Crisis induced learning: Swedish public sector organizations' learning after crises

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1. Introduction

The Swedish power system is highly resilient, especially in urban areas. Durable technical network failures are uncommon, and when they have occurred, it has usually been in rural areas. On March 11 2001, however, the northwestern suburbs of Stockholm were the scenes of a blackout that lasted for 37 hours. The failure occurred because the local system lacked redundancy, and when a high voltage cable in an underground cable tunnel overheated, a fire broke out that seriously damaged every cable in the tunnel, main cables as well as back-ups.

From a Swedish perspective, the blackout was unique. It seriously affected businesses and public administration as well as the daily lives of residents as some 50,000 people and 700 businesses employing upwards of 30,000 people (Birka Bildserie, 2001). Eight city districts were affected, most importantly Sweden's center for high-tech industry in the district of Kista, but also districts that were home to a culturally diverse population.

The blackout was one of the most comprehensive power outages ever to strike Sweden and one of largest power disturbances ever witnessed in the history of electricity distribution in the Swedish capital (Karlsson, 2001). Both the duration of the blackout and its scope were without modern precedent (Aktuellt, 2001). The particulars of this situation, then, placed a number of specific demands on crisis managers. The blackout challenged the crisis management capacity of the power company Birka Energi and the City's command and control. The fact that the city's contingency plan had recently been updated also challenged the city's management and coordination efforts, which were carried out by the City Hall along with the fire brigade. Apart from the emergency planning process during the run up to the new millennium (Y2K), the power company and the city pretty much lacked crisis management experiences.

In the aftermath of the blackout a thorough multi-agency evaluation of the event and its management was conducted. In addition lessons on several levels were pledged. Then in May 2002 history repeated itself. Once again, a high voltage power cable overheated in the exact same tunnel. A fire then broke out that caused serious damage

to all cables in the tunnel. And once again the lights went out in the districts. The blackout in May 2002 lasted for 52 hours.

These two blackouts in the northwestern suburbs of Stockholm in 2001 and 2002 (referred to as Kista 2001 and Kista 2002) represent a highly unusual case. It entails two very similar crises that posed challenges to the same organizations, operated to a large extent by the same individuals, within a limited space of time. The case offers a unique opportunity to study to what extent and how public sector organizations learn from crisis episodes.[1]

The main actors involved in the management of these contingencies are the Stockholm city's command and control, consisting of the City Hall and the fire brigade, which represent a fully public organization and Birka Energi (later renamed Fortum), which represent an organization that is more of a hybrid organization.[2] Comparing the crisis-induced learning capacities of these two organizations will give us insights into the learning patterns of different types of organizations.

The decision to study if and how organizations learn, poses several questions that need to be addressed. How might organizational learning be defined? How can the organizational learning concept be disaggregated? How might it be measured? What are the effects of timing on organizational learning? How can the concept of organizational learning be operationalized? And, to begin with, for what reasons should we expect that crises are stimulants to learning in the first place? This paper will delve more deeply into these questions and suggest an empirical application of the organizational learning concept.

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[1] The concept of crisis is understood as a phenomenon and social construction characterized by three components that challenge decision-making and communication. A crisis occurs when central actors perceive the situation as threatening to core values, while limited time is at hand, and circumstances are characterized by uncertainty. Thus, the essence of the conception of crisis in this definition lies in the perception of its managers (Sundelius et al, 1997:13).

[2] The City of Stockholm owned 50 percent of Birka at the time of the first blackout. By the time of the second blackout, Birka had recently been sold to the state owned Finnish firm Fortum.

2. Why study crisis induced learning?

The idea of crisis-induced learning is rooted in conventional wisdom. For what reasons, though, should we expect that crises might in fact be good stimulants to learning? After all, planning processes are often characterized by wishful thinking. Rosy scenarios are many times prioritized instead of worst-case deliberations. After crises people tend to leave the difficult task of crisis management evaluation behind and move on. Psychological obstacles such as opportunism and denial tend to thwart lesson drawing (Stern, 1997: 78). In a post-crisis context characterized by high politics, differing interpretation may arise among actors regarding what needs and can be done and how ('t Hart & Boin, 2005). Evaluations tend to cover up flaws and refrain from airing criticism against specific members of staff. Blame games and scape-goating might also move the focus from implementing lessons learned. New issues at hand, and not least the financial situation, might distract attention from much needed evaluations altogether. Hence, learning tends to stop at correcting minor errors by routine, while the fundamental principals, values, norms and operating procedures behind the crisis are not inquired into (c.f. Argyris & Schön, 1978: 29ff; Argyris & Schön, 1996). In sum, crisis experiences are often wasted.

