

*Sigve Oltedal, Bjørg-Elin Moen, Hroar Klempe, Torbjørn Rundmo*

# *Explaining risk perception. An evaluation of cultural theory*



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Editor: Torbjørn Rundmo  
Norwegian University of Science and  
Technology, Department of Psychology,  
7491 Trondheim, Norway  
tel. +47-73-976120, +47-73-976256,  
+47-73-591656  
e-mail: torbjorn.rundmo.@svt.ntnu.no  
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## Preface

Cultural theory launched by Mary Douglas (1966, 1978) and Douglas and Wildavsky (1982) has been important in the discussion on risk perception and risk interpretations (Dake, 1991; Wildavsky and Dake, 1990). The core aim of this report is to evaluate the relevance of this theory in risk perception research. Empirical tests of the theory's capability of predicting perceived risk will be presented and discussed. Can cultural adherence and social learning explain how people perceive and understand risk? According to Wildavsky and Dake (1990: 42) the cultural theory of risk is capable to "predict and explain what kind of people will perceive which potential hazards to be how dangerous". However, the empirical support for this theory has been surprisingly meagre and the reasons are discussed in the present report. The report is financed by The Norwegian research Council's RISIT (Risk and Safety in Transport) - program.

Trondheim, April 20<sup>th</sup> 2004

Torbjørn Rundmo



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## Summary

Cultural theory launched by Mary Douglas (1966, 1978) and Douglas and Wildavsky (1982) has been important in the discussion on risk perception and risk interpretations (Dake, 1991; Wildavsky and Dake, 1990). The core aim of this report is to present the subject matter of this theory with respect to risk perception. Empirical tests of the theory's prediction will be presented and discussed. Can cultural adherence and social learning explain how people perceive and understand risk?

Originally, Douglas developed the theory as a neutral instrument where the morphology of societies could be compared irrespectively of their existence in time and space (Boholm, 1996). According to the theory, perceived risk is also closely tied to cultural adherence and social learning. Depending on whether one is socially participating and which groups one belongs to, one will focus on different kinds of risks. People choose what to fear and how much to fear it. Cultural theory aims at explaining how people perceive and act upon the world around them. More specifically the theory claims that this is largely determined by social aspects and cultural adherence. According to Wildavsky and Dake (1990: 42) the cultural theory of risk is capable to "predict and explain what kind of people will perceive which potential hazards to be how dangerous".

If cultural theory is a fine theory for explaining risk perception and interpretation one would also expect it to produce strong research of high quality giving support to the hypothesized explanations (Boholm, 1996). However, the empirical support for this theory has been surprisingly meagre (Raynes, 1992: 84; Sjöberg, 1997). Boholm (1996) has thoroughly discussed some critical points about the cultural theory of risk. The first one is that some of the conclusions related to typology predictions may be contained in the premises and, therefore, such predictions can not be considered to be proper hypotheses. The theory also presupposes a correspondence between "way of life" and individual orientation. Despite the fact that it refrains from using "personality"

as an exploratory concept, cultural theory clearly is related to personality as an explanatory concept. In addition, the theory presupposes a meta-rationality in choosing between “ways of life”. However, very little evidence gives support to the idea that individuals deliberately select their institutional settings (Bourdieu, 1977). There may also be a second reason for meagre empirical evidence of the cultural theory of risk. These findings of empirical evidence supporting a theory depend on appropriate measurement instruments. Perhaps the measurement instrument does not measure the relevant aspects of culture and needs to be expanded to include other aspects. Cultural theory’s explanatory capacity may also be easily overestimated. The theory describes tendencies, dispositions and worldviews. It is unlikely that cultural theory should be able to predict risk perceptions in specific situations. Studies should test the theory across situations to see if any patterns or tendencies reveal themselves. To determine whether worldview and culture can predict risk perception one will need a systematic aggregation of risk situations. As far as the current authors can see, such large-scale studies remain to be done. The concept of culture needs to be clarified. In addition, the instruments of measurement must be developed and compared to findings from studies in different areas. They would benefit from a comparison in a way that makes it possible to see if the worldviews reflect different patterns of risk perceptions, not simply focus upon who obtains the highest level of explained variance.

