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Being at-risk or taking risks? Electricity blackouts through sociological theories
Abstract (310 words)

This paper, which is a draft for my PhD dissertation, will look at the subject of electricity supply failures, or blackouts, through sociological and organizational theories of *risk*. Risk is the possibility that something unexpected, unlikely or unpleasant will happen (Luhmann 1993). My presupposition is that infrastructure risks – that is, the possibility that something unexpected, unlikely or unpleasant will happen to the infrastructure technologies – has been constituted a pressing contemporary problem, as exemplified by the powerful new security concepts "critical infrastructure protection" and "vital systems security" (Collier & Lakoff 2008; Collier 2006; Dunn forthcoming). However, different disciplines hardly agree what to make of the term of risk, which motivates my literature review of risk in the context of infrastructure failures.

My starting point is that it is not analytically productive to separate a "physical" side of infrastructure risks from some "socially constructed" element like trust (Giddens 1991), group relations (Douglas & Wildavsky 1982; Adams 1995) or cultural narratives (Alexander & Smith 1996). Instead, I claim the risky infrastructure technologies themselves and their production by experts should be scrutinized along with the risks' practical effects and consequences. Keeping this in mind, I shall review three influential theories of risk. First, Ulrich Beck (e.g. 1992; 1995; 2006) links his "risk society" and "reflexive modernization" to expertise, globalization and individuation in the industrial society. Second, Frank Furedi (e.g. 2006; 2007a; 2007b) connects a "culture of fear" with a moral climate that sees people as vulnerable. Although Beck and Furedi have diagnostic strengths, in the third section of my paper I will move unto less general, organizational and science and technology studies approaches on infrastructure risks (Schulman & Roe 2007; Schulman et al 2004; Vaughn 1996; Silvast 2006). I claim that in studying infrastructure risks, it is analytically productive to frame risks as concrete problems which deal with practical matters of uncertainty.

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Abstract

This paper, which is a draft of a chapter for my PhD dissertation, will look at the subject of infrastructure failures through social theories of risk. Risk is the possibility that something unexpected, unlikely and unpleasant will happen. My assumption is that infrastructure risks – that is, the possibility that something unexpected, unlikely or unpleasant will happen to the infrastructure technologies – is a pressing contemporary problem. This is exemplified by the powerful new security concepts "critical infrastructure protection" and "vital systems security" as well as the public anxieties of infrastructures being used as a terrorist weapon and the world-wide concern over the Y2K bug in 1999.

Hence, a serious dependency on functioning infrastructures has been realized and the experts seem to agree that people have not been prepared enough for infrastructure failures. However, the present discussion of infrastructure risks has in almost every respect been lacking more analytical attempts to explain and understand the phenomenon, which motivates this literature review of risk. More specifically I shall employ three distinct theories to understand the production of infrastructure risks. First, Ulrich Beck writes about "risk society" and "reflexive modernization", which he links to the transformations of the whole industrial society, especially in the spheres of expertise, globalization and individuation. Second, Frank Furedi makes

a diagnosis about a present "culture of fear", which is a pervasive moral climate that renders both technologies and people as vulnerable. In the third section of my paper I will move unto less general and more empirical approaches on infrastructure risks. My strategy is to focus on the theories' ontological selections, use of concepts and the perception of social and historical transformations.

Introduction

My sociology PhD dissertation deals with the changing expertise on the security of infrastructure technologies like energy, water, heat, traffic and telecommunications. The possibility that infrastructure networks fail is a pressing contemporary problem. However, there have been little in terms of social theoretical attempts to understand and explain the phenomenon. In this paper, I address the problem of infrastructure failures with one much-discussed social theoretical concept: *risk.*

Risk at the most general level can be defined as the possibility that something unexpected, unlikely and unpleasant will happen (Eräsaari 1997). My objective in this paper is to review different theories of risk and employ them in the case of infrastructure failures, with a specific focus on the expertise that governs electricity supply failures (*blackouts*). The theories will be exemplified with Finnish policies that deal with electricity infrastructure failures.