This is of course very unfortunate. It is considered to be natural to learn lessons from major failures or disasters in order to prevent a repeat of the crisis (Knopf, 2002; Schwartz & Sulitzeanu-Kenan, 2004). Several scholarly streams also present support for the idea of crisis induced learning. The policy agenda and policy change literatures identify crises as trigger events (Cobb & Elder 1983), external perturbations (Sabatier, 1993) and focusing events (Birkland, 1997) with potential for comprehensive policy change. In addition windows of opportunity for policy change are opened in the crisis aftermath (Kingdon, 1995; Schwartz & Sulitzeanu-Kenan, 2004). Scholars in the field of organizational learning also promote the effect that crises and disasters have on learning and change. Fiol and Lyles for instance write that "[c]onsiderable evidence" indicate that some kind of crisis is necessary for more refined "higher-level" learning to occur (Fiol & Lyles 1985: 808). Seeger et al are also promoters of the idea of crisis induced learning. They write that "[p]ostcrisis contexts are characterized by analysis of what went wrong, why, and what can be done to ensure that similar events do not occur again" (Seeger, Sellnow & Ulmer, 2003: 37). Scholars probing learning in the private sector emphasize this view in particular. A common view among these authors

is that success tends to be a hindrance to learning, while failures and crises stimulate learning as they stress the need to question existing procedures and beliefs (Bertoin Antal, Dierkes and Krebsbach-Gnath, 2004: 37). Many scholars argue that learning possibly follows crisis in the corporate sector, since companies are compelled to learn from mistakes and crises to avoid mortification. As for instance Seeger et al put it: "organizations that are unwilling to change are *forced* to do so in the aftermath of a crisis" [emphasis added] (Seeger et al, 2003: 259,). The authors stress that crises serve as a clear indication that organizational change is needed. Seeger et al see learning as a natural phase in the crisis chronology: "crises have an intrinsic capacity for inducing learning and innovation" (ibid: 257). In the worst case, if the organization is incapable of responding effectively to crisis, the organizations might not survive the crisis (ibid: 260). Nonetheless, Seeger et al's view on crisis induced learning is both simplistic and naïve. They do not take into account the complexity of crisis or the complexity of learning and the, often political, processes that come into play following crises. Even though ministers and even governments may fall and individual careers may be terminated in the crisis aftermath, it seems far-fetched that public organizations in general run the risk of mortification. Although other authors argue that governments also can be forced to learn (e.g. Commons, 2004: 37), loss of power or general election setbacks are hardly comparable to total mortification.[3] This naive view, then, cannot be adopted when we focus on public entities. At least in the European context, the gap between private and public is still an important part of reality, although it is continuously decreasing.

Drawing and making use of lessons from crisis experiences is vital for creating robust, safe, and reliable organizations and societies as well as for decreasing the risks of future crises (Argyris & Schön, 1978: 5). In line with this argument, it is a truly important task to increase knowledge about why some individuals and organizations learn from crisis experiences and others do not and what explains different learning patterns in response to a crisis.

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[3] In democracies termination or mortification of public agencies is not a result of the whims of politicians. On the contrary, politicians terminate agencies only after learning about them (Carpenter & Lewis, 2004: 201). Termination of agencies then is rare, but when it does occur it has three primary causes: agency failure, political opposition or competition among agencies for scarce resources (Bardach, 1976; de Leon, 1987; Lewis, 2002; Carpenter & Lewis, 2004).

3. Defining organizational learning

The concept of learning has been characterized as a "conceptual minefield" (Levy, 1994) and a "hot-bed of dissensus" (Stern, 1997: 69). Researchers that deal with the concept of learning, and especially organizational learning, are challenged on normative, methodological, and ontological grounds (Dekker & Hansén, 2004: 212). One reason behind the diverging opinions is the number of different scholarly disciplines that has taken an interest in the topic (Dodgson, 1993: 375; Easterby-Smith, 1997: 1085). The sheer number of scholarly disciplines involved in discussing the topic leads to difficulties in reaching consensus regarding for definitions and methods.