## 1. Introduction

We are surrounded by potential threats at all times. In most situations, it is possible to identify some aspects as more or less threatening. It can be anything from doing a wrong turn while driving, being assaulted on the street, ran down by a tram or developing asthma from polluted air. People cannot face every risk. Neither can they avoid being exposed to potentially-hazardous risk sources. Since we do not always rate the most risky activities as more dangerous than less risky ones, risk judgments are unlikely to be entirely rational. It is well known that perceived risk, i.e. subjective risk judgements, may deviate from "objective" risk. Humans are influenced by their surroundings and the environment affects cognition as well as behaviour and individual decisions. An influential theory aimed to explain risk perception is cultural theory, which was launched by Mary Douglas (1978). The main objective of the present report is to provide a critical review of this theory.

The study of the link between culture and psychology started in the 19<sup>th</sup> century, perhaps with Comte's six volumes of "cours de philosophie positive" (1830-1842). Since the mid seventies, new ideas about culture and psychology have emerged. Culture is now conceived to be a less static, more dynamic, and "constructed" conception. According to Berry, Poorting and Pandey (1980) "psychology has finally realized that culture has a major role to play in the way psychology is shaped". Humans learn to believe that the standards, principles, perspectives, and explanations that we acquire from our culture are the way to look at the world.

The word "culture" derives from the Latin verb "colore", which usually is bound to the meaning "to cultivate" or "work on". However, the noun "cultura" is only one out of two diversions of the Latin verb. The other is "cultus". While "cultura" is tied to the cultivation of land, "cultus" is the worship of divinity. There is still a close connection between the two cultural forms, primarily because the two nouns have the same lingual root. Moreover, because there was

not a distinct differentiation between the cultivation of the life-giving soil and the life-giving divinity in the epoch of pre-modernity (Fink, 1988) there was neither a clear distinction between nature and culture in earlier times. Perhaps this is best articulated in the Greek way of thinking, where the perception of a close connection between nature and spirit, whether it was human or divine, was prominent in the epoch of pre-modernity. This was expressed in the so-called “theory of correspondence”, which represented a conformity or correspondence between the Creator and the created. That is, the three instances God, world and human. These three were characterized with the same order (logos) and way of thinking, and an investigation of one would necessarily give information about the others. Thereby, it became sufficient to take human conceptions as a starting point to make evaluations of how the Creator and the world were arranged. Thus, the cultural conception was tied to the worshiping of humans and its relationship with God throughout the Christian middle age. There was not an articulated distinction between cultus and cultura in this period (Fink, 1988: 13).

A radical change was brought about with the entry of the modernity in the western world around 1600. In the same manner as Descartes laid the foundation to doubt perceptions as a basis to say something about the world, a more fundamental distinction between nature and culture was created. The modern conception of culture as something “manmade” started to manifest itself in terms of this and created a change in the use of the term. Even though the modern term of culture includes cultivation of land, it did not imply the nature given ground for this cultivation, just the human contribution. Within this background, the term focus on the human ability because it is about what the human itself has capability to create. The premises given from the Creator becomes subordinate or indefinable in size.

With this change in perspective, there is also an evident change in the area of use. It does not characterise the big dimensions as world, universe, or God any longer, but the small local ones like human-made expressions and organisations. This confinement of usage area came with the same confinements of areas of acknowledgement. A broader interest for the human-made, such as language, art, history and the social organisations, and an establishment of these areas of separate scientific disciplines grew, in part, because of an assertion

made by Giambattista Vicos in the beginning of the 1800 century. He claimed that humans do not have the ability to understand more than what humans had made themselves (Vico, 1744/1996): the area of use does once again reflect the constriction of the area of knowledge. The interest for the human-made increased and established these areas as scientific disciplines on the background of “The new science”. With this, a foundation for a ranking was made where the individual was sorted as representing a “high” or a “low” culture. The same goes for different social groups, which makes it possible to rank different more or less culturally developed societies.

