Risk of Terrorism: A Scientifically Valid Phenomenon or a Wild Guess? The Impact of Different Approaches to Risk Assessment

Critical Approaches to Discourse Analysis across Disciplines
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Abstract

This article discusses different approaches to terrorism risk assessment. Different approaches to risk have different implications for communication and actions in society. The most prominent implications are the foundations of risk assessment, how risk is to be interpreted and what kind of knowledge risk pictures represent. Positivist approaches to risk assessments are contrasted with social constructivist approaches. We argue that a positivistic approach to risk legitimizes the use of worst case scenario thinking, endorsing precautionary terrorism counter measures which could lead to significant changes and hamper democratic discussions about the implementation of terrorism security measures in society. We recommend the Bayesian approach to risk analysis because this approach deals with uncertainties in a consistent way. However, there is a need to investigate the effect of risk management strategies in tackling terrorism risk. A promising point of departure could be empirical studies based on discourse analysis, as these would increase our understanding of how terrorism risk assessments are connected with power and subsequent societal perceptions of the terrorism threat.

Keywords: risk, risk analysis, risk management, terrorism, discourse analysis

1. Introduction

Most western countries regard terrorism as the greatest security challenge today. The terrorist attacks in the USA on 9/11 led to the American administration's declaration of 'war' against terrorism. The 'War on Terrorism' is the most extensive counter-terrorist campaign in history and the most important conflict since the end of the Cold War. The military invasions of Iraq and Afghanistan are visible instances of the 'War on Terrorism'. The 'War on Terrorism' is also an important strategy in US homeland security (Jackson 2005). Protection of critical infrastructures is another. Since the outset of Europe's role in the 'War on Terrorism', the protection of critical infrastructures in European countries has been central in their anti-terrorism effort (Burgess 2007). Risk analysis is proposed as the appropriate tool for providing support in protecting critical infrastructures (GAO 2005). In this paper we explore how foundations of the risk concept influence the inherent understanding of terrorism risk. Public opinion is framed through the communication between the different parties in society. In order to

understand risk mitigation, emergency preparedness and terrorism response measures, we argue that scrutiny of terrorism risk discourses is crucial.

There has been some question as to whether or not terrorism is a risk that can be mitigated by utilizing rational analysis (Beck 2002; Ericson 2006; Slovic 2002). Ericson (2006) claims that terrorism strikes at the foundation of the 'risk management culture' that dominates contemporary Western societies, because it is a stark reminder of the limits of risk management: 'It brings home the potential ungovernability of modern societies and how those with little power can work cheaply and effectively to destroy' (Ericson 2006: 347).

Terrorism risk analysis implies that we are able to systematize knowledge about the terrorism threat. However, both the concept of terrorism and the concept of risk have been extensively debated and contested. The difficulties with defining terrorism have been a topic in the UN, national and international terrorism-combating agencies and academia for several decades (Schmid 2004). Schmid claims that lack of a universal definition of terrorism serves both to encourage it and to maintain double standards of morality.

However, a growing consensus on the core meaning of terrorism seems now to be emerging among researchers and governments. Terrorism is often described as a set of methods or strategies of combat rather than an identifiable ideology or movement. Terrorism involves the premeditated use of violence against non-combatants in order to cause psychological fear in people other than the immediate targets (Bjørgo 2005). The outcome is death and injury to people and damage to public and private property with the intention to cause economic loss, intimidate a population or to compel a Government or an international organization to do, or abstain from doing, a particular act. Although the consequences of a terrorist attack can be devastating, it is not the actual destruction or killing that is a terrorist's aim, according to the definition. The destruction is instead a means to achieving other goals. Nevertheless, the selection of objectives for terrorist attacks is not arbitrary: there are strategic goals related to whom, where and when to strike. These instrumental intentions make the use of risk management principles worthwhile.

Despite the difficulties with defining terrorism, international organizations like the UN, NATO and EU have put the fight against terrorism high on their agendas. Not only this, but domestic campaigns against terrorism have also involved massive investments of resources and personnel; new legislation has been enacted, new departments and agencies have been created, new national strategies have been developed and new federal and local programmes have been initiated (Jackson 2005). New official bodies with a mandate to investigate and predict the risk of terrorism have been established, and intelligence services have been reinvigorated.

In Norway, the Norwegian Police Security Service (PST) prepares both general and periodic threat assessments relating to the risk of terrorist attack. PST operates with four threat levels: low, moderate, high and extreme (PST 2008):

- **Low:** The likelihood of a terrorist attack is low. One or more parties may have the intention, but are not thought to have the capacity, to strike at specific interests.

- **Moderate:** The likelihood of a terrorist attack is moderate. One or more parties may have both the intention and capacity to strike at specific interests.
- **High:** The likelihood of a terrorist attack is significant. One or more parties have the intention and capacity to strike at specific interests. There is an unspecified threat.
- **Extreme:** The likelihood of a terrorist strike is extremely high. One or more parties have the intention to strike at specific interests. There is a specific threat. No further warnings are to be expected before a strike is carried out.