As Randall Collins (1998, 1) puts it, intellectual life is first of all about conflict and disagreement. Then it is no surprise that there are also various warring theoretical camps also on the question of risk, and it is indeed productive to scrutinize in more detail into the philosophy of science distinctions between them. My focus shall be on the theories' following aspects, whose selection has been inspired from Ian Hacking's (1990, Lehtonen 2003) research apparatus of *style of reasoning*:

1. CONCEPTS. How does the theory understand the concept of risk, and what are the other interrelated concepts that are used with it?

2. ONTOLOGY. How are the relationships and properties of societies, communities and individuals constituted whilst using the concept of risk and which aspects of reality are left out of the theory?

3. TRANSFORMATIONS. What are the novel social and historical transformations that the theories lay claim to whilst employing the afforementioned choices?

Using this approach, I will review three distinct theories:

1. In Ulrich Beck's theory of the *risk society*, catastrophic "modernisation risks" are seen as rendering the industrial society and its institutions helpless, whence a reflective politics of mitigation needs to be introduced.

2. In Frank Furedi's theory of the *culture of fear*, there is a pervasive Western cultural mood that exaggerates problems facing society, and an enlightened humanistic project of politics needs to be introduced.

3. Organizational theories of *accidents and risks* focus on the actions and routines of organisations and on the organizational and interorganizational structures which facilitate risks.

It should be noted that these are not the only social theories about risk. Most notably this chapter will *not* handle in any great depth the psycho-anthropological studies of a cultural "risk selection" (e.g. Douglas & Wildavsky 1982; Douglas 1985; Adams 1995) or Anthony Giddens's (1990) work on late modernity and personal risks. The Foucauldian/governmentality approaches to risks (e.g. Hänninen & Karjalainen 1997), Niklas Luhmann's (1993) notions of risk and decision-making, and Ian Hacking's (1990) and François Ewald's (1993) genealogies on the formation of probability and risks are also not reviewed, although all of the latter four have served as an inspiration especially through my use of Stephen Collier, Andrew Lakoff and Pat O'Malley as accounts of risks and security.

What motivates the selection of Beck and Furedi is that they first of all handle processuality and change: much like classical sociology did in the 19th and 20th century, these theories of risk aim to reflect and diagnose upon contemporary societal and cultural transformations. Beck and Furedi were also selected to illustrate that the issue of risk is controversial and the borders of theories are often debated: the writers frequently disagree with each other, and Furedi targets many of his criticisms towards Beck. Finally, as a practical point, both theorists have been used to analyze or have written themselves about critical infrastructure protection, which makes it a good starting point for this study. However, my aim is not to retort to the rather general characterizations Beck's and Furedi's theories, but in the third section, the metadiscourses of risk society and risk culture are downgraded to the practical levels of organizations.

Being at-risk in the risk society

German sociologist Niklas Luhmann had distinguished between hazards and risks in his lectures already in the early 1970s. Anthropologist Mary Douglas had also devoted several books to risk and culture in the early 1980s (e.g Douglas & Wildavsky 1982; Douglas 1985). Yet, up until 1986, the theme of risk had remained the preserve of insurance experts and specialists in the field of risk assessment (Adam & van Loon 2000, 12). It was the highly influential literature on a new "risk society" that opened up the issue of risk for wider social science debate.

The theories of risk society have been led by the German sociologist Ulrich Beck, who released his most influential book *Risikogesellschaft* (Beck 1986) right after the Chernobyl nuclear accident. The book sold in its first five years 60 000 copies, which only a very few post-war social scientific books have accomplished. *Risk Society* also played a leading role in the recasting of public debates in Germany on ecological politics and it captured the public imagination during catastrophes like Chernobyl, Bhopal, Exxon Valdez and more recently the BSE outbreak. (Lash & Wynne 1992, 1; Adam & van Loon 2000, 12.)

According to the theory,

> we are now said to live in a changed world. This is the world of new, incalculable, unpredictable and catastrophic 'modernisation risks' such as global warming, depletion of the ozone layer and nuclear contamination. These emergent risks are held to have been created by the very success of modernity: its scale of production, its pace of innovation and its compression of time and space. (O'Malley 2004, 2.)