Learning is most easily noticed and analyzed when it is seen as an effect, product or outcome. Learning can also be understood as a process that results in such an outcome. The question whether or not learning *per se* should be interpreted as synonymous to an improved outcome, leads us to the normative dispute on the topic. The normative and prescriptive literature on learning, which mostly is referred to as the 'learning organization' literature, relates learning to improvement and competitiveness (Dodgson, 1993: 376; Huysman: 2000). Learning in this perspective is seen as "to have occurred when organizations perform in changed and better ways" (Dodgson, 1993: 378). These studies have been criticized for avoiding rigorous methodological discussions and for presenting theories based on the author's own consultancy experiences that, in turn, are overgeneralized to all types of organizations (Tsang, 1997: 39). The literature on the learning organization is mostly grounded within management or consultancy and it is often regarded as being superficial regarding arguments and conceptualizations of learning and change (Lind & Hellström, 1996). For most times then this literature lacks a solid theoretical and empirical foundation (Huysman, 2000: 133).[4]

The organizational learning stream, on the other hand, does not pay attention to the outcome, instead these authors focus on the process. Argyris and Schön describe this field of literature as "intentionally distant from practice, nonprescriptive, and value-

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[4] Of course there are exceptions. See for instance Fiol & Lyles (1985) and March (1991).

neutral" (1996: 188). A downside to these studies is that they can be "too conceptual" and that insights are "scattered and unordered" (Huysman, 2000: 134). Since they look at organizations that learn for good or for bad, they seldom manage to generate useful advice for practitioners (Tsang, 1997: 39.). Levy is an example of a researcher who prioritizes analytical rigor. He proposes a non-normative definition of learning.[5] Although absence of an accuracy or effectiveness criterion in the definition may entail that 'pathological' learning is part of the concept, Levy argues that it is more important to assure that the research is not tainted by the analyst's potential subjective biases (Levy, 1994: 290-291).

In the words of Schön (1975: 6): "It is paradoxical to say that there has been learning, but nothing has been learned." But this is not an argument for the normative approach. As long as learning has taken place, lessons will have been learned, whether they are good or bad for the organization is a different issue. Moreover, actual empirical evidence indicates that a non-normative approach to learning is the most favorable for the analyst to embark on.[6]

For the learning process to result in a learning outcome, change has to be an integral part of the definition. Some reject distinguishing between learning and policy change. These authors argue that learning that does not affect behavior is not useful for the sake of developing new theory or that an intervening variable between agency and change may never be successfully operationalized (Jarosz & Nye, 1993: 130; Bennet & Howlett, 1992: 290). A contrary view is held by Levy, who states that: "If we study only learning that is followed by policy change, we cannot understand when individual learning gets translated into policy and when learning gets blocked by

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[5] Levy defines learning "as a change of beliefs (or the degree of confidence in one's beliefs) or the development of new beliefs, skills, or procedures as a result of the observation and interpretation of experience" (Levy, 1994: 283).

[6] In fact, experiences from NASA tell us that disasters can occur as a result of lessons learned. In 1960 a test pilot came close to Asphyxiation in a vacuum chamber. The lesson that was learned from this incident was to give the astronauts pure oxygen to breathe (Chiles, 2001). In 1967 during a simulation at Cape Canaveral, three astronauts died in a blaze in the Apollo capsule. Due to the lessons drawn seven years earlier, the capsule that the astronauts were sitting in was filled with pure oxygen. It only took a small spark to turn the capsule into a fireball (Murray & Cox, 1989). The near miss led to learning that in turn led to disaster.

institutional or political constraints" (Levy, 1994: 292). This sounds reasonable. But it is only a problem if we study learning as an outcome. If we study learning as a process, which this paper aims to do, learning that leads to actual change as well as lessons that are blocked on the way will be taken into account. Hence, behavior and change must be part of the definition of learning.

Learning has traditionally been understood as an activity engaged in by individual people. In the 1960s and 1970s, however, a new school of thought emerged, stressing the notion of organizational learning (Cyert & March, 1963; March & Olsen, 1976; Argyris & Schön, 1978; 1996). These scholars claimed that learning could occur collectively. In organizational learning, lesson drawing and knowledge dissemination is rooted in the organizational level. Hence, organizational learning is more than the sum total of the individual learning within the organization. Still, in many studies organizational learning and behavior is reduced to individual behavior (Huysman, 2000; Lähteenmäki, Toivonen & Mattila, 2001; Weick & Ashford, 2001; May, 1992). The reason for being that organizational learning cannot be pursued without the intervention of individual action (Schön, 1975: 6). The relation between individual and organizational learning is not clear-cut. Nevertheless, it is vital that analysts are unambiguous when they argue about what units in fact learn.