> Only in very rare cases will we [PST] be able to disclose publicly all the information and analysis we use in arriving at a threat level. This is because the basis for our decision will primarily be material that is classified pursuant to the Security Act and Regulations. PST's staff members are legally obliged to observe strict secrecy and to protect the security of information to which they gain access.

The PST has developed significantly after 2001, in personnel, mandate and resources. Changes in the risk landscape after the 'Cold War' led to debates on whether a police security service was needed and what mandate such an agency should have. Recognition of the increasing terrorism threat against Norway and other Western countries led to a renewal of PST's mandate. The main priority of the PST is now to investigate and monitor the terrorism threat against Norwegian society and to provide the Government and other actors in society with recommendations for managing risk in order to prevent and mitigate acts of terrorism.

The PST's work builds on traditional risk management principles (ISO 2005) applied to the phenomenon of terrorism. Their assessments of threat levels are applied in security advice for 'the fabric of Norwegian society' and in their role in counter-terrorism work, encompassing 'prevention of acts of terrorism being planned and perpetrated in Norway'.[1] But is it really obvious that terrorism is the type of risk that can be dealt with through risk analysis and traditional risk management principles?

This paper questions how powerful the use of the risk concept is as a tool for identifying and managing the terrorism threat, in the context of Norwegian society as an example. Furthermore we investigate the connection between the foundations of the risk concept and subsequent decision criteria. In a democratic society like Norway it is important to understand the possibility elected politicians have for becoming involved in critical decisions (encompassing terrorism risks) influencing societal development, and how this participation takes place in real decisions. Thus, we propose that risk management should be scrutinized by empirical studies based on discourse analytical frameworks in order to reveal the core of societal responses to the alleged terrorist threats.

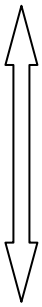
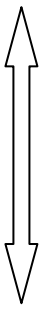
2. Foundations of Terrorism Risk Approaches

What knowledge is it possible to obtain regarding the phenomenon of terrorism risk? The dispute between positivism and constructivism is a long-standing topic in risk research. The positivist philosophy rests on a dualistic principle implying a separation between the mind and the external material world. Knowledge in this perspective is to discover the world as it really is and to discover the laws of causality in the real world. Constructivism acknowledges the cognitive process of actively constructing models out of the perceived complexity of the world, rather than discovering its reality (Le Coze 2005). Do risk analysis results represent objective probabilities and risk estimates or do they only reflect the convention of an elite group of professional risk assessors?

Risk and reliability analysis tools have been developed since the Second World War, first and foremost dealing with technological systems. Since then, risk assessments have been employed in high risk industries, such as the nuclear energy, chemical, petrochemical and transport industries. Incidents, accidents and subsequent investigations have revealed the significance of human and organizational elements in the production of undesired events. In consequence, focus on the human and organizational factors in risk analysis has increased sharply and these are now important aspects of the analyses conducted. Furthermore, most societal sectors have increasingly adopted risk management as their safety strategy principle (Adams 1995). Risk assessments are part of the regulations in practically all sectors from land use planning to the health and food industry. The risk domain has thus become multi-disciplinary, producing assessments from anthropologists and sociologists to engineers, economists and behavioural psychologists.

Table 1 depicts different aspects of the risk concept which are important to how risk is understood and reflected when the term is used in terrorism risk studies. These elements are taken from the distinct basic scientific philosophies spanning from positivism (Carnap 1967; Scheffler 1982) to social constructivism (Berger and Luckmann 1967; Douglas and Wildavsky 1982; Feyerabend 1978). Kristin Shrader-Frechette (1991) discussed the different stances and found a middle way she called 'Scientific Proceduralism' as her recommended approach, in which facts and judgements are combined. Shrader-Frechette also combined risk analysis and risk evaluations and made no distinction between those who carry out the analyses and those who use or are affected by them. Rosa (1998) has developed Shrader-Frechette's ideas into a framework he denoted Reconstructed Realism (Rosa 1998). Based on an assessment of the system's (world's) ostensibility (O) and repeatability (R) he advocates either grounded realism (high O and R) or social construction (low O and R). Rosa (p. 40) denotes post-normal risk 'a state of the world where there is a conjunction between uncertainty of outcome and human concern about the outcome'. He clearly distinguishes between the state of the world and our knowledge of the world.