The risk society has two kinds of impacts (see Beck 1992). First, according to Ulrich Beck, risk experts like scientists, insurance companies and governments are still clinging to the old world, asserting that risks are knowable and governable. Here Beck is referring to the risk calculation of insurance, which did several assumption on the quality of events: first, that the probabilities of accidents are indeed calculable; second, that the risk is calculated at the level of population (all the workers of a factory, for instance); and third, that by relying on statistical methods risk has the kind of objectivity that descriptions of isolated bad events lack (Ewald 1993, 18). To these experts Beck (1993, 541) has a determined answer: the new atomical, chemical, ecological and genetic risks are not restricted in time and space, not accountable to the rules of causality, blame, or control, and not compensatible or securable. In fact, probabilistic predictions deliver insecurity rather than security, for the more that science discovers, the more it demonstrates that life is saturated with risks (O'Malley 2004, 2). Furthermore, the catastrophes of risk society frequently prove that scientific predictions were wrong, and the authority of scientific expertise is beginning to be undermined. Lately Beck (2002) has also extended these claims to encompass natural catastrophes and terrorism.

Inside what Beck (1995) calls *reflexive modernization*, the dissolvement of scientific expertise is accepted and risks become a question to be solved politically in the "world risk society" (Beck 1999). Global interdependencies cause risks, which then cause the compulsion to – but also the opportunity at – arriving at

"cosmopolitan" solutions (Beck 2006, 22). This does not mean just more room for traditional parliamentary and trade union politics, but rather a categorial transformation of "politics" to "subpolitics". The latter encompasses the private sector, business and science as well as for example non-governmental organizations, citizens' initiatives and the public sphere (Beck 1995, 18-19; 22). In Beck's (1995, 18) own words, "the political breaks open and erupts beyond the formal responsibilities and hierarchies".

Secondly, as for normal people, Beck's notion is that "(w)hen modernization reaches a certain level, (social) agents tend to become more individualized, that is, decreasingly constrained by (social) structures" (Lash & Wynne 1992, 2). The crises of industrial society implie that new opportunities for action open up, as the certainty that was once connected to the industrial society dissolves – like trust in scientific expertise, tradition, one's social class position or the normal life conduct. Living and acting in uncertainty becomes a basic experience and "who can do this and learn this, how and why, becomes in turn a key biographical and political question of the current era" (Beck 1995, 12). More and more areas of life become dependent on individuals' decision-making, and dangers are also experienced as personal risks relating to one's way of life (ibid, 14; see also Luhmann 1993, 44). Moreover, the individualization does not remain private, but becomes subpolitical in the sense that was described before. In Beck's (1995, 18) view, we are experiencing a renaissance of political subjectivity in the risk society.

As can already be seen, Beck's concept of risk is very broad, some claim up to the point of being inconsistent (Campbell & Currie 2003, 152). When one talks about risk in the Beckian sense, one deals with technological hazards as well as scientific expertise, politics, globalization and individual decision-making and life conducts. Indeed, the function of the concept of risk for Beck is not to be analytically exact. Rather, by turning his attention into the problem of risk, Beck aims to warn the society of dangerous modern technology and environmental damage (Luhmann 1993, 5). In doing this risk is also a normative concept, which is meant to lead into new political action under Beck's idea of reflexive modernization.

One well-known example of Beck's type of thinking is the *precautionary principle*, which claims that certain technologies, like high-voltage electricity lines which cause electromagnetic fields, should be proscribed even though no conclusive scientific evidence exists to prove that they are harmful. The fact that many Western governments have taken the precautionary principle aboard suggests that waiting until the level of risk has been determined is itself today often considered an "unacceptable risk" (O'Malley 2004, 3). Like Beck's risk, precautionary principle is also a politically normative concept, which aims to warn people about unforeseen events and regulate the ways in which they are handled. And it has an individualized element in-so-far as more and more risks of technology are attributed to decisions – one can for example always decide to proscribe high-voltage electricity lines near dwellings even without conclusive evidence to back this up.

These ideas can now be applied to the security of electricity supply. One could begin by asserting that electricity blackouts are rarely as serious events as the "modernisation risks" of the risk society. Even the long electricity outages that have been experienced for example in Sweden and Canada cannot be empirically compared to global warming, depletion of the ozone layer or nuclear contamination, as it is suspect whether blackouts and also water supply disruptions cause as major societal, political and personal shifts as Beck envisions (Silvast 2006; Lahti 1998). Still, the notion of risk society holds some promise in the case of electricity blackouts when one does a downgrade on it: the question of risks is not necessarily about the macro-sociological change of the whole industrial society, but rather of changing mechanisms of knowing and assessing risks. This approach has been developed by anthropologist Stephen Collier (2006; 2008), who uses the side of Beck to study critical infrastructure protection and risks which are deemed uninsurable.

