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INVITED ESSAY

AFTER FUKUSHIMA: REFLECTIONS ON RISK AND INSTITUTIONAL LEARNING IN AN ERA OF MEGA-CRISES

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Triggered by the recent inquiries into the Fukushima nuclear disaster, this article reflects on the challenges of developing and operating risk regulation and crisis management regimes in an era of highly complex and tightly interconnected socio-technical systems. These challenges are not just technical and professional but fundamentally institutional and cultural. The article identifies three key paradoxes and challenges of contemporary risk and crisis management, signals a range of recurrent problems in governments' efforts to cope with these challenges, problematizes current patterns of societal learning from crises, and sketches an agenda for public administration research in this area.

FUKUSHIMA: A RUDE AWAKENING

On 11 March 2011, a massive earthquake followed by a tsunami hit Japan's northeast and overwhelmed the authorities. This natural disaster escalated into a compound crisis when the Fukushima nuclear power plant flooded, triggering a series of power and equipment failures, explosions, nuclear meltdowns, and eventually a release of radioactive materials. The crisis exposed the limits of nuclear power regulation and crisis preparedness in one of the most technologically advanced countries on earth. It is an example of a disaster that turns into a calamity of much bigger temporal, spatial, and political proportions.

The subsequent inquiries uncovered a range of institutional vulnerabilities: all too cosy regulator–industry relations in the so-called 'nuclear village'; a less than vigorous safety culture within Tepco, the mammoth power company operating the plant; a tacit but widely shared cultural illusion of Japanese superiority in all technological and therefore also nuclear matters; a collective 'willing away' of the reality that the national energy strategy had become hostage to a technology that is fundamentally high-risk and never fully tameable; and local communities being economically dependent on the very high-risk facilities in whose shadows they live (National Diet of Japan 2012).

Appropriate rules and structures *seemed* to be in place, and responsibilities for preparedness and response were formally allocated across a wide range of government authorities. But the plans which called them into existence proved to be 'fantasy documents' (Clarke 2001): paper-driven exercises in wishful thinking that bore no correspondence to the much more fickle and vulnerable on-the-ground realities of risk management and crisis preparedness. Cutting through all the ritual word games, the essence of the planning appeared to be:

1. This is not the USA or Russia: nothing will ever happen.
2. If something did happen, we will contain the incident on-site.
3. Therefore we need not plan for what might happen if we cannot.

For those who placed their belief in these plans, the reality of Fukushima was a rude awakening.

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The crisis also highlighted the frailty of the Japanese government's approach to crisis management. Interdepartmental and intergovernmental collaboration in the response effort broke down. This was due in part to the devastating infrastructural damage wreaked by the quake and the water, but also to the sheer complexity of Japan's nuclear incident management and regular emergency management structures. The uneasy co-existence of these two subsystems, each with their own command hierarchy, language, and practices, severely impaired the effectiveness of the crisis response.

The situation furthermore was not helped by the strongly top-down, micromanagement-focused leadership style of Japanese prime minister Kan. His energy, dedication, drive, and stamina were admirable, but his tendency to shoot from the hip, involve himself in operational detail, and his opinionated and vocal modus operandi had some clear drawbacks. It certainly did nothing to enhance the speed and flexibility of governmental crisis decision-making, nor did it provide a helpful route to obtain cabinet and broader political support for the far-reaching and controversial decisions that were deemed necessary. It moreover made it difficult for his colleagues and associates to 'speak truth to power' and advise him of things he did not want to hear or considered substandard – as evidenced by his harsh dressing down of the head of the Japanese nuclear regulator during the crisis (Independent Investigation Commission of Fukushima Nuclear Accidents 2013).

Moreover, the prime minister's emphatic reluctance to engage with the press resulted in a hitherto unknown cabinet official becoming the public face of the government's response. Given the circumstances, he performed admirably in the role, but could not stem the groundswell of criticism about the government's handling of its regulatory responsibilities and the many inconsistencies, the lack of clarity and consistency, and the inexplicable delays in its public information provision. As a result, the government lost control of the public meaning-making process and progressively lost support in the weeks and months following the acute stage of the emergency.