Table 1. Major approaches to risk assessment

Philosophical foundation	**Risk expression**	**Risk interpretation**	**Risk analysis approaches**	**Assumptions**
Realism/ Naive Positivism  Critical realism/ Reconstructed Realism	Quantitative, 'strong models' $P^*(A) = f^*(q_i^*)$, $i = 1, ..., n$  Weaker models Semi quantitative, and qualitative	***Truth*** • Properties of the world • Evidence based • Expert oriented • Estimates of the underlying terrorism risk • Uncertainty is the imprecision of the underlying true risks	Classical probability theory • PRA/QRA • Risk matrices • Hazard identification Fuzzy logic Possibility theory Game theory Standard Bayesian approach Reconstructed realism/ Post-normal risk	Strong relations to established risk decision criteria, and subsequent decision making Normative risk management strategy
Scientific proceduralism  Social construction/ cultural relativism	Quantitative $P(A\|K) = f(q_i\|K)$, $i = 1, ..., n$ Models are tools to express uncertainties of the world Semi quantitative and qualitative Qualitative descriptions of risk	***Judgments*** of safety and security with respect to terrorism The risk results are expressions of the analysts' uncertainties about future events and outcomes ***Constructions***: Risk assessments are to be understood as a cultural or social phenomenon	Simplified Bayesian probability theory • PRA/QRA • Risk matrices • Hazard identification Research oriented sociological and anthropological techniques Descriptive or critical	Strong relations to decisions, but assumes an instrumental decision making context. Normative risk management strategy - - - - - - - - - - - Loose: risk information, but not necessarily part of a decision process

The philosophical foundation in the table is to be understood as a dichotomy of realism and constructivism, and the trend has moved back and forth between these two poles (Renn 2008). Risk is a highly practical matter, not one exclusive to academic controversies. Worldwide, people are being killed, injured and harassed by acts which stakeholders associate with terrorism. Risk communication is thus a major societal challenge.

Aven (2003) attempts to clarify different interpretations of risk (Aven 2003). He agrees with the general ISO definition saying that risk is the 'combination of the probability of an event and its consequence' (ISO 2002), but he has extended the definition into the generalization that risk is 'the combination of possible consequences and associated uncertainties' (Aven and Kristensen 2005: 2). As opposed to the majority of risk analysts Aven acknowledges that the risk concept is subject to personal judgement and thus constructed, but he also recognizes the existence of events in the world. Aven's view has many similarities with the combined stances presented by Shrader-Frechette and Rosa, while he also maintains the subjective approach to risk and uncertainty.

2.1 Revealing the True Terrorism Risks

In a world of natural laws and empirically validated theories, the assumption that there exist true underlying probability distributions of terrorism attacks against a system, for example Norwegian territory, is plausible. The task for the analysts is then to reveal the true risks, in order to develop measures and solutions aimed at reducing the risks as much as possible. The tools employed for estimating terrorism risk are various risk analysis techniques that may be quantitative, semi-quantitative or qualitative.

2.1.1 Quantitative Approaches

The most extreme realist presentations of terrorism risk are clear-cut numbers such as probabilities, frequencies or some kind of probability distributions, based on detailed models of the 'world of terrorism'. The system considered could be a critical infrastructure, for example the underground transport network in Oslo, or it could be Norway with its most security-critical elements (buildings, networks, key personnel, dignitaries, etc). Various quantitative risk analysis techniques, such as Fault Tree Analysis (FTA) and Event Tree Analysis (ETA), could be used to model the 'world of terrorism' (Contini et al. 2006; Garrick 2002; Harris 2004). The general solution is an expression of the risk, based on the relative frequencies approach, such as:

$$P^*(A) = f^*(q_i^*), \quad i = 1,...,n$$

where A is a terrorist act/event, such as the bombing of a metro station. The estimated probability, $P^*(A)$, is calculated from a model, $f^*(...)$, which is a simplified expression of the world, constructed from probability estimates of events or stochastic variables on a lower level, q_i^*, $i = 1,...,n$. These quantities could be for example the probability of groups with the intention to do harm to Norway and the probability that these groups have sufficient capacity to do so.

The empirical evidence is very weak, as hardly any relevant observation exists. In order to assign probabilities, the analysts must imagine an infinite population of similar systems and count the number of occurrences of specified events or realizations of variables involved. From this the estimates can be derived. A similar procedure could be applied for estimating the probability distributions and expectations for stochastic variables, such as the number of terrorist attacks or levels of damage associated with terrorist attacks. The estimated probability distribution $P^*(X < x)$ is to be understood as an expression of the true probability distribution. In principle the underlying models could consist of large causal models and/or effect models, drawing on psycho-social and cultural quantities as well as physical quantities. However, the complexity and resource consumption of carrying out the analysis increases proportionally.

What, however, is the meaning of the imagined population and the parameters involved? If we are to assess uncertainties of average performance of quantities of the populations, we must understand what they mean. The two levels of probabilities involved are the relative frequency interpreted

probability reflecting variation in the fictional population (aleatory uncertainty) and the subjective probability reflecting the analysts' uncertainty (epistemic uncertainty) about the correct relative frequency probability (Apostolakis 1990, 1993). In every conceivable situation, these uncertainties will be very large.

The standard Bayesian approach has much in common with the probability of frequency approach described above, but this approach deals with subjective probabilities and updating in accordance with Bayes' theorem (Apostolakis and Lemon 2005; Patè-Cornell 2002; Walden and Kaplan 2004). This gives a wider opportunity to involve expert judgements in the assignments of probabilities. Viscusi and Zeckhauser (2003) conclude that the only choice for dealing with terrorism risk and uncertainty is by use of subjective probabilities, but they warn about common biases such as embeddedness, hindsight bias and certainty premia in the probability assignments. Defining biases in probability assignments draws heavily on psychometric research (cf. Hogarth 1987; Kahneman et al. 2002; Kahneman et al. 1982). The underlying assumption in the standard Bayesian approach is that true terrorism risks exist.