As we recall, the formula of the "risk society" was as follows: First there are routine ways of calculating and governing risks. Then something new and unpredictable happens. The event is not necessarily an accident: on the contrary,

maybe the previous ways of governing have been too *successful*, becoming too specialized to notice novelties. Finally the knowledge and action of those who manage uncertainties is taken to a very different direction from before. This new direction is fused with subpolitical conflict, ambiguity and more individualized decision-making than before.

The order of events seems to hold true to the more serious disturbances of the electricity supply. For example, Western security experts had been advocating for the awareness of electricity as a "critical infrastructure" at least since the 1970s (Collier & Lakoff 2008), but it was a major storm in 2001 that made the subject actually manifest in the electricity market regulation in Finland. The storm with its material consequences for the electricity network led to an official investigation into blackouts and later the inclusion of a "standard customer compensation" in the Finnish Energy Market Act. According to this new piece of legislation, the electricity network companies should always compensate for their customers outages which last longer than 12 hours. In 2008, number of blackouts also entered as a parameter to the official regulation of electricity markets. In similar vein, in the light of the recent bank service failings in Finland, a standard compensation legislation was proposed for the outages of banks' web services.

These legislations posed a new style of knowing about security of electricity supply. It is a different matter to define a storm as a *risk* towards electricity users than to define it as a natural disaster, as the risk-based thinking builds a new type of relationship between the electricity companies and their customers. The arguments that were given in favour of the standard compensation legislation declared that customers should "receive compensation" and "get the harms repayed" from blackouts – which accordingly had not properly taken place before. The law proposals also had an emphasis on steering the operators to acknowledge future events.

> Completely uninterruptible electricity supply is not possible, but the proposed standard compensation method tries to influence the distri-

> bution system operators' actions by steering them to prevent interruptions from happening and to fix in interruption situations the damages that caused the interruption as fast as possible. The proposal strives especially to influence upon minimizing the number and duration of interruptions caused by weather conditions. (Parliament of Finland 2002.)

The newest policy initiative in Finland (Ministry of Trade and Industry 2006) also includes a precautionary idea, which suggests that there could be a maximum yearly level of blackouts, which should never be exceeded. In Sweden, the Government has all the more decided that there will not be blackouts longer than 24 hours after 2011. At the same time the risk is being individualized, with personal emergency power generators recommended by the authorities to those customers who suffer very much from blackouts (Ministry of Trade and Industry 2006, 74).

It is likely that none of these shifts would have taken place without the blackouts whose impacts came as a surprise to the prevailing expert reasoning. What's more in a Beckian style, the new approaches shift the focus of reasoning about infrastructures: from providing the "goods" (universal infrastructure for mass consumption) to distributing the "bads" (the just compensation of infrastructure failures).

But as tempting as Beck's well-known models may be, I should still point out that they center on the macro-sociology of social, cultural and political change. Beck's theory stems from his experience as a sociologist of industry, labour and family, and its target is nothing less than industrial modernization itself. This is exemplified by the *Risk Society's* subtitle, *Towards a New Modernity.* Yet it is problematic, at least from a general theoretical perspective, to downgrade these grand ideas to certain situated styles of reasoning. I shall return to Beck's current, more empirically oriented research project in my conclusive subchapter. But before that, another approach to risks is introduced. It is as general in scope as Beck's, but almost opposite in its attitude on future uncertainties.

Exercising choice through risk

In the classical sense, the formulation "to take a risk" contains the assumption that individuals can exercise choice: people are seen as active subjects who explore and experiment and control their own destiny (Furedi 2007a, 79-80). This kind of account was exemplified by the economist Peter Bernstein (1996) in his hugely successful book *Against the Gods: The Remarkable Story of Risk*. Another significant writer to mention here is the influential and frequently media-covered UK sociologist Frank Furedi, whose various books span for instance the culture of fear, the politics of fear and terrorism. In the following, I will focus on Furedi's theories on the ground that he is a sociologist, but also draw from some of Bernstein's views.