The common interest in preventing future Fukushimas is best served by institutional learning processes that are not dominated by the spiral of shock–accusation–defensiveness–avoidance that we often see in the wake of a major and mishandled emergency (Smith and Elliot 2011). Post-Fukushima policy commitments in Japan and Germany to abolish nuclear energy were stated while that spiral still reigned supreme. These decisions certainly constitute a radical way of eradicating risks. But phasing out nuclear power is a big policy gamble (Dror 1986), particularly in Japan, where the search is now on for a sustainable energy future without the current strong reliance on nuclear power. And even as they gradually abandon nuclear energy generation, countries like Japan and Germany still face several decades of having to contend with its risks.

In this article, I present a number of strategic challenges in risk management and emergency planning, which policymakers around the world can ignore or downplay only at their societies' peril. I also present a number of avoidable yet common pathologies of risk management and emergency planning, whose eradication is necessary to enhance institutional and community resilience in the face of the inescapable downsides of relentless modernization. The article concludes with an agenda for public administration research into this at once classic and rapidly evolving area of government and governance.

PARADOXES AND CHALLENGES

There are no easy solutions for those trying to 'learn the lessons' of Fukushima. The job at hand entails not just technical work for a specialist community of expert risk regulators

and emergency managers. It involves a society-wide process of what Ronald Heifetz (1994, p. 22) has called adaptive work: the learning required to address conflicts in the values people hold, or to diminish the gap between the values people stand for and the reality they face. That reality is one of a high-tech, globalized, interconnected world that enables great innovation and prosperity but also produces and amplifies potentially cataclysmic risks (Beck 1992, 1998, 2009).

The potential lessons of Fukushima thus reach well beyond the nuclear power debate. They challenge not just Japan but all advanced societies to re-examine their ability to harness technology whilst at the same time guarding more effectively against its unintended consequences. Developing and maintaining effective risk regulation and crisis management regimes within and across a wide range of industry sectors, localities, and governmental jurisdictions is a *sine qua non* of achieving these twin objectives. Yet trying to do just that leads a society to face up to a number of key paradoxes of reflexive modernity. The first paradox is that *there is no inherent relation between objective and subjective risk* (Douglas and Wildavsky 1982; Gardner 2009; Ropeik 2010; Rothstein and Downer 2012). For any group, its level of concern about the risks it faces provides the major impetus for its investment in safety and security. Yet that level of concern may be out of kilter with what knowledgeable and dispassionate observers would describe as the actual nature of the risks the group faces. There are many potential discrepancies between the two, each of which leads to undesirable consequences.

One such discrepancy is *risk inoculation*. People may not appreciate the risks they are exposed to, and may therefore not be motivated to invest in risk prevention, mitigation, and preparedness. This can be the result of many factors. On the supply side, public perceptions of risk can be manipulated by lack of transparency or purposeful 'framing' on the part of risk-producing or risk-regulating entities. On the community side, a collective illusion of invulnerability ('it won't happen here') can take hold after years of 'incident-free' living, giving rise to the belief that existing risk regimes must be sufficient whereas in reality they have been largely untested or unobtrusively eroded. A corollary of this type of misperception is what Rosenthal (1988) has called the vulnerability paradox: the more invulnerable a society has seemingly become, the more vulnerable it will prove to be when a major incident does occur. Put differently: the more a risk management regime has banked exclusively on prevention, the less resilient system operators, communities, and governments will prove to be when the need for it arises (Wildavsky 1988).