Game-theoretical analyses have been increasingly employed to illustrate the dynamics of the aggressor-defender relationships (Arce and Sandler 2005; Frey and Rohner 2007; Hensgen et al. 2003), and some researchers have combined risk analysis techniques with game theory (Major 2002). The problem with uncertainty and vagueness in risk and reliability analysis led to the development of fuzzy set theory (Zadeh 1965, 1978), but so far this has not been applied in predicting terrorist acts. Many risk analysts acknowledge the uncertainty problems with identifying and calculating the risk of terrorism and thus tend to work with less precise analytical tools, such as semi-quantitative and qualitative approaches (cf., for example, Heikkilä and Schabel 2007).

2.1.2 Semi-Quantitative and Qualitative Approaches

The unclear phenomena associated with terrorism, for example actors with intentions to attack and their ability to change strategies with new information, challenge risk modelling based on standard approaches. Strict, precise and static event modelling seems not to be an efficient use of resources. There is much more need to look behind the risk pictures being formed, where the weight is put on:

- Potential terrorist threats and terrorist acts
- Barriers to prevent terrorist acts and their effectiveness
- Vulnerabilities of critical systems
- Terrorist influencing factors
- Possible counter-measures adapted to all stages from planning to execution of terrorist acts
- Special features of consequences of terrorist acts

- Likelihoods involved, both in the terrorist groups' intentions, their capacities and the effects of barriers and counter-measures

The analysis results could be summarized in risk matrices presenting the risk picture with likelihood and consequence intervals. This seems to be in line with the PST categorization of threat levels, spanning from low, moderate or significant to extreme. However, it is difficult to obtain a clear understanding of what these intervals actually mean, and what kind of assessments distinguish a terrorist threat as being for example moderate or significant. The PST is concerned with the term *threat,* which could be defined as an expression of intent to injure or punish another or an indication of imminent danger. The connotation of threat is much more concrete than the term risk, which is normally associated with a combination of the probability of an event and its consequence. A search for measures to mitigate terrorism threat calls for concrete answers, which could form the PST's understanding of risk.

Even though the semi-quantitative and qualitative approaches open up for broad multi-faceted factors capable of influencing terrorism risk, the understanding is still that the risk picture is an estimate of the true risks. The uncertainties associated with risk estimates are usually neglected in the analyses. This is critical and unsatisfactory, because the approach is strongly connected to absolute or clearly specified decision criteria.

2.2 Terrorism Risk as Somebody's Construct

A completely different point of view is that the risk presented is someone's expression of uncertainty about whether specified terrorist acts will occur or not within a defined time frame. In this case, the risk analysts expose themselves to criticism and reflection about the models and arguments used to arrive at their terrorism risk pictures. To speak of truth is meaningless in this perspective, and the models, the background knowledge and the data provided determine the quality of the analyses.

In the predictive Bayesian approach (Aven 2003) there is no sharp distinction between objective real risk and perceived risk. Risk is a judgment, not a fact. Professional risk analysts do not have the exclusive right to say what the risk is. Risk analysis methods and models are seen as nothing more than useful instruments for getting insights about the world and supporting decision-making.

In risk analyses conducted in accordance with the predictive Bayesian approach the focus is on observable quantities, which are uncertain at the time of the analysis but will be known in the future. These observable quantities might be for example the occurrence of a terrorist attack on a certain part of the critical infrastructure the following year. Since no one has complete knowledge about the future, it cannot be predicted with certainty. The uncertainties related to the future observable quantities are therefore epistemic: a result of lack of knowledge. Probabilities could be used to express the uncertainties about observables. Unlike the realist approach all probabilities are conditioned on the analysts' background knowledge. This means that the background knowledge always needs to be scrutinized as it provides the basis for the evaluation (Aven 2003). The fundamental

assumption behind this approach is that the risk analysis will form a basis for debate about security and not a presentation of the truth (Watson 1994).

A typical presentation of risk could be:

$$P(A|K) = f(q_i|K), \quad i = 1,...,n,$$

where an event A, say an attack on an embassy in Oslo, has been causing official concern. Investigations carried out could have revealed information about events on a lower level, for example that $B_1 =$ specified groups are planning attacks, $B_2 =$ the groups are looking for important western symbols, such as an embassy in Norway, and $B_3 =$ the group have a network in Norway ensuring sufficient capacity for an attack, which are all conditioned on the analysts' (for example PST's) background knowledge, K. Then, $q_1 = P(B_1|K)$, represents the analysts' uncertainty about whether the planning is being carried out or not. The causal relations between the events, $B_1, B_2, B_3, ..., B_n$ on a lower level, and the top event, A, could be modelled, for example through fault tree models. The associated uncertainties could then be combined, $f(q_i|K)$.