I shall start with a fundamental difference to the previously reviewed theories. In the theories of the "risk society", the unknown future was a vast problem for decision makers. Peter Bernstein's view is however diametrically the opposite: he asserts that "tremendous idea lies buried in the conclusion that we simply do not know. (...) (W)e are not prisoners of an inevitable future. Uncertainty makes use free." (Bernstein 1996, 229.) He also maintains that "the capacity to manage risk, and with it the appetite to take risk and make forward-looking choices, are key elements of the energy that drives the economic system forwards" (Bernstein 1996, 3).

The appetite to take risks is the kind of spirit Frank Furedi also supports (Furedi 2007a, 79). Yet he sees today's culture to have much lower expectations:

> This worship of safety has influenced attitudes towards all aspects of life. It has fostered an inclination to continually exaggerate the problems facing society, which in turn has encouraged a cautious and anxious outlook. (...) The outcome of these developments is a world-view which equates the good life with self-limitation and risk aversion. (Furedi 2006, 153.)

Ulrich Beck in Furedi's view (2006, 63) is the most articulate proponent of the "model of a society which is continually under threat from technological development", whence risk is associated with the advance of knowledge and marks an aversion to technology – a viewpoint also supported by the influential sociologists Anthony Giddens and Niklas Luhmann according to Furedi (ibid). Furedi's view on risks is however different, which can be told from the above use of the concepts like "attitudes", "outlook" and "worldview" in his diagnosis about modern-day risk culture. Furedi does not connect the growth of risk consciousness with technological advance or a growing number of dangers. Instead, risk reflects for him a "moral climate" where traditional values have weakened. In Furedi's view, there is hardly any consensus anymore on the basic questions facing people, which used to be answered by the nation state, traditional authority and one's own community. Also politics becomes futile – once again in contrast to the theories of risk society, which were optimistic about the renaissance of political subjectivity because of risks. In Furedi's mind, "the very idea that anybody could achieve any positive results through political action is often dismissed as naive or arrogant." (Furedi 2006, 174.)

In this vacuum of generalized values, it is normal for risk-aversion, self-limitation and the exaggeration of problems to prevail (Furedi 2006, 153). The lack of consensus about values also reinforces the individuation of risks – a process which the theories of risk society noted, but for different reasons. As the perception of being at-risk influences action in general, many people are literally on their own with their insecure feelings (Furedi 2006, 75).

Furedi could have left his diagnosis at this grim point, but he also has a solution which is unusually normative for a sociological theorist. In the book *Politics of Fear,* there is a concluding chapter on "humanizing humanism", which aims to found a new *humanist paradigm* to replace the *vulnerability paradigm* of the culture of fear. According to Furedi (2007a, 159), people need "the freedom to engage with new experience, not just the formal right to choose but cultural support for experimentation and individual choise making". To put it differently, this

project ought to mark a return to the classical meaning of risk.

An evident similarity between Beck and Furedi is the use of the concept risk in the broadest manner. Furedi (2006, 25) admits that "(n)o definition (...) can exhaust the meaning and usage of the risk concept". The concept of risk is based on the difference between reality and possibility, and the meaning of risk shaped by how "society regards its ability to manage change and deal with the future" (Furedi 2006, 26). Furedi's own interest is on the contemporary discussions, which he expresses through the conceptualization of being "at risk". It is a pervasive, but an ambigous concept that denotes certain types of people who are vulnerable like children and heavy smokers, and certain situations like walking out at night or living near power stations. Being at risk implies the autonomy of the dangers that people face: those who are at risk face hazards that are independent of them (ibid, 27). The most usual thing to do with these risks that are seen as minimally subject to human intervention, Furedi (ibid, 27) criticizes, is to avoid them altogether. Accordingly the decision to take a risk has been replaced by the emphasis on avoiding dangers.