In accordance to this, it is vital to stress several conditions. One is that the transmission from the epoch of pre-modernity to the modernity was a gradual and long process, where the reminiscence of the pre-modern way of thinking prevailed long after the rupture on the 17<sup>th</sup> century and extends as far as the present (Østerberg, 2001). August Comte and the consecutive positivism within the social sciences is a fine example in the sense that Comte focus on the social organisation on one side, and the expected, nature given, lawfulness which organisations of society and history would follow on the other. The other is how the development of the term culture creates a foundation for a constructivistic perspective, where the nature given dimension is an indefinable quantity. With this background, the modern understanding of the term risk is far more natural to connect to culture than to nature. The third is that the term culture by it self has gone through changes, and thereby is vital for how it is defined and what cultural theories are derived from it. According to the sociolinguist Rampton (In Press) one operates with four different categories of the term culture: (1) Culture as elite canon (2) Culture as sets of values, beliefs and behaviours (3) Culture as reflection of socio-economic relations (4) Culture as the processes and resources involved in situated, dialogical sense-making (Rampton, In Press).

These categories of definition are not entirely adequate. First, they are unable to capture the pre-modern meaning of the term. This is hardly relevant in the present context. Nevertheless, it represents an understanding that primarily has its roots in the 18<sup>th</sup> century, and it is still relevant in many contexts today. The other category of definition is powerful within psychology. Douglas and Wildavsky (1982) used this in part, but it was more distinctively present in Dake

(1990), and Wildavsky and Dake (1991). The term as it is developed in Douglas and Wildavsky (1982) does primarily belong to the third category above. However, other categories are also present in the term culture.

The fourth category made a foundation for Mary Douglas as a social anthropologist. This category is more open, and was from Rampton's side tied to the post-structuralism and Bakhtinian perspective of language and communication. However, this perspective can be made more common in the sense that it is used about the symbolic exchange in a more general sense (Fornäs, 1992). To understand culture as a symbolic exchange may be a fertile and alternative approach. The foundation for Mary Douglas' theory is in many ways the exchange of symbols, something that is best expressed in Douglas (1970/1996) where she for the first time presents her grid/ group analysis.

The main purpose of this report is to follow this cultural term further, both in the way it is used in risk analysis, but primarily with the same approach as within Cultural Theory. Consequently, it is not only to investigate the empirical validity of the Cultural Theory, but in as much to look closer at how the term is operationalised and whether this operationalisation is in accordance to the term Douglas and Wildavsky (1982) used in the beginning. In addition, the use which Douglas (1970) started with. A possible conflict is perceived even here.

Living requires some kind of experience with dangers – in the modern world dangers is ubiquitous, but they are perceived different by different humans. This diversity may dependent of different things. To enable comprehension of the cultural theory the concept of risk and risk perception requires a closer scrutiny.

## 2. Risk perception

Risk concerns both the probability for and the consequences of the happening of an event (Adams, 1995). People are expected to vary in whether they focus upon probability or consequence (Drottz-Sjöberg, 1991). Most definitions of risk include some sort of a probability estimate for the happening of a negative event (Brun, 1994). According to Adams (1995: 69) "*risk, according to the definitions most commonly found in the safety literature, is the probability of an adverse future event multiplied by its magnitude*".

It may be argued that it is impossible to perceive risk since there is nothing "out there" which can be called "risk" and which can be sensed. Hence, there is no risk perception (Brehmer, 1987). Risk is all about thoughts, beliefs and constructs (Sjöberg, 1979). A person's own estimate of risk may be very different from the "objective" estimate (see e.g. Boholm, 1996). "Objective" risk is the risk that exists independent of an individual's knowledge and worries of the source of the risk (Ulleberg & Rundmo, 1996). To some extent, perceived risk is clearly a reflection of real risk, especially when risks are well-known (Sjöberg, 1995).