There are no differences between the realist and the constructivist approaches to risk with regard to the application of either quantitative or semi-quantitative modelling tools. However, the interpretation of risks, the way the analyses are conducted and the use of risk assessments are completely different.

Risk is often considered to be quantifiable and the uncertainties could be expressed by probabilities. This approach to risk could be regarded as narrow in the sense that risk is clearly and rigidly defined. The reductionist perspective may hide important information. Researchers advocate alternative semi-quantitative and qualitative pragmatic approaches, focusing on vulnerabilities, flexibilities and resilience of the systems considered, but very few have a clearly defined constructivist approach (Aven 2006, 2009).

2.3 Terrorism Risk Assessment as a Societal Risk Management Process

As opposed to the proponents of the clearly defined risk analysis approaches, there are also scientists with a much more ambiguous understanding of the risk concept. They relate all kinds of hazards and hazard-influencing factors to the risk concept, either anticipated by individuals or by groups and organizations within the community. These social science approaches to risk have developed from an initial concern about the management of technical issues drawing on rational actor models of behaviour, to include perspectives which seek to capture the complexity of risks and how risks are embedded in social and cultural contexts (Zinn and Taylor-Gooby 2006). Psychologists are concerned with risk perception studies dealing with how people perceive terrorism risks, their attitude to different types of risk and security measures, the diversity in risk perception between different groups, and what people find acceptable (Fischhoff et al. 2003; Lemyre et al. 2006; Sjøberg 2004; Viscusi and Zeckhauser 2003). These studies are meant to shed light on the risk

management processes in society but are not related to actual decision making. Psychometric research distinguishes between objective and subjective risk, and researchers have been particularly interested in heuristics and how people's risk perceptions tend to deviate from objective real risks.

An alternative perspective is advocated by those who are predominantly interested in the social and cultural aspects of the use of risk assessments. In this perspective nothing is a risk in itself, but what we understand to be a risk is a product of historically, socially and politically contingent ways of seeing (Douglas and Wildavsky 1982; Lupton 1999). In a constructivist perspective, risk is considered to be a complex matter which cannot simply be reduced to objective facts and probabilities. Tierney (1999) recommends a critical perspective to risk that focuses on the ways in which risk and power are related. She seeks knowledge about how political and economic power determines the ability to impose risks on others, shape public discourse about risks, and how positions on the acceptability of risks are lobbied. Beck has characterized contemporary society as the risk society. He claims that risk is a modern concept that inherently contains the concept of control; 'As soon as we speak in terms of "risk" we are talking about calculating the incalculable, colonizing the future' (Beck 2002: 40). In the risk society we enter a world of uncontrollable risks, and Beck regards contemporary terrorism as a threat that characterizes the global risk society.

Several scholars are critical of Beck's claim that terrorism risk cannot be managed. Aradou and van Munster (2007) claim that terrorism is seen through the lens of precaution, meaning that any level of risk is intolerable and encourages a worst-case scenario thinking which is willing to allow the use of any means to avoid the risk, including violation of civil liberties. Mythen and Walklate (2008) emphasize that security assessments are directed by 'What if?' questions that are problematic for law enforcement and criminal justice since this assumes that pre-emption is the only reasonable way of resolving terrorism. They also claim that a future-oriented risk-based approach enhances a worst-case scenario drive that reinforces a culture of fear (Furedi 2006). Amoore and de Goede (2005) discuss the effects of risk management principles used in the attempt to manage future terrorism risk. From the protection of borders to international financial flows, from airport security to daily financial transactions, risk assessment is emerging as the most important way in which terrorist danger is made measurable and manageable. However, they argue that the risk based approach results in the displacement of risk on to marginal groups and thus threatens their legal protection.

After 9/11, risk management principles based on precaution have opened the door to more pro-active forms of surveillance leading to a surplus supply of data and an over-prediction of threats (Amoore and de Goede 2005; Amoore and de Goede 2008; Aradau and van Munster 2007). The use of the precautionary principle and the pre-emptive strategy in military intervention, legislation and security measures has been contested by several scholars (McCullogh and Pickering 2009; Stern and Wiener 2006; Zedner 2006). These authors are sceptical of risk management techniques in the war against terrorism and they claim that pre-emptive measures and precautions are coming to dominate in the war against terrorism. These scholars also aim to

show that the assessment of terrorism risk actually entails predicting a person's intention. The difficulties of doing this result in groups or whole populations being subjected to terrorism counter-measures, whereby civil liberty values are threatened.

3. Terrorism Risk Management in the Context of Terrorism Risk Approaches

Terrorism risk management encompasses how a society treats the hazards of terrorist acts. Decision-making and the implementation of different risk reducing measures are of vital importance. We claim that the different approaches to terrorism risk support different conceptions of management. First we shall outline some risk decision criteria, and then we shall discuss how these criteria are affected by the chosen approach.