I will now move back to the security of electricity supply. It is easier than with Beck as Furedi has commented infrastructure security in several occasions. Two sources are used here: Furedi's (2007b) newest book, *Invitation to Terror: The Expanding Empire of the Unknown*, and an article which deals with Prime Minister Gordon Brown's new security policy initiative in the UK. The former piece takes on the subject of technological systems early on: Furedi (2007b, 12–16) notices how the same technological systems which were seen as a source of strength in technologically sophisticated communities are now symbols of vulnerability, like in the concern that aeroplanes or the electricity grid could be used as a terrorist weapon. Inside emergency management, the being at-risk is further illustrated by the new concept *resilience*, which means the ability of technological systems to withstand or recover quickly from difficult conditions. In Furedi's (2007b, 18–19) view, resilience implies that *little can be done* to prevent destructive events. In fact, resilience's tracks lead back to the generalized feeling of vulnerability:

“Vulnerability is perceived as the norm and resilience is presented as a potential counter-trend against it.” (ibid, 18.)

Furedi has spotted an important shift, but one could also take another direction with the concept of resilience in regards infrastructure risks. Aaron Wildavsky, most known for founding the cultural studies of risk with Mary Douglas, has been very affirmative of the concept of resilience, and appreciates its concrete policy implications: “The experience of being able to overcome unexpected danger may increase long-term safety; but maintaining a state of continous safety may be extremely dangerous in the long run.” (Wildavsky 1988, 79.) Instead of “maintaining a state of continous safety” failure should be seen as central to engineering and “(f)ear of failure inhibits learning” (ibid, 83).

Let’s use Wildavsky’s argument here and connect it with Furedi’s value of individual choice making: inside electricity supply security, the shift towards resilience can be seen as paving way for more risk-taking and experimenting than before, especially when particular individuals and situations are concerned. One Finnish example of a new, more experimenting and individuated stance towards infrastructures are the personal emergency power generators, which are meant to function when the main electricity distribution fails. A recent Finnish initiative (Ministry of Trade and Industry 2006, 56) says that the "quality of electricity distribution has to be improved optimally in regards the society" and "it is not acceptable that all the customers of a distribution company pay for the improvement of one customer’s quality". Hence, particular critical customers are encouraged to make investments for their own emergency power systems in order for the whole system to be more resilient, or to phrase Wildavsky: by being able to overcome “unexpected dangers” one increases “long-term safety”. This is the kind of "appetite to take risks" and "forward-looking" action that Furedi could well support.

Of course the fostering of a situated awareness through risk is not recently developed. One is especially reminded of Joseph Schumpeter’s and Frank Knight’s characterizations of enterpreneuship as propensity for risk-taking behaviour. I will next use this framing to interpret the relationship between risks and the market re-

forms of the electricity sector in Finland.

In the Finnish electricity market reforms of the 1990s, competitive markets were encouraged for electricity generation, selling and exporting. Electricity distribution and transmission – the so-called "natural monopolies" – have also been established more regulation in order to promote fair competition and protection of consumer rights. Especially central for our handling is to notice how there has been a new emphasis on an unknown future. Planned economics, the main method the for managing electricity infrastructure in Finland in the 1980s, were not seen as feasible providing for "functional markets and healthy competition, which guide the resources in the economy in the most efficient way" (Parliament of Finland 1994). It was precicted that after the reforms, "the electricity system will become much more dynamic than before. The need to foresee future events grows, which pushes for several contracts between the new stakeholders. With these contracts, the sufficient security of electricity production and distribution can be provided for in the markets." (Parliament of Finland 1994.) So, not only market relations, but more specifically also the predictability and kind of resilience of market relations has acquired more importance than before.

All of this is not to say that the shift towards resilience in supply security is practically the same thing as neoliberal market thinking. But they seem to encompass similar styles of expert reasoning. Indeed, from Furedi one can infer that perhaps the market reforms and seeing electricity users as consumers have not only represented one-sided marketization (cf. Graham & Marvin 2002; Collier 2005): on the contrary, they can encompass styles of reasoning that foster the *value* of engaging with new experiences and individual choice making.

A second question that one needs to address while using Furedi's concepts is the following: is the domain of "being at-risk" expanding in the infrastructure supply security? Furedi seems to think this when reviewing PM Brown's new security policy. Accordingly, the government policy is based on the idea that

> in the absence of clarity about the nation's adversaries, it is best to

> treat any source of insecurity as a security problem. As a result, there's little to distinguish a "security threat" from something that is just "uncertain". This erosion of the distinction between insecurity and uncertainty has led to a situation where the meaning of security expands and expands until it encompasses virtually any ambiguous or risky human experience. (Furedi 2008.)