Another such discrepancy is *risk inflation*: societies or companies that obsess about risk and danger and therefore are prone to engage in over-regulation, at great opportunity costs. According to German sociologist Ulrich Beck (1992), this is what has happened throughout the Western world. In so-called risk societies there is a widespread preoccupation with vulnerability, including the negative external effects accruing from technologies designed to sustain our modern, urbanized lives and to allow firms and consumers to thrive in the global economy. When the perception of danger becomes inflated on the back of questionable empirical evidence, forms of regulation, mitigation, and preparedness may be called into existence that do not discernibly enhance safety and security yet impose great economic costs or curtail rights and liberties. The latter occurred, the critics argue, in the wake of 9/11 when many Western governments adopted far-reaching anti-terror legislation and greatly expanded their institutional capacities for counter-terrorist intelligence and crisis management operations (Furedi 2005, 2007).

Accordingly, when the 'true risks' that a community runs are essentially contested, the occurrence of low-probability, high-impact contingencies like Fukushima throws up

challenges to institutional learning capacity. Policymakers have to dodge the danger of 'not learning', for example because the power of status-quo interests proves to be bigger than the groundswell of support for change. That danger always exists – certainly so in societies and policy sectors whose economic and governance structures lack the built-in pluralism, transparency, and accountability that make the relevant elites appropriately agile in the face of critical disturbances and contain mechanisms capable of generating robust negative public feedback about the performance of existing systems and incumbent elites. Lacking such checks and balances, even massive disasters like the ongoing financial crisis can be conveniently explained away by institutional elites as having been a 'one of a kind' extreme event whose likelihood of reoccurrence is extremely low. This paves the way for continued complacency masked by symbolic gestures designed to allay 'irrational' fears of the masses and reduce short-term political pressures; it does not address the more difficult underlying policy predicaments and power relations (Edelman 1971, 2001).

At the same time, there is also the opposite danger of undue risk amplification providing momentum to what one might call 'over-learning' the ostensible 'lessons' of truly scary emergencies such as 9/11, Katrina, and Fukushima. Over-learning occurs when the virtues of a no-regret, zero-risk approach are extolled to the point of it becoming an overbearing ethical or political imperative crowding out rational debate about the full societal cost–benefit ratio associated with such policies. In his controversial but now classic *Searching for Safety* and *But Is It True?*, Aaron Wildavsky (1988, 1995) showed us how such a mobilization of bias in favour of unnecessarily restrictive risk regulation may occur, and the perverse unintended consequences it may generate.

To avoid these unhelpful extremes, crisis-stricken communities need to prudently manage the 'crisis after the disaster', to provide the best chances of a balanced learning process occurring. They need institutions and practices of 'looking back' at near misses and crises that induce a form of collective puzzlement which does not place the twin tasks of shouldering blame for the past and designing reform for the future exclusively at the feet of government and industry. Putting the onus of adaptation entirely on them is what Heifetz (1994) would call a form of 'work avoidance' of citizens whose own beliefs, priorities, and behaviour as consumers (and as voters) more often than not have helped bring about the very man-made risks they now want eradicated from their lives after the traumatic experience of a recent major crisis. Societies as a whole must develop a capacity for self-reflection.

The need for such a wider learning agenda is highlighted by the second paradox discerned here, which is that *many of our most sophisticated socio-technical systems are also our greatest risk amplifiers*. Nuclear power stations are not the only technological system that has catastrophic potential. There are plenty of other such systems, including petrochemical installations, power grids, water systems, the industrial food chain, urban mass transport systems, nuclear aircraft carriers and submarines, the internet, satellite communications, and – as we have seen in recent years – the global financial system. These systems are crucial in sustaining our cities, countries, and economies.

It is to these systems that Perrow's (1984) prophecy constitutes a fundamental challenge. Perrow argued that in such systems foolproof failure prevention is impossible because of their inherent complexity. When one of their parts fails, real-time escalation processes are set in motion by the proliferation of tight couplings between their constituent components (see also Van Eeten *et al*. 2011). This makes it an extremely tall order to contain accidents occurring in these systems (Perrow 1984, 2011a). It made the Fukushima disaster an inevitable and therefore 'normal' accident, Perrow (2011b) grimly concludes. Perrow's

(2011a, 2011b) policy implications are radical: if we want to prevent catastrophic incidents like Fukushima, we need to both fundamentally reconsider our reliance on these systems and accept that mitigating the risk of catastrophic failures might involve far-reaching and costly regulatory interventions as well as drastic changes to spatial planning and land use.