3.1 Decision Criteria

Absolute risk acceptance criteria are numerical values defined as limits for what should or should not be seen as acceptable risks. These values have been extensively employed in the safety management of high risk industries, defined as clear-cut probabilities of events, FAR (fatal accident rates), FN-curves (Frequencies vs. Number of fatalities), lines in risk matrices, etc. Reference criteria, such as 'the risks in this system are not to exceed (those in) similar systems', have also been common. In order to distinguish between the risk levels, use of three border criteria has been a recommended approach, stating an unacceptable region, an intermediate region and a negligible region (Aven, Njå, and Rettedal, 1996).

The as low as reasonable practicable (ALARP) principle could be regarded as the intermediate region described above. However, the ALARP principle could be generalized with no relation to defined borders at all. This implies that risk should always be scrutinized and assessed for better solutions based on a holistic view of all interests and values involved. The ALARP principle could be interpreted differently. On one hand an extreme utilitarianism could be anticipated, identifying preference structures and carrying out multi-attribute analyses to optimize the preferences. The alternative interpretation includes a less structured decision analysis, encouraging communication about risk and inherent solutions with involved parties.

The precautionary principles state that in the face of uncertainty one should seek robust solutions in order to avoid terrorist acts and their consequences, with no regard to calculated risks. The precautionary principle is normally related to novel phenomena in which scientific evidence is very weak (Klinke and Renn 2002; Renn 2008). Terrorism risk could easily be categorized as novelty, although very few types of weapon would have lasting global consequences. As Martin Peterson points out: 'the precautionary principle can be interpreted [in this frame] as an analogous epistemic principle which prescribes that it is always more desirable to avoid false negatives than false positives when it comes to assessing risks' (Reported in Renn 2008: 80).

3.2 Discussion of Terrorism Risk Approaches: The PST Case

Risk estimates communicated to the decision makers and the public as objective facts are powerful means. Such analyses are closely connected with decision criteria, which provide a basis for traditional engineering practices. This is a common way of conducting risk management, also when the phenomena are security and terrorism. Even though positivistic approaches encompass engineering judgments and expert opinions, these assessments draw heavily on retrospective hard data, such as observed terrorist attacks. The analysts need to evaluate the relevance of the data material, which is complicated. In order to present the true estimates of terrorism risk related to, for example, Norwegian society, persuasion of the validity of models and underlying assumptions of the risk models also present a challenge. There is a need to clarify uncertainties. There will always be uncertainties related to the prediction of consequences, based on assumptions about for example who the terrorists are, what weapons they have and what their preferred targets are. Decisions are to be made with reference to risk acceptance criteria but since the uncertainties are large the precautionary principle will be relevant.

The Norwegian authorities claim that in any analysis of critical infrastructure subject to terrorism risk it is not possible to assign probabilities, because the uncertainties will be too large (NoU 2006). Their philosophical foundation of risk is thus positivistic and the argument legitimizes the use of the cautionary principle and worst case scenario thinking in terrorism risk management. Consequently, imaginary worst case scenarios rather than probability assessments underpin the decision criteria. This could easily lead to enhanced use of terrorism risk security measures, thus putting aside civil liberties. Bye and Sjue (2008) warn about the Norwegian security services' increased ability to keep people under surveillance and Nordenhaug and Engene (2008) claim that even though no major acts of international terrorism have taken place in Norway, terrorism counter-measures certainly have.

Both PST and the Norwegian Defence have undergone great changes gearing themselves to combat the contemporary terrorism threat. PST describes a hidden enemy driven by extremist attitudes that could be represented by a well-integrated third generation immigrant. The Norwegian Defence on the other hand focuses on terrorism as a threat to free and democratic societies. However, this argument is at odds with assertions that participation in military operations abroad increases the terrorism risk in Norway and that terrorism is a police responsibility within Norwegian borders. Both stakeholders describe a terrorism risk that is societal, catastrophic and can hit 'everyone everywhere'. Terrorism is framed as a risk that society needs to be protected from because the risk is intolerable (Jore and Njå 2009).

The PST has a category of threat levels but has said nothing about when risk reducing measures may be necessary. How the investigations and decision processes are undertaken remains unknown, but the PST occasionally informs the public in a manner that connotes the truth. It is reasonable to question who is involved in the investigations and who challenges the resultant analyses and recommendations. In most cases, the experts performing the risk analysis will be parties other than the politically elected stakeholders. The power to choose options will accordingly be left to parties outside the

democratically elected representatives, for example the defence forces, staff in official security services and researchers (Jore 2007; Jore and Njå 2008).

It could be claimed that the predictive Bayesian approach to terrorism risk as described by Aven (2003) is close to the PST's view on terrorism threat assessments. If PST's description of likelihood is understood as PST's uncertainty related to the occurrence of a terrorist attack, the description could be regarded as coherent with the theory. Again, risk management within a predictive Bayesian context rests on normative managerial processes taking multi-attribute analyses into account to obtain the optimal decision. The major assumptions for risk management processes based on the predictive Bayesian approach are openness, transparency and debate (Watson, 1994). This is a challenge to terrorism risk management that is still waiting to be researched.