It is hard to disagree with Furedi about the expansion of the domain of security. For example, Finland's new Strategy for Securing the Functions Vital to Society (2006) lists "society's vital functions" to be the management of government affairs, international activity, national military defence, internal security, functioning of the economy and infrastructure, the population's income security and capability to function and psychological crisis tolerance. The new Finnish proposal for a programme on internal security also mentions preventing cybercrime as one of its key areas. It is a distinct contrast from before the 1980s when the domain which is now called "vital systems security" was understood not more than as the planning of economic military defence (see Seppinen 1996). These kind of lists would then have been considerably shorter.

However, the criticism that "the meaning of security expands" is not very original. Like Collier and Andrew Lakoff (2004, 17) have noted in their study on vital systems security from the 1960s onward, it has been a traditional for the critics on the left to link any effort towards security with the militarization of civil society, the repression of individual freedom, and the expansion of empire. In the Finnish history of critical infrastructure protection, this has been pervading: many attempts to introduce new protection of civil infrastructural systems were faced with hostility from the leftist parties, who saw it as militarization against the Soviet Union. For example, in 1966 when Finnish security officials had pressed leaflets for home dwellers on preparedness for crises, the Government proscribed their distribution on the ground that it would be creating a "war hysteria" (Seppinen 1996, 63).

Here instead of taking Furedi's already tried road, I shall go along with Collier's

and Lakoff's idea and develop it further in the following subchapter:

> Our suggestion is that it might be more analytically productive not to ask how much or how little security is appropriate, or whether security must at the expense of other values such as liberty or welfare. Rather, it is more appropriate to ask which forms of collective security are in question, what kinds of expertise are being mobilized to provide security, and how the politics of security are changing? (Collier & Lakoff 2004, 17.)

Finally a critical note that is similar to Ulrich Beck. As compelling as some of Furedi's views may be, it is worth remembering that they are very all-embracing, similarily to Beck's older work. Furedi takes one guiding principle – that people are able to take risks and advance their destinies, but a pervasive mood of fatalism prevents this – and applies it to almost all aspects of life. Most likely this is his critical strength: the drawing together of a number of loosely connected themes, which have diagnostic insight in-so-far as they are familiar to people. But it also lacks analytical clarity and is in fact very much disconnected from everyday life situations. Particular situations are simply unimportant for the theory: Furedi (2006, 28) suggests that in the "free-floating anxiety" of the culture of fear, risks exist independently of any particular act or individual (ibid, 28). But as criticism (Tudor 2003, 245-246) has pointed out, this runs the risk of reifying the "pervasive mood", "moral climate" and also "society" (e.g. "*society's* disposition to panic") which Furedi says are causing peoples' actions to be fearful. Furedi's is a culturalist account, which leaves much questions about the link of culture and everyday activities.

Towards a pragmatic picture

In this subchapter, I shall build the theory for my dissertation. The chief aim is not to abandon the afforementioned sociological theories and their many critical

strengths. But I want to keep away from their tendency collapse the diverse situations and technologies of risk into one undifferentiated category (O'Malley 2004, 6), whether it is a "risk society", "culture of fear" or "free-floating anxiety".

Here one can take conduct from pragmatist John Dewey's (1930) well-known work, *The Quest for Certainty*. Let's start by connecting results from empirical research of infrastructure risks (e.g. Lahti 1998, Silvast 2006; Schulman & Roe 2007; Schulman et al 2004) and Dewey's pragmatism. First, it has been empirically pointed out that every uncertain situation is not pervaded by the risky character of a "moral climate" or a "society". Also, every action as a whole is not dubious or problematic. It is much more productive to look into concrete *problems* and objects of inquiries that locate what the trouble is and facilitate methods to deal with them (Dewey 1930, 223). To frame things in this way, "(u)ncertainty is primarily a practical matter. It signifies uncertainty of the issue of present experiences; these are fraught with future peril as well as inherently objectionable" (Dewey 1930, 223).