The conundrum raised by Perrow's prophecy is stark. These systems have become part of the DNA of successful capitalist societies. Reducing their internal complexity and releasing the tightness of the couplings between their components and between them and other systems entails major costs. This goes for corporations that own and run them, for the economy as a whole that will forego efficiencies and see growth diminished, and for citizens who will experience noticeable changes to the availability and costs of the efficiency-driven urbanized and globalized lifestyles they have become accustomed to.

Because the implications of going down Perrow's road are so unpalatable to many, the search has been on for an alternative way of tackling the risk amplification potential of high-tech industrial and infrastructural systems. Hence the European Commission – ever on the lookout for an opportunity to make inroads into hitherto fairly impenetrable national risk policy monopolies – has hastily undertaken 'stress tests' of all nuclear facilities within the EU. Hence the wider quest for 'reliability' and 'resilience', which are long-established notions in engineering but in recent decades have become buzzwords among students and practitioners of safety and security management (Comfort *et al*. 2010). The two concepts are closely related. Reliable components remain fungible and safe even under extreme operating conditions; resilient systems are able to bounce back vigorously from major disturbances well short of collapse.

There are alternatives to Perrow's categorical regulatory absolutism. Three decades of intensive observational research on a range of organizations managing high-risk systems in a nearly error-free fashion suggest that achieving high levels of reliability and resilience is not just a matter of the technical design of industrial and organizational 'hardware', but involves meticulous dedication to 'soft' factors: staff training, work process design, group culture, and leadership styles (Weick and Sutcliffe 2007; Roe and Schulman 2008). Creating and sustaining a dedicated safety culture both reduces the chances of human errors creating accidents and improves the capacity of organizations to effectively mitigate and thus contain the escalation potential of disruptive incidents.

In contrast, cultures of complacency – often built on a mythical belief in perfect prevention – form a recurring factor in investigations of man-made disasters (Turner and Pidgeon 1997). Such complacence is deeply at odds with a mental state of permanent weariness and dedication to fault-finding that characterizes the culture of high-reliability organizations. Likewise, existing proclivities for planned, orderly, and above all top-down, centralized modes of decision-making among key corporate and governmental actors run against the principles of resilient incident management, which emphasize decentralization, local knowledge, and deference to experts by management – all factors that enhance an organization's capacity for effective improvisation in real time. Resilient incident management is especially important in the face of deeply surprising and fast-moving events, when centralized systems tend to become overloaded, delay action, and locate authority in people lacking an adequate understanding of operational realities. Hence, because perfect prevention is an impossibility a key risk management challenge is to transform corporate, industrial, and governmental cultures into adaptive systems where this type of improvised problem-solving behaviour is actively nurtured and protected.

The third paradox to be discussed here is that *community self-organization and empowerment are at once the most pivotal to and at the same time the least developed components of effective risk and crisis management strategies*. Governmental attitudes towards at-risk citizens and communities are often pervaded by counterproductive paternalistic instincts. These may spring from the best of intentions, rooted in a belief that 'the public' is panic-prone – unable to rationally handle information about threats and danger. In reality, there is not a shred of scientific evidence that 'the public' is indeed likely to panic – quite the contrary (Clarke 2002; Drabek 1984). Or, as others like to see it, elite tight-lippedness and preference for top-down solutions in times of crisis may spring from self-serving motives: to hide evidence of incompetence, collusion, or corruption. It may even be the result of an opportunistic political stratagem to 'shock and awe' citizens with bad news at a time of the authorities' own choosing designed to further their own policy aims rather than assist the victims of disaster (Klein 2007). Whatever the driving motives, elite paternalism manifests itself in a reluctance to share information about an impending or current emergency in a timely and comprehensive fashion.