4. Discourse Analysis is Needed to Explore the Use of Risk Management in Protecting Society against Terrorism

In the aftermath of 9/11 major research programmes have been initiated both in the USA and in Europe dealing with security matters. Security research in the USA is primarily organized by the Homeland Security Department, established as a response to the 9/11 attacks. The National Consortium for the Study of Terrorism and Responses to Terrorism (START)[2] aims to provide timely guidance on how to disrupt terrorist networks, reduce the incidence of terrorism and enhance the resilience of the US society in the face of the terrorist threat. Several of the projects are directed at estimating the risk of terrorist attacks and gauging the success of counter-measures used by the government. In Europe research is carried out within the seventh frame programme, which includes security[3]. Security calls for emphasis on technological aspects, for example technological solutions for civil protection, increasing the security of infrastructures and utilities, intelligent surveillance and border security, and restoring security and safety in the event of crisis. The hardware, results and recommendations from these research activities imply nearly without exception a conflict with civil liberties. Studies show that people are willing to trade off civil liberties in return for better protection, particularly when the studies are close both in space and time to actual events (Viscusi and Zeckhauser 2003). Citizens do not show the same stress and risk perception when they are more geographically distant from the events and where no major terrorist attack has occurred lately (Lemyre et al. 2006). Viewing terrorism hazards as negligible, however, does not mean that citizens are more likely to oppose the implementation of risk reducing measures that compromise civil liberties.

Terrorism risk literature does not discuss the foundations of risk. For example it is Beck's assumption that traditional risks can be measured objectively in contrast to new risks in the global risk society. In this respect Beck upholds a realistic perspective on risk. Classical risk approaches are also employed by the literature critical to terrorism measures, for example by using the probability of terrorism as proof that terrorism risk in Western society is overemphasized (e.g. Furedi 2006; Jackson 2005). How the terrorism threat

is understood is not only a reflection of the real threat 'out there'. Even if we did have relevant historical data it would not make any sense to base a decision on an estimate based on 'an infinite fictive population of terrorist attacks' since terrorists are strategic, thinking human beings and can adjust their plans in response to security measures. Terrorism risk assessments tend to be qualified judgments. This means that terrorism researchers or risk analysts with competence on the subject could provide interesting analyses but these risk assessments cannot be seen as valid facts. We therefore reject the positivistic risk interpretation.

The Bayesian approach is more promising as a risk management perspective. The risk foundation itself does not promise more than underlying knowledge and arguments over uncertainties related to the occurrence of events. The approach is founded on openness, transparency and debate in the management process (Aven 2003). The prerequisite risk management regime is however instrumental, assessing risk and other attributes relevant to the decision contexts. Decision-making is seen as a process with formal decision and risk analyses providing decision support, followed by an informal managerial judgement and review process resulting in a decision. The managerial judgement and review process remains a 'black box'. This approach needs to be empirically tested. Does the assumption of an instrumental planning process, where the decision makers choose the most rational alternative, hold in real cases? Do actors have their own agendas in the matter of terrorism risk? How are the power aspects evaluated? Who evaluates the quality of the risk analysis and how is it carried out? Who is involved in core discussions about terrorism risks? Do terrorism risk assessments really have a role to play in decision making about terrorism security, or are security measures and other societal changes legitimized by other arguments? If terrorism risk management is seen as identical with precautionary principles and pre-emptive interventions its role should be questioned (Aradau and van Munster 2007; Mythen and Walklate 2008).

What we perceive as a terrorism risk is culturally and socially conditioned, and it is not obvious that the terrorism threat can be mitigated by risk analysis. Terrorists are strategic human beings, and risk analysis might as well be considered a symbolic measure for achieving other goals, for example solidarity with other states or to make a public impression that security is prioritized (Jore and Njå 2008). Although institutional methods of risk assessment may seek to objectively measure threats, the categorizations are themselves the product of cultural values. Security discourses are constructed by dominant institutions such as government, the police and the media (Furedi 2005, 2006). Furthermore, when risk management strategies in the war on terrorism can threaten democratic values the role of risk analysis should be scrutinized from a critical perspective.

Terrorism risk could be seen as a societal change stimulus used by actors in society to strengthen their positions (Jore and Njå 2009). These actors construct a discourse that is designed to achieve a number of key political goals; it empowers the stakeholders in society and shields them from criticism. Political discourses are constructed and employed for specific purposes, and they are an exercise of power whereby actors try to impose their understanding of the phenomenon of terrorism on others (Jackson 2005).

Discourses interpret the phenomenon of terrorism, formulate understandings and constitute their socio-political reality (Nilep and Hodges 2007).