So, who are the learning agents? Who actually learns? Is it the individuals or small groups within the organization or is it the organization collectively? Or maybe it is some more abstract inter-organizational crisis management system? The relation between individual and organizational learning is debated from both empirical and theoretical perspectives. Generally, organizational learning is understood as being based on individual learning that is shared with other (or in some cases all) members of the organization, by for instance standard operating procedures, cultural norms, and organizational policies, stories and ceremonies (Argyris & Schön, 1978; Lawson & Ventriss, 1992). Organizations then learn through individuals who act as agents for them by encoding individually learned inferences from experience into organizational routines (Argyris, 1978; Levy, 1994). The individual acts and learns with the organization as an arena or framework (March & Olsen, 1976; Hedberg, 1981; Dodgson, 1993; Nicolini & Meznar, 1995). This makes the individual members of the organization the primary learning entities and the principal agents of organizational

behavior (Argyris & Schön, 1978; Dodgson, 1993).[7] The individual-centered perspective is criticized by a number of researchers (Duncan & Weiss, 1979; Cyert & March, 1963; Levitt & March, 1998; Lant & Mezias, 1990) who claim that merely individual learning does not explain how shared knowledge can be developed in an organization as a whole or in parts of it. These scholars object to individual-centered studies of organizational learning. They assert that the organization and its structure should be regarded as an agent in its own right in the learning process.

Many researchers *do* have difficulties in differentiating between individual and organizational learning. Even Argyris and Schön, nestors of organizational learning theory, are subjected to critique in this respect (Huysman, 2000: 135). Argyris and Schön, however, are aware that what they call organizational learning is in fact a product of the learning of individuals (Argyris & Schön, 1996: 192). They define organizational learning as a process, carried out by the members of an organization, working in isolation or in interaction with other people within a community of organizational inquiry.[8] Inquiry, in turn, becomes organizational when individuals inquire, reflect and investigate on behalf of the organization, within a community that is governed by the organization's tasks and rules (Argyris & Schön, 1996). The learning that results from organizational inquiry will be organizational if it becomes "embedded in the images of organization held in its members' minds and/or in the epistemological artifacts (the maps, memories, and programs) embedded in the organizational environment" (Argyris & Schön, 1996: 16). This still sounds rather abstract and thin. According to the statement, learning embedded in the minds of a number of members might be enough to talk about organizational learning. Likewise, it may be sufficient to establish lessons learned in organizational artifacts. Even if lessons are part of these artifacts, they will not do much help for the organizational

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[7] Scholars who emphasize the individuals' role in organizational learning often end up with a minimalist definition of organizational learning. Jervis, who studied the learning of key players in governmental foreign policy, argues that "when an event affects the perceptual predispositions of many members of an organization we can speak of organizational learning." (Jervis, 1976: 238).

[8] Argyris and Schön do not use the concept of inquiry in the traditional sense of a more or less formal investigation. Instead they mean "the intertwining of thought and action that proceeds from doubt to the resolution of doubt" (Argyris & Schön, 1996: 11). The concept of organizational inquiry then is understood as synonymous to the learning process (ibid: 191).

knowledge if they are not shared among the staff members. Another reasonable question is how many members' minds and memories we are referring to when we talk about organizational inquiry and organizational learning. And, when do we know if this knowledge is more or less permanent or if it just information passing by?

One, albeit rather abstract, way to solve some of these problems is to stress that organizations learn as lessons are shared throughout the organization and stored in its *organizational memory* (Dekker & Hansén, 2004: 217).[9] Then organizational learning is set apart from individual learning by the process of institutionalizing knowledge. Lessons become institutionalized within the bureaucratic structures of the organization (Dekker & Hansén, 2004: 219).[10] On that note, it is important for an organization that aims to learn to cultivate their institutional memory (Stern, 1997: 70). The concept of collective, institutional or organizational memory, then, is another key concept for understanding organizational learning and change. The concept of collective memory has been critiqued for being commonsensical and lacking "solid empirical footing" (Glynn, 1997: 147; Casey, 1997). Nevertheless, Argyris and Schön define collective maps or collective memory as patterns of understanding that a number of people and teams develop jointly and that reflect the organization's understanding of reality and its environment (Argyris & Schön, 1996). Collective memory can take on either more or less explicit forms like artifacts such as formal rules, policy documents and manuals or more invisible and implicit forms, such as organizational routines, norms, beliefs and working procedures. Collective memory is often scattered and hard to locate by agents of organizational learning. Bringing this information into a unified picture that is organized in an effort to learn and act is a key to organizational learning (Argyris & Schön, 1978: 160).