In response to the resultant vacuum of official information, citizens turn to alternative sources providing quicker and seemingly more poignant information. They rely on mass media and on suggestions from trusted and liked sources in their own local and virtual networks to make their choices about what to do when they are hit by a crisis. This may make them seem to act 'irrationally' from the perspective of government officials, which makes them even more reluctant to dispense public information fully and in real time. As a result, citizens can lose trust in the government's competence and/or its integrity, further diminishing government's ability to steer (or nudge) community behaviour in desirable directions.

Such self-reinforcing cycles of government miscommunication and citizen 'irrationality' marred the dysfunctional disaster response operations in New Orleans (Hurricane Katrina) and Fukushima. And this we will continue to see until governments and corporations switch towards more proactive, transparent, and simply smarter risk and crisis communication strategies.

ARE GOVERNMENTS UP TO THESE CHALLENGES?

Governments focus much of their risk management and emergency planning efforts on what one might call the range of 'routine' emergencies, those that have occurred before and are likely to periodically reoccur given a jurisdiction's geographical, economic, and social structure. But when it comes to large, transboundary, compound, or fast-moving threats such as Hurricane Katrina, veterinary as well as human pandemics, the Boxing Day Tsunami, the Icelandic volcanic ash cloud, and the 2011 Japanese catastrophe, the limitations of response capacities and patterns are quickly exposed (Ansell *et al*. 2010; Mitroff and Alapaslan 2011). These types of crisis reveal institutional vulnerabilities – which Barry Turner (Turner and Pidgeon 1997) called 'blind spots'. These blind spots bedevil corporate and governmental emergency managers when low-probability, high-impact contingencies occur despite all efforts to prevent them from happening. These vulnerabilities need to be understood and addressed in order to match capacity for resilience to the requirements of 'mega-crises' (Helsloot *et al*. 2012). Let me briefly outline a few key problems below.

Self-defeating plans

The pervasive surprise, uncertainty, and overwhelming scale that characterize mega contingencies shatter the basic presumptions of most existing emergency plans. This is

not to say that all emergency planning is useless. On the contrary, when done properly it serves important start-up and network-building functions (see further below). But, as we have seen in the brief account of the Fukushima crisis with which I began this article, by attaching too much value to the plan as document, a false sense of security can emerge among policymakers and first responders alike.

Fantasy documents underrate the damage and chaos that some crises and disasters entail, and overrate the capacity of organizations and governments to quickly and effectively minimize their impact. They do not consider worst-case scenarios. They suffer from an availability bias in risk selection, in that they are unduly focused on a narrow set of seemingly most salient local contingencies (e.g. floods in Bangladesh, winter havoc in northern Ontario, terrorist attacks in Washington, DC, bushfires in Victoria). This leaves the outer registers of the risk catalogue unaddressed, setting up the system for surprise and shock when these rather than the envisioned scenarios materialize (Taleb 2010).

Communication breakdowns

Crisis management critically depends on smooth communication flows within and between organizations. During crises, however, communication often breaks down for a variety of reasons, only some of which are purely technical (such as equipment failure). The most debilitating communication barriers are cultural: lack of pre-existing communication channels and routines; lack of trust between organizations; predominance of narrow, mono-disciplinary or localized definitions of what is going on; and what is important to know and divulge to others.

The 'blind spot' here is to approach emergency planning as a purely technical, routine, and highly hypothetical matter rather than treating it as an integral, strategic part of corporate and government policy at all levels. Such a mindset avoids addressing the inherent tensions between the needs and imperatives of regulators and regulatees, different professional paradigms, and different jurisdictions. It is precisely these tensions that come to the fore during a crisis and greatly inhibit the mutual transparency and trust required to coordinate and collaborate productively (Millar and Heath 2004; Sonnenfeld 2000).