Words are crucial in politics. Why terrorist attacks in the USA should cause an increased use of terrorism counter-measures in Norway is not obvious. There is a need to investigate the arguments behind these societal changes from a perspective that acknowledges the complexity of the phenomenon as terrorism opens the door to different interpretations and different ways of structuring society. What actors in society say about a crisis and the venue they choose when communicating to the public have a disproportionate effect on the public's perception of a crisis (Hajer and Uitermark 2008). The important point is that political discourses are neither neutral nor objective; rather they are always an exercise in social power. They set the parameters of debate and establish the boundaries for possible action. Although discourse theorizing is employed within a range of different epistemological paradigms - poststructuralist, postmodernist, feminist and social constructivist - it is predicated on a shared set of theoretical commitments. Broadly speaking, these include (Jackson 2008):

- an understanding of language as constitutive or productive of meaning,
- an understanding of discourse as structures of signification that construct social realities, particularly in terms of defining subjects and establishing their relational positions within a system of signification,
- an understanding of discourse as being productive of subjects authorized to speak and act, legitimate forms of knowledge and political practices and importantly, common sense within particular social groups and historical settings,
- an understanding of discourse as necessarily exclusionary and silencing of other modes of representation, and
- an understanding of discourse as historically and culturally contingent, inter-textual, open-ended, requiring continuous articulation and re-articulation and therefore, open to destabilization and counter-hegemonic struggle.

Discourse analysis has been used to illuminate how the war on terror is a politically constructed discourse (Jackson 2005), but all the domestic steps and the homeland security regime have not been questioned from a discourse analytical point of view. Several scholars have shown that the state has increased its power at the expense of civil liberties. We think that different kinds of discourse analysis will be excellent tools for building bridges between the normative risk management scholars and social science approaches. This would help to 'open' the black box described as 'informal managerial judgement and review process'. Studies are needed to investigate how terrorism mitigation changes have been legitimized.

Discourse analysis can provide insight into how media, politicians, researchers and other actors in society construct terrorism discourses. Actors in society not only need to comment on the terrorism threat but also to demonstrate that their discourse is more appropriate than that of prospective challengers. For example, Hajer (1995) has developed an argumentative

discourse analytical approach. Argumentative discourse analysis sets out to trace a particular linguistic regularity that can be found in discussions or debates. This is not simply about analysing arguments but much more about analysing politics as a play of positioning at particular sites of discursive production. The argumentative approach acknowledges that language can create new meanings, and hence the discourse fulfils a key role in processes of political change. Politics is conceived of as a struggle for discursive hegemony in which actors try to secure support for their definition of reality. Political discourses are not determined in a 'rational' exchange of arguments. Metaphors, story lines and rhetoric are more likely to dominate the political scene. If actors fail to frame the event in terms that people see as meaningful, social unrest might grow. On the other hand, if they successfully produce conciliating discourse, crises can even strengthen solidarity and generate power (Hajer and Uitermark 2008).

A discourse analysis approach gives insights into how the risk of terrorism is perceived and understood in the historical-political context. The analysis could answer why a particular understanding of terrorism risks at some point gained dominance and is seen as authoritative, while others are discredited (Hajer 1995). Different interpretations of who the terrorists are, what their political motivation might be, target selections, and if the terrorism threat is something that the society can be protected from, are a result of political discourses constructed by political actors in society (Hajer 1995; Jore and Njå 2008, 2009). Different interpretations and comprehensions of the terrorism threat are not only socially constructed discourses; they have different real implications for how society structures itself against terrorism and they can lay the grounds for diminished civil liberties, more state power and even war (Hajer 1995; Jackson 2005; Jore and Njå 2008, 2009; Lewis 2005). Discourses contribute to the shaping of social structures, but discourses are also shaped by them; there is a dialectic relationship between them (Jackson 2005).

5. Conclusions

The role of risk management and risk analysis needs to be questioned in a perspective that recognizes the role of power, institutional interests and the actors' agendas behind the use of risk analysis as decision support. This does not mean that we reject the use of risk analysis in terrorism risk management, but there is a need to research the use of the approaches rather than developing new methodologies and tools. We recommend the predictive Bayesian approach (Aven 2008), since it is the only approach which properly includes the uncertainty dimensions.

Precaution as decision criteria can undermine the use of risk management tools, and risk management tools can also be misused to generate power. Mythen and Walklate (2008) claim that the discourse on terrorism nestles into a broader politics of risk that disproportionately directs economic and political issues and encourages a climate of public anxiety, and the precautionary and pre-emptive risk discourse has legitimized violations of civil liberties. Moreover they call for more empirical investigation and

exhaustive theoretical exploration, and here discourse analysis is a promising tool.

Ericson (2006) claims that we live in a society dominated by the desire to tame risk, and by institutions increasingly organized around risk management (Power 2004). There is a doubt that the risk of terrorism is a threat that can be mitigated through rational analysis. Ericson (2006) emphasizes that there were a number of repeated attacks on American targets prior to 9/11, including one on the World Trade Centre. However, it was the catastrophic events of 9/11 that precipitated the shift in the risk portfolio of Western society. Terrorism is not a new phenomenon but what is new is the focus on risk analysis for managing terrorism risk.

Notes

[1] Collected from PST's homepages; www.pst.politiet.no

[2] START can be viewed on http://www.start.umd.edu/start/research/

[3] EU's 7th frame programme: http://cordis.europa.eu/fp7/security/home_en.html

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