The objective risk is calculated from statistics and probability distributions. Objective risks can for instance be the probability of being struck by the lightning or killed in a train derailment. The objective risk source may vary in different cultures; the chance of an avalanche is obviously bigger in some parts of the world than others. The perceived risk concerns how an individual understands and experiences the phenomenon. Many factors may influence perceptions of risk, such as familiarity with the source of danger (Ittelson, 1978), control over the situation (Rachman, 1990), and the dramatic character of the events – rare, striking events tend to be overestimated, while frequency of common events tend to be underestimated (Lichtenstein, Slovic, Fishcoff, Layman & Combs, 1978). For example, even though the actual risk of getting involved in an airplane crash is very small, many people are still afraid to fly.



It is generally estimated that about 90 per cent of accidents can be attributed to human error (McKenna, 1983). It may be important to gain knowledge about significant determinants of peoples' risk judgment. Understanding the determinants of risk perception may give insight about efficient countermeasures to reduce the number of accidents. Risk perception is associated by demands for risk mitigation. Mitigation derives from the word mitigate which means make less severe, violent or painful. Demand for risk mitigation is the demand for risk reducing means put down by the public. Consequently, knowledge about which aspects or characteristics of the risk source which is important for subjective risk judgements may influence such demands and hence also political actions aimed at reducing the risk.

Slovic, Fischhoff and Lichtenstein (1982) found that people remained untouched by the news that a fatal accident occurs once in every 3.5 million car trips. However, they say they will buckle up when the odds are recalculated to show that their lifetime chance of dying in a car crash is one percent. This suggests that people's risk judgements are related to cognitive processes, e.g. how one is able to comprehend the given information. Kahneman and Tversky's (2000) prospect theory of decision-making support this way of thinking.

A particularly important aspect of risk is its cumulative nature when exposure to a hazard occurs repeatedly over time (Slovic, 2000). The degree to which people understand cumulative risk has important theoretical and social implications. Slovic (2000) investigated smokers and found denial of short-term risks was frequent. The denial was coupled with a tendency observed in other studies for young smokers to underestimate the addictive properties of tobacco. Likewise, Deery (1999) found that young novice drivers were characterised by perceiving relatively low levels of risk in specific driving situations compared to other groups of drivers. According to Brown and Groeger (1988) the cause of the overrepresentation of young novice drivers in specific types of traffic accidents, e.g. those associated with speeding, is that they underestimate the probability of specific risks caused by these traffic situations. Young drivers perceive hazards less holistically (Milech et al., 1989; Deery, 1999) and concentrate on the danger rather than on the difficulty involved in carrying out particular manoeuvres (Groeger and Chapman, 1996). Glik et al. (1999) showed

that young men did not perceive themselves to be at greater risk for traffic accidents compared to other groups. Consistent with this, Gregersen (1996) found that young drivers tended to overestimate their own driving skills and Sival et al. (1989) showed that they underestimate hazards in traffic.

Personal risk must be distinguished from general risk. People tend to estimate the general risks to be larger than the personal ones. Most people rate themselves as to be a better driver compared to the average driver. According to McKenna (1993) the vast majority rate the probability for themselves to experience negative events to be less compared to the average citizen. This may be an example of unrealistic optimism. For people who have experienced accidents or suffered other loss due to negative events unrealistic optimism is weaker and in some cases reverses to an *unrealistic pessimism* (Dolinski, Gromski & Zawisza, 1987). Studies have shown that unrealistic optimism quickly reinstates itself (Burger & Palmer, 1992). This indicates that the presence of pessimism is related to other issues than experience.