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[9] The concept of organizational memory may seem vague and elusive but it can be strengthened by tangible efforts like learning histories that tell the story of the organizations to the organization (Roth & Kleiner, 1998).

[10] Bureaucratic or organizational structures may entail channels of communication (forums for discussion and debate, formal and informal patterns of interaction); information systems, including their media and technologies (e.g. the computer); the spatial environment of the organization insofar as it influences patterns of communication; procedures and routines that guide individual and interactive inquiry; and systems of incentives that influence the will to inquire (Argyris & Schön, 1996: 28).

4. Disaggregating the organizational learning concept

The scholarly literature asserts that there is a considerable lack of empirical studies in the field of organizational learning (Dekker & Hansén, 2004; Easterby-Smith & Araujo 1999; Fiol & Lyles, 1985; Huber, 1991; Miner & Mezias, 1996; Lähteenmaki et al, 2001). The reasons for this is that the concept of learning is hard to define, isolate, measure and apply empirically (Levy, 1994: 280). Moreover, conceptual confusion still surrounds the concept (Berends, Boersma & Weggeman, 2003). No clear definition has won acceptance in the various scholarly camps (Dekker & Hansén, 2004: 216; Fiol & Lyles, 1985) and many definitions are merely tautological.[11] Notwithstanding the difficulties linked to the concept, several scholars declare that organizational learning is a useful way to study the relation between information and knowledge, on the one hand, and organizational action and change, on the other (e.g. Dekker & Hansén, 2004: 216). The various schools of thought on learning then agree that learning entails both cognition (change in states of knowledge) and behavior (change in organizational outcome) (Fiol & Lyles, 1985: 803; Argyris & Schön, 1974; Carley & Harrald, 1997). But it becomes problematic when these two factors are to be analyzed, not least since they are closely related in practical outcomes. As proposed by Argyris (in Fulmer & Keyes, 1998: 22) "it's not possible to act without using your mind/brain." But, cognition and behavior are two different things and should therefore be separated, at least in the theoretical quest of understanding organizational learning. Furthermore, in most cases, cognition and behavior do not occur at the same time and "one is not necessarily an accurate reflection of the other" (Fiol & Lyles, 1985: 806). Thus it is essential to distinguish between the two.

A simplified version of the learning process consists of two parts: the cognitive process of investigating, collecting, processing, and reflecting upon information and the behavioral process of lesson drawing, acting on the information and implementing change. The outcome of the first part of the process can be understood as lessons observed, while the outcome of the second part can be characterized as lessons implemented. The Dutch sociologist Van Duin offers a slightly more advanced

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[11] Popper and Lipshitz (2000: 181), for instance, define learning organizations as "organizations that embed institutionalized learning mechanisms within a learning culture."

dissection of the learning concept in his study of three Dutch disasters in the 1960s and 70s by adding knowledge dissemination as a third component. The dissemination of knowledge constructs a bridge between individual and organizational learning (Van Duin, 1992). Although it is essentially a behavioral aspect of learning (Dekker & Hansén, 2004), it is fruitful to include it as one part of a threefold conceptualization. The organizational learning process then, entails at least three parts: reflection/investigation, lesson drawing, and lesson dissemination/implementation. Although for theoretical reasons one might claim that investigation and reflection are cognitive processes and lesson dissemination and implementation are behavioral processes, each of these three parts entails both cognitive and behavioral aspects. In addition, they are all objects of study. But taken together, they can give us a picture of the extent or form in which organizations learn.