The illusion of top-down management

A persistent myth has it that any crisis management operation is best organized in a command and control mode. However, the first phase of a crisis will inevitably be marked by a lack of information, communication, and coordination; at that time it is impossible to control each and every move of first responders (Rodriguez *et al*. 2006). The same goes for multi-theatre, fast-moving crises and disasters like wildfires, when all too often centrally organized response systems break down, as time is lost pushing information and requests up the line and waiting for orders to come down (see further, Leonard and Howitt 2009). Effective responses in such extreme circumstances are necessarily improvised, flexible, and networked (rather than planned, standardized, and centrally led). They are driven by the initiative of operational leaders and the strength of the pre-existing ties between the teams and organizations they represent (Hilliard 2000; Lutz and Lindell 2009; Moynihan 2009, 2012).

Mismanaging media

There is no doubt that media provide crucial channels of communication to both the crisis response network and the outside world. But they do more than that. They set the stage on which the performance of crisis managers will be evaluated (Miller and Goidel 2009;

Streitmatter 1997). In addition, the internet and its social networking sites have added a whole new layer of opportunities as well as complications in organizing communication and 'meaning making' in times of crisis. Reporters will not abandon their critical faculties, or ignore the commercial pressures they are under to produce news that sells, just because the story of the day is one of disaster and tragedy. When media turn critical in the middle of a crisis, disappointment at this 'betrayal' may easily elicit among authorities an 'us-versus-them' mentality towards journalists, bloggers, and Twitterers. This then sets the stage for a shrill public conversation about the crisis, indeed a 'framing contest', which governments – as indeed corporations, witness BP during the Louisiana oil spill – beset by a siege mentality will be hard-pressed to win (Boin *et al*. 2009; Hood 2011).

Collaboration breakdowns

It is not easy to achieve full-blown collaboration and partnership in crisis management (Waugh 2006); it requires active boundary work on the part of all actors involved (Moynihan 2009). Empirical studies of crisis management networks show that all too often pivotal actors accord that work low priority, that tribal identities are strong, particularly among the uniformed services, and that the divide between full-time and volunteer crisis management workers can be persistent (Wise and McGuire 2009).

The consequences of suboptimal interorganizational and intergovernmental relations in crisis response networks are clear. One only has to think of the botched response to Hurricane Katrina. If the response network falters, even the simplest tasks, such as bringing bottles of water to the New Orleans Superdome, may become unbelievably complicated. Networks fall apart when organizations continue to run their own race, producing disjointed response operations that are confusing to citizens and other stakeholders; when time-consuming conflicts emerge over division of labour, 'incident controller' and 'lead agency' roles, and the choice of methods of operation; and when the institutional architecture of crisis response is simply too complex, involving so many actors, layers, and nodes that ambiguity, overlap, and misunderstandings are inevitable. When pre-existing relations between actors in crisis response networks are non-existent or tense, they are not going to magically improve when an emergency has occurred – on the contrary (Rosenthal *et al*. 1991).

Precarious learning

A whole new set of challenges in dealing with crisis arises after the response phase (Boin *et al*. 2009). When exhausted policymakers are ready to return to the 'normal' issues of running their organizations and governments, they often discover that most emergencies cast a long shadow. They will have to engage in the politics of crisis management. These involve scoping and implementing recovery programmes in a climate of trauma and recrimination. They will have to focus on the inevitable calls for inquiries, accountability, and liability. Challenges will revolve around the 'learning' and 'change' that is expected to occur after a crisis. These are processes in which there can be considerable gains as well as losses for many stakeholders.

Through detailed reconstruction, post-emergency inquiries often identify the causal paths along which vulnerabilities in prevention, preparedness, and response efforts could develop and escalate. Yet the path from causal reconstruction to systemic change can be rocky. The political status quo in the organizations and sectors involved can be hard to challenge. The mere occurrence of a deep crisis does not guarantee that existing path dependencies are shattered (Kuipers 2006).

