of groups of people that are familiar with engaging chaos and who are given to thinking openly in unreadable situations. This is essential for overcoming politicization of crisis situations. These Rapid Reflection Groups would be forged to avoid any kind of sensemaking manipulation and would involve a constant battle to frame, detect and understand the nature of unfamiliar situations, trying to grasp all the essential issues at stake in a crisis and develop fast and reliable intracrisis learning processes.

4.2 Prepare first responders, instead of top-down answers

Work-group learning requires a number of behaviours that include seeking feedback, sharing information, asking for help, talking about errors and experimentation. It is through these activities that groups can detect changes in the environment and learn from it. If an effective response to an infrastructural breakdown depends on the performance of first line operators, these people must be identified and trained to act independently and effectively in dire circumstances, in order to feel capable to operate “in the dark”, respond quickly to any changes in the environment, and notice the leaders about what occurred.

4.3 Create Business Continuity Plans, in place of only contingency plans

Instead of focusing on what to do to respond to a crisis that has not been fully understood, leaders should focus on what to do to maintain things working. It is important to create awareness of vulnerability, as an infrastructural breakdown typically has a devastating impact on local businesses (Tierney, 2006). Leaders, then, should encourage all stakeholders to develop a business continuity plan. For doing so, it could be adopted complex models, which direct more details and register more facets of context. Then, organizations will

continue their operations while the Rapid Reflection Groups mobilize grasp the crisis and help leaders to implement the needed responses.

4.4 Work with communities, not against them

Partnership should be developed prior the occurrence of an infrastructural collapse. In this way, government, business, citizens and media can facilitate an "organic" community response to the breakdown. This "organic" community could involve private owners of Critical Infrastructure Systems, as it is common in most western societies. Besides, communication channels should be constructed among all stakeholders involved in a possible crisis. It may create an error-friendly learning culture, as a sense of ownership over plans could be constructed, and encourage alternative frames of reference, even though only to a small degree. Learning forums could be stimulated before crisis' occurrence, such as dialogue routines specifically focused on solution-seeking, which treats all unexpected events as information, sharing it widely. This practice has the virtue to explore different perspectives on the same event and will help the Rapid Reflection Groups and organizational leaders to constantly update their perceptions.

4.5 Develop expert networks, not bureaucratic ones

Every breakdown will require some form of expertise to inform critical decision-making. If leaders wait until a breakdown occurs, they will not have time to verify the background and qualities of experts. Examining experts and building trust relations should be done beforehand. In this way, when a crisis occurs, this network would be quickly activated, in order to develop learning under uncertainty (Moynihan, 2008). In operational terms, leaders must have at hand people who are familiar with engaging chaos and who are given to thinking openly in unreadable situations. This practice is very important in order to maintain a constant and institutionalized view of organizational learning.

4.6 Train leaders and develop crisis leadership as an intracrisis learning trigger

Political and organisational leaders need to develop their capacity to mobilize intracrisis learning in times of infrastructural breakdowns. For doing so, they must avoid traditional leadership pathologies in crisis situations, such as: playing "blame games", sticking with the plan, waiting for all facts to make decisions, treating the media and researchers as enemies, among others. Leaders must understand that they must make critical decisions without sufficient or adequate information and they must enable cooperation between the various stakeholders involved, organizing communications streams within and across the crisis management network as well as with the outside world. Their main role is to

mobilize people to practice intracrisis learning in order to grasp the contingencies and act successfully upon them.

5 Final Considerations

This paper sketches a theoretical perspective that focuses the crisis leadership as a central role to promote the adoption of intracrisis learning in organizations and societies. This is a difficult endeavor because in many cases the occurrence of a crisis is perceived with delay. For that reason, we considered the case of critical infrastructural breakdowns to formulate lessons that may enhance organizational and societal preparation for intracrisis learning. Mobilize people to practice intracrisis learning is a tough calling because the crisis itself brings a lot of contingencies that can confuse political and organizational leaders. Besides that, the theory and the practice of crisis management and leadership have the overwhelming tendency to adopt Cartesian models and mechanisms that overestimate the potential of intercrisis learning, without focus on the lessons that could be learned while the crisis unfolds. To fulfill this gap in the literature and practice of crisis management, we present six lessons to demonstrate how the leaders can stimulate the adoption of intracrisis learning in order to improve societal and organizational responses for infrastructural breakdowns. Finally, although more studies are needed to verify and ascertain our conclusions, this paper contributes with the study of organizational learning because it presents an innovative theoretical perspective, which focuses the crisis leadership as a central role to promote the adoption of intracrisis learning in organizations and societies.

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