5. Measuring organizational learning

Although Argyris and Schön's concepts and theoretical categories are widely acclaimed and cited, their impact on the literature on organizational learning has allegedly been rather superficial (Lipshitz, 2000).[12] This is unfortunate since they have a lot to offer the study of organizational learning. Their disaggregation of the concept has both theoretical and practical advantages, although practitioners may be skeptical to their findings, as they focus on "attractive, but hard-to-realize aspects of organizational learning" (ibid: 456). This study will make use of the framework on organizational learning presented by Argyris and Schön (1978; 1996). Organizational learning, according to Argyris and Schön, involves a paradox: "organizational learning is not merely individual learning, yet organizations learn only through the experience and actions of individuals" (Argyris & Schön, 1978: 9). It is hardly surprising then that Argyris and Schön have been criticized for underestimating the institutional level (Huysman, 2000). While they see organizations as agents they foremost stress their role as arenas and "places where individuals learn and accumulate knowledge" (Lipshitz, 2000: 460). Argyris and Schön are also critiqued

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[12] Lipshitz emphasizes that, while Argyris and Schön are very much appreciated, there are four reasons why they only have a limited impact on the field of organizational learning: the relevance of their work to fundamental problems affecting organizational effectiveness and the quality of working life, the attractiveness of the terminology, the focus on interpersonal theory of action and double-loop learning, and the difficulty of mastering double-loop learning and Model II theories in use (Lipshitz, 2000: 469).

for missing the dynamics that come to the fore when groups and coalitions do not see eye to eye.[13] Nevertheless, in Argyris and Schön's view individuals are the key agents for organizational action and organizational learning (Argyris and Schön, 1978: 19).

Arguably, the most influential categorization of learning is Argyris and Schön's distinction between single-loop and double-loop learning.[14] *Single-loop learning* is achieved by mainly detecting and correcting shortcomings, divergences, and flaws without inquiring into the basic premises of the work and the organization. In these cases, learning is characterized by routinized change, while the fundamental organizational norms, principles and values remain the same (Argyris & Schön, 1978; 1996). More specifically, single-loop learning occurs when

> "members of the organization respond to changes in the internal and external environments of the organization by detecting errors which they then correct so as to maintain the central features of organizational theory-in-use." (Argyris & Schön, 1978: 18).

Single-loop learning episodes aim to preserve consistency. The feed-back loop connects detected outcomes of action to organizational strategies and assumptions that are modified in order to keep organizational performance within the range set by organizational norms, while the actual norms stay unchanged (Argyris & Schön, 1978: 19). The single-loop learning process permits the organization to carry on its present policies or achieve its present objectives. Such less refined learning

> is sufficient where error correction can proceed by changing organizational strategies and assumptions within a constant framework

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[13] Conflicting forces as learning agents is not necessarily detrimental to organizational learning according to the literature. Weick and Ashford (2001: 727), for instance, argue that organizational learning appears to be enhanced in settings where conflicts are tolerated.

[14] Argyris and Schöns' concepts draw on theoretical approaches by anthropologist Gregory Bateson (Argyris & Schön, 1978) and psychiatrist W. Ross Ashby (Argyris & Schön, 1996). For further discussions on other concepts with similar meanings presented by various scholars, see Fiol and Lyles (1985).

of norms for performance. […] In some cases, however, error correction requires an organizational learning cycle in which organizational norms themselves are modified." (ibid: 20-21).

So, when it becomes clear that it is not possible to correct the error by doing better what the organization and its managers already know how to do, single-loop learning is not enough. Then managers must undertake an inquiry that resolves the conflicting requirements. The results of their inquiry will take the form of restructuring of organizational norms, possibly a restructuring of strategies and assumptions associated with those norms, which must then be embedded in the images and maps which encode organizational theory-in-use (ibid: 22). This kind of learning is dubbed *double-loop learning*. For double-loop learning to occur, actors have to detect and correct errors by inquiring into and, if it is found necessary, modifying the underlying norms, policies and objectives of the organization (Argyris & Schön, 1978: 3; 1996). A more simplistic explanation would be: while single-loop learning means getting better at what we already know how to do, double-loop learning is basically asking if we are doing the right thing (Fulmer & Keyes, 1998: 26).