Germany and Japan took drastic policy decisions after Fukushima, but this is the exception rather than the rule. Change is more often than not incremental, perhaps even peripheral when measured against the depth of the problems revealed by the crisis (Boin *et al*. 2008, 2009). The regulatory responses in the UK, USA, and the EU to the financial meltdown of 2007–09 are a case in point (Engelen *et al*. 2011). Moreover, not every major policy change undertaken in response to a crisis is rooted in what scholars would describe as policy or organizational 'learning'. Post-crisis change may also be a product of expediency, undertaken to project determination and to pre-empt what they see as politically motivated witch hunts undertaken by their adversaries.

LEARNING TO COPE WITH CRISES: AN EMERGING RESEARCH AGENDA

The complex challenges of crisis management will not go away. We have no choice but to engage with the risks of catastrophic failure in the public and corporate domain – in energy policy, in banking, in urban planning, in climate mitigation policy, in public health policy, in food regulation, in managing economic, ethnic and religious differences, and indeed any other societal domain punctuated by major upheaval.

Researchers can contribute to this in a number of ways. Here I want to focus on one pivotal domain in which they can make a real difference: by discerning the factors and dynamics at play that determine why some organizations and communities are demonstrably better in drawing helpful lessons from the experience of crisis than otherwise comparable others.

Existing research on crisis-induced institutional learning suggests that such variations are bound to reflect pre-existing contextual and systemic differences: pre-existing slack resources, power distributions, leadership skills, advocacy coalitions, collective memory, and cultural biases, to name but a few (Birkland 2006; Boin *et al*. 2008, 2009; Farmbry 2012; Goldfinch and 't Hart 2003; Douglas and Wildavsky 1982; Nohrstedt and Weible 2010; Schwarz and Thompson 1990). But they might also reflect differences in the kinds of challenges that various types of crisis raise. By way of a research agenda, let me offer three explanatory propositions about crisis-induced institutional learning that are worthy of further investigation by students of public administration.

First, *security crises generate higher levels of fear and outrage than safety crises, and thus a greater risk of policy overreaction*. In the former, the status quo is disrupted through the deliberate actions of adversaries, ranging from lone-wolf killers (Anders Breivik, mall and campus shooters, the Beltway sniper, the UNA bomber) to terrorist groups, entrenched criminal syndicates, and 'rogue' states. Security crises are episodes of serial or mass violence dramatizing the existence of an enemy 'out there' – or, even more insidious, an enemy 'within' – bent on destroying a community's values by exploiting its vulnerabilities. When particular security incidents and threats are widely understood in these terms, it becomes almost a moral imperative to 'leave no stone unturned' to reduce the danger and preferably eradicate its source. Hence security crises tend to be followed by political decisions to wage 'wars', often amounting to massive mobilization, expansion, and restructuring of intelligence, legal, law enforcement, and (para)military resources.

Such 'wars' are hard to calibrate and contain within a framework of reflective policy learning, as their fervour is driven not by partisan politics and the contest of policy convictions as usual but by the seemingly objective imperatives of 'national security' (Buzan *et al*. 1997). For many months after 9/11, expressing reservations about the 'war on terror' amounted to unpatriotic behaviour, so strong was the moral frame underpinning

that particular crisis response strategy. In security crises, politics gets stripped down to its Schmittian essence: the struggle against the enemy (Schmitt 2007).

By contrast, in the wake of safety crises, where the source of danger is nature, or human and institutional error, there is more ambiguity and disagreement about what has caused the emergency and what its policy implications should be. As a result, the politics of accountability and learning in the wake of safety crises are likely to be more prone to the kind of checks and balances that can help produce a measured and reflective response. Post-Fukushima nuclear energy policy reversals in Japan, Germany and Switzerland may be exceptional rather than typical in that regard, but this is a matter for comparative empirical research on policy and political adaptation to safety and security crises.

Secondly, *paradigm-shattering crises are more easily leveraged for major policy change than paradigm-confirming crises*. Paradigm-shattering crises are major emergencies that come as total surprises to the dominant coalition within an organization or policy sector. They occur in part precisely because policymakers and managers in charge believed that they cannot happen. Such institutional blind spots allow the improbable to happen (Turner and Pidgeon 1997; Vaughan 1997).