In order to do this, I need to return to the concept of risk and shift its common social theoretical understanding. Very often risks are understood as acts of destructions and hazards – unfortunate events which can and ought to be prevented from happening. But infrastructure risks, when they are understood as concrete problems in infrastructural organizations, are not realized only once the lights go out, the tap water turns brown or the traffic is congested. To put it the other way around, infrastructures are not reliable until they fail (Schulman & Roe 2007, 43). On the contrary, it is a routine result of organizational studies that infrastructures are "balky systems": "Their behaviour cannot be taken for granted with stable managerial protocols, but they have to be 'nursed' with constant adjustements in strategy, updating of previous understanding of how they work and improvisational behaviour among operators." (ibid, 44). It is useful to draw an analogy here from a very different territory of expertise, that of professional boxing, which Loïs Wacquant (2004, 237-238) researched in a participatory fashion. Where as training in the boxing gym happens in a "very time-tested and nearly scientific

manner", "(e)veryone knows intimately, from having suffered in his own flesh, that you hardly have time to step back and reflect in the ring, where everything takes place based on reflex, in fractions of a second. The head is in the body and the body is in the head."

So, risk as a potential breakdown is an integral part of operating infrastructure technologies. Electricity grids, for example, can assume a huge number of states through their diverse components with different age, reliability, capacities and start-up times. The operation of the grid requires real-time management of risks, and the need is intensified by the unpredictable effects of weather, the behavioural patterns of the electricity users and the competitive electricity markets with their regulation, as well as the arrival of infrastructure service systems which extend across single organizations and agencies and also across nation states. In other words, the infrastructure has to be actively achieved in order for it to function (see also Lehtonen 2004, 195; Callon 1991, 144-145) and the utility organizations are constantly being constructed and reconstructed in an ongoing process (Scott 2004, 13). Breakdowns, then, can be understood not merely as irregularities of the systems, but also as being "embedded in the banality of the organizational life and facilitated by (...) routinization (and) organizational and interorganizational structures" (Vaughn 1996, xiv) like the Challenger explosion was according to Diane Vaughn (1996; see also Reason 2000, 1998).

It is interesting to notice that Ulrich Beck has also shifted his theory of reflexive modernization recently towards an empirical research program. It now deals with more concrete problems than before, like the taking of action and making decisions, and problems faced in terms of attributing responsibility (Beck & Lau 2003, 531; see also Silvast & Virtanen 2008). Viewed in the light of empirical research, the problem with Beck's older work was that he was always referring to the crisis of scientific calculation of risks *in general* (Collier 2008, 230, original emphasis), while there are many specific practical situations which can be different from that. Even in his newer more empirically qualified work, Beck still insists on the erosion of legitimate expertise as a "structural logic that can be 'demonstrated'

Style of reasoning	The concept of risk	Related concepts	Ontological choices	Perceived transformations
the risk society	A warning sign of modern technology and environmental damage, and lately also of terrorism and natural catastrophes	reflexive modernization, subpolitics, globalization, cosmopolitanism, expertise, individuation	The objectification of the transformations of society	The arrival of incalculable, unpredictable and catastrophic "modernisation risks", the globalization of these risks, increasing individuation
the culture of fear	The marker of how society regards its ability to manage change and deal with future	mood, values, world-views, free-floating anxiety, vulnerability, individual choice-making	The objectification of values, moods and worldviews	A moral climate where traditional values have weakened
organiza-tional accidents	An integral part of the operation of infrastructure organizations	balky systems, routinization, banality of organizational life	Organizations as processes which are created and recreated actively	The arrival of service systems which extend across organizations and agencies

Table 1: Distinct theories of risk as styles of reasoning

in domain after domain" (Collier 2008, 245) – a research strategy which is not unlike of Frank Furedi's diagnoses. One can, however, be more specific as regards the level of analysis when the results and starting points of empirically and pragmatically oriented research are addressed.

The different theories that were reviewed are summarized in table 1. My main conclusion of this review is the following: *The empirical case of infrastructure failures in utility organizations can usefully shift the social theoretical understanding of the concept of risk. Instead of risk warning the society about all the unwanted side-effects of modern technology or marking how different societies and cultures regard their ability to manage change and deal with future, risks can be seen as practical problems to do with human doubts and beliefs. The taking of risk, and hence risking breakdown, is then in point of fact an integral part of operating infrastructure technologies. Risks understood in this sense can be embedded in the banality of the organizational life and facilitated by routinization and organizational and interorganizational structures. If infrastructure technologies are providing some of the critical ingredients in making the stability of communities and societies, then this new understanding of risk is important to acknowledge for social theory.*

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