One interesting aspect that should be considered is the interaction between the two learning types. Single- and double-loop learning are not contrary to each other or mutually exclusive (Argyris & Schön, 1978: 26). But there are paradoxical elements here. Double-loop efforts may cause actors to overlook or forego very useful single-loop lessons (see e.g. Van Duin, 1992; Argyris & Schön, 1996: 281). Likewise, putting a great deal of attention on single-loop lessons may cause people to miss out on valuable double-loop learning. Single-loop learning does not necessarily lead to double-loop learning. But for an organization to double-loop learn, it will most likely already have made single-loop investigations.[15]

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[15] Argyris and Schön also present a third learning category, which they refer to as deutero-learning. In order to deutero-learn, organizations need to learn how to restructure themselves at regular intervals. That is, they have to learn how to learn, i.e. how to carry out single- and double-loop learning (Argyris & Schön, 1978: 86).[15] Deutero-learning includes inquiring into previous contexts for learning by reflecting on and inquiring into previous organizational learning experiences or failures to learn and on that basis, inventing new strategies for learning. When engaging in deutero-learning, organizations

6. The effect of timing on organizational learning

There are several important questions pertaining to crisis induced learning and the issue of timing: When should we expect learning to take place? How long time can pass between the crisis event and lesson implementation if the learning is assumed to be crisis induced? Nevertheless, analysts of organizational learning tend to overlook the issue of timing and how it affects learning. True, analysts and practitioners alike acknowledge that the more time that passes by between a crisis and lesson implementation, the less likely that actual learning will take place (c.f. Lindow, 1998). Of course, distinguishing between different types of learning entails that the timing issue is at least implicitly considered. Argyris and Schön's (1978; 1996) distinction between single- and double-loop learning is one example of a conceptualization of learning that does not disregard the issue of timing. The single-loop learning concept is all about quick fixes, while double-loop learning concerns more long-term lesson drawing.[16]

The issue of what effect time and timing has on learning is not well developed in the organizational learning literature. For this matter it is more rewarding to turn to the literature on agenda-setting (Birkland, 1997; 2004). Using Kingdon's (1995) terminology, Birkland stresses that the window of opportunity after a "large, attention-grabbing event" is rather short (Birkland, 2004: 342. See also Carley & Harrald, 1997: 312). There are two reasons for this. Firstly, the initial enthusiasm for the issue among the media and, hence, among the public and the policy makers, is likely to be short lived even after large-scale crises. Secondly, the 'easy' solutions are often engaged and adopted first in order to do 'something' after a crisis or disaster. Ideas engaged later are often more controversial and advocates may find themselves in a policy environment in which urgency has faded and where opponents argue that new solutions have been explored and need time to work (Birkland, 2004.).

"evolve new ways of seeing that enhance their capability for learning across a range of situations. Deutero-learning is organizational when it is embedded in maps and images which guide organizational decisions, control, and instruction" (ibid: 86).

[16] Deutero learning, in turn, is also the product of processes that evolve over time.

Disasters create learning opportunities because they create an openness to change. According to the agenda setting theory, timing is but one factor that explains why learning and reform occur after disasters. This stream of the literature claims that for crisis induced policy change to occur, "three criteria would have to be met: perceptions of a problem in need of solution, perceptions that increased legal and hierarchic accountability is a feasible solution, and a political climate conducive to policy change" (Schwartz & Sulitzeanu-Kenan, 2004: 97). In a prior study, Birkland has derived two conditions for disasters to reach the governmental agenda: (1) a sufficient level of dread and (2) the existence of an advocacy coalition "that connects the event as evidence of the problem with potential solutions that are feasible in the existing political climate" (Birkland, 1997: 15).

So, is it fruitful to propose that error investigation, lesson drawing and implementation should take three months, 9 months or 18? Naturally this is a difficult question to answer. Many authors observe that organizational learning only occurs when "fairly *enduring* changes in organizational structures and standard operating procedures" are created [italics added] (Common, 2004: 38; c.f. Kaufmann & Kaufmann, 1998; Weiss, 1990; Olsen & Peters, 1996). If lessons are verified as being rooted in memories despite the fact that a long time has passed between the crisis, lesson implementation and the learning evaluation, it seems possible to argue in favor of that more or less certified learning has taken place.

These three phases also mean that there are at least three points in the learning process that might fail and thus lead to either a halted or flawed learning curve. Organizations might fail in event/incident investigation, lesson drawing and/or lesson implementation and dissemination.