With the system in shock, the call for root-and-branch inquiries into the causes will be irresistible. Such inquiries more often than not leave pre-existing belief systems and the risk management coalitions built upon them wide open to highly visible and authoritative challenge and change. In contrast, crises that fit within existing risk catalogues receive less rigorous and less contentious scrutiny. They fit known patterns. They affirm what we already feared but could not fully prevent or contain. In policy terms, they stimulate learning processes that boil down to 'more of the same', serving to boost the strategies and resource claims of existing risk management coalitions.

A third proposition holds that *'blameless' crises generate fewer political casualties and more reflective forms of policy change than 'shameful' crises*. Shameful crises are those in which the forensic dynamics of ascertaining causality and inferring lessons for improvement are eclipsed by the political dynamics of establishing responsibility and assigning blame (Boin *et al*. 2008, 2009; Hood 2011). Crises become 'shameful' when the dominant opinion asserts that they were due to avoidable failures within one or more of the key organizations involved. This then sets in motion a search for culprits within those organizations, but also within the relevant regulatory institutions and the political elites holding systemic responsibility for risk management and crisis preparedness. The media, political, and legal struggles that ensue more often than not become major obstacles to policy-oriented learning.

The learning game presupposes space for 'safe' critical self-interrogation; the blame game crowds out that space. It turns each and every part of the past into a political liability. It induces defensiveness and avoidance. Helpful policy learning can only ensue when the spiral of blame management and politically motivated crisis exploitation has run its course. This may take years – if the moment arrives at all. As a typical example, the 1986 Bhopal chemical disaster produced a series of court battles in both India and the USA, spanning more than two decades during which the Union Carbide corporation fought tooth and nail any inference about the causes of the disaster that might lead to compensation claims.

Institutionally and politically 'blameless' crises, in contrast, are those where the dominant interpretation of what happened centres around exogenous, uncontrollable, unforeseeable forces. When the occurrence and escalation of crises is attributed to these forces, the post-crisis accountability process exonerates the incumbent elites and existing governance practices. The challenge in learning from blame-free crises is therefore not

to prevent paralyzing blame games but to avoid complacent resignation to the power of contingency.

To conclude, there is need for research on risk and crisis management that marries the long-standing, often technical, preoccupations of its specialist scholarly and practical communities with the broader agenda of mainstream students of public administration. Researchers can play a pivotal role in continuous independent monitoring and assessment of risk management and emergency planning networks and practices. They can help us better understand the dynamics of these networks in light of broader institutional arrangements and cultural practices, the dynamics of ongoing waves of policy and organizational reforms, and processes of benchmarking and standardization in relation to other jurisdictions at home and abroad. Audits as well as lesson-drawing exercises based on comparative analysis of experiences in other jurisdictions force risk managers and crisis response leaders to explain why the system looks the way it does, and to reflect on the strengths and weaknesses of current arrangements. They generate new insights that can make the system more effective.

None of this is rocket science. Yet many organizations routinely carry on without such periodic scrutiny and self-reflection. A main reason is that responsible risk management and sensible crisis preparedness strongly depend on active, continuous involvement and visible commitment of managerial and political-administrative elites. These elites either nurture or obstruct a culture of inquiry in which everybody is invited to consider vulnerabilities and propose better ways of organizing systems that are both reliable and resilient. Ideally, their words and deeds signal that robust risk and crisis management systems are considered crucial by those at the very top – always, not just in the wake of terrible tragedies like Fukushima.

Striving for such robust systems entails not just the 'technical' challenge of identifying and implementing an expert consensus on widely known and agreed upon 'best practices'. It constitutes a far greater leadership challenge: provoking the organization or community as a whole to engage in the adaptive work of reappraising current practices of managing reflexive modernity and the fundamental beliefs and values underpinning them (Hutter 2010). Studying the extent to which and the manner in which government and corporate elites take up that challenge is perhaps the most pivotal part of my research agenda for public administration.

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