Other scholars have presented similar disaggregations of the concept of organizational learning. Carley and Harrald (1997: 324), for instance, argue that organizational learning occurs in stages and that it involves three steps: problem recognition, problem solving, and implementation of solutions. In their early works, Argyris and Schön disaggregated the learning process into four parts: 1) discovering the problem; 2) inventing a solution, 3) producing the invention, 4) generalizing what has been learned to other settings (Argyris & Schön, 1974; Carrol, 1995). Although these four

phases of organizational learning might not be apt for the aim of this paper, characterizing organizational learning as knowledge investigation, action, and dissemination is insufficient. A fourth stage needs to be added. Monitoring the lessons is a vital part of the learning process (Korneef, 2000: 65). Monitoring the lessons will in time turn lessons observed and implemented into lessons learned. Only then will learning come full circle and be enduring.[17]

7. Conclusion: Toward an operationalization of the organizational learning concept

In the crisis aftermath some questions tend to get more attention than others. What can we do to prevent a repeat of the crisis? And, if we in the future are subjected to a similar contingency, what can we do to ensure a more effective and legitimate response? To answer these questions it is vital to learn more about organizational learning processes after crises, what triggers them and, not least, what hinders them. Only then will we be able to create truly robust, safe, and reliable organizations and societies.

This paper has presented a number of issues pertaining to the difficulties of applying the concept of organizational learning empirically. The discussion has put forth a suggestion of a definition that follows the works of Argyris and Schön. Organizational learning is understood as a process carried out by the members of an organization, working within a community of organizational inquiry. For organizational learning to come full circle, lessons must become incorporated into the bureaucratic structures, i.e. embedded into the formal rules, operational procedures, and information systems of the organization.

It is also essential to distinguish between different levels of learning. Some lessons come easy while others require thorough inquiry and analytical vigor. Here too, Argyris and Schöns' categorization comes in handy. The routinized change, or single-loop learning, is set apart from the policy questioning double loop learning. While the

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[17] It can be argued, however, that if we look at learning as a cycle, there is really no greater difference between monitoring the effectiveness of proposed measures after their implementation and renewed knowledge investigation.

former represents detecting and correcting minor flaws that in the crisis aftermath are a matter of course, the latter is achieved by questioning basic methods, objectives and norms of the work and organization. The single-loop lesson inquiries are often engaged first in order to do something after a crisis, which might affect the window of opportunity for double loop learning.

Whatever the level, single or double loop, the organizational learning process consists of four phases: 1) gathering knowledge, 2) acting on that knowledge, 3) spreading that knowledge throughout the organization, and 4) making sure that the knowledge remains in the organization.[18] In order to achieve organizational learning, the organization has to develop learning systems that are shared by the members of the organization. The learning systems should also be established within the structure of the organization and become a part of the organizational memory. The learning systems are somewhat more tangible than the very abstract processes of organizational learning. But by mapping out the learning systems, it will be possible to also grasp processes of organizational learning. Below some vital components for creating learning systems, and thus for developing crisis induced organizational learning are listed. The list is a first step toward establishing criteria for analyzing the empirical case of crisis induced learning after the blackouts in Stockholm in 2001 and 2002.

1. Systems for organizational investigation (gathering knowledge)
How can the following processes and systems be characterized?
- Contingency planning
- Crisis management training
- Incident reporting
- Post crisis investigation and/or evaluation
- Post crisis staff debriefs.

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[18] A similar fourfold operationalization is presented by Dekker & Hansén (2004), who talk of information production, lesson-drawing, knowledge dissemination and institutionalization of knowledge.

2. Systems for organizational lesson drawing (acting on the knowledge)

How can the following processes and systems be characterized?

- Follow through lessons suggested in reports, evaluations, debriefs, etc.

- Quality control and revision of decisions and choices of actions

3. Systems for organizational knowledge dissemination (spreading the knowledge)

How can the following processes and systems be characterized?

- Staff access to (and absorption of) reports, evaluations, debriefs, etc.

- Forums for discussing and sharing the lessons of the reports, debriefs, etc.

4. Systems for organizational memory (ensuring the knowledge)

How can the following processes and systems be characterized?

- "Debriefing" of key staff members that leave the organization.

- Documentation (notes, logs, paper trails, staff magazines)?

- Archives (traditional or electronic) frequented by the staff.

* * *

This 'checklist' is in effect an attempt to operationalize the learning concept. Put more succinctly, these factors will be used as criteria on empirical case data from the blackouts in northwestern Stockholm in 2001 and 2002. Inquiring into whether or not these factors were accomplished by the decision making processes performed by the organizations that were essential in managing the crises will give us insights into the learning patterns of different types of public organizations after crises.

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