The theory about unrealistic optimism is unchallenged and moderators have been found. One of them is a potential group size effect of personal risk judgments. Price (2001) looked at group size effect and found that the size of the comparison group might help to explain unrealistic optimism. A member of a large group is generally judged to be at higher risk compared to a member of a small group. This might help to explain why people scoring high on unrealistic optimism tend to judge themselves to be at lower risk for negative events than their peers. Another aspect found to influence the degree of optimism is the cultural adherence of people. Research on cultural differences has suggested that the benefits of cognitive and motivational tendencies to maintain positive illusions may be specific to particular cultures (Heine & Lehman, 1995). Cultures may differ in their emphasis on two types of tasks: Independence (i.e. task related to agency and autonomy) and interdependence (i.e. tasks related to communion and affiliation). Interdependent construal of self is characterized by an emphasis on the interrelatedness of the individual to others and to the environment. The interdependent society displays less optimism on behalf of themselves and more optimism on behalf of the group they belong to (Heine & Lehman, 1995; Lajunen, Corry, Summala & Hartley, 1998). Heine and Lehman

(1995) investigated the difference between optimism among Canadians and Japanese students. They found Canadians to be significantly more optimistic than Japanese. The Japanese assessed interdependent events to be more severe than did Canadians and Japanese showed unrealistic optimism only in one specific domain: relative-likelihood estimates for negative events. Their conclusion was that there were pronounced cultural differences with respect to optimism between the two cultures. Lajunen, Corry, Summala and Hartley (1998) and Hayakawa, Fiskbeck and Fishbeck (2000) confirmed this result.

Another possible explanation may be biological. Numerous studies have found men to assess risk differently than women (i.e. Boholm, 1998; Byrnes, Miller, & Schafer, 1999; Davidson & Freudenburg, 1996; DeJoy, 1992; Flynn, Slovic, & Mertz, 1994; Glendon, Dorn, Davis, Matthews, & Taylor, 1996). This was in turn by Flynn, Slovic, and Mertz (1994). They found that white men judged risk to be less compared to women. This difference was not found between non-white men and white women. In addition, Finucane, Slovic, Mertz, Flynn and Satterfield (2000) found significant gender differences in relation to trust. Risk tends to be judged to be less by women and by white people compared to Afro Americans.

The study of risk perception has a cognitive stance with focus upon perception as mainly a cognitive process (Sjöberg, 1996). This approach makes up the foundation of the psychometric paradigm in risk perception. According to this paradigm risk can be understood as a function of general properties of the risk object (Sjöberg, 1996). There are certain hallmarks in the objects that make people rate them as risky or not risky. Fischhoff, Slovic, Lichtenstein, Read and Combs (2000) have suggested nine general properties of activities or technologies important for the subjective risk judgement. These are: (1) Voluntariness of risk, (2) immediacy of effect, (3) knowledge about the risk by the person who are exposed to the potentially-hazardous risk source, (4) knowledge about the risk in science, (5) control over the risk, (6) newness, i.e. are the risks new and novel or old and familiar ones, (7) chronic/ catastrophic, that is a risk that may kill people one at a time (chronic risk) or a risk that can kill a large number of people at once (catastrophic), (8) common/ dread, i.e. whether people have learned to live with and can think about the risk reasonably

and calmly, or is it a risk that people have great dread for, on the level of a gut reaction, and (9) severity of consequences (see table1).

The degree to which these factors are related to potentially-hazardous activities or technologies determines people's risk judgements. However, the approach has been criticized for not considering other potential factor involved than merely properties of the risk object. Sjöberg (1999) found level of perceived risk to be related to the probability of harm or injury, whilst demand for risk reduction was related mostly to the expected severity of “consequences”, should harm occur.

Table 1: Rating scales:

**Voluntariness of risk:** do people get into these risky situations voluntarily? If for a single item some of the risks are voluntary undertaken and some are not, mark an appropriate spot towards the centre of the scale (1 = voluntary; 7 = involuntary)

**Immediacy of effect:** to what extent is the risk of death immediate – or is death likely to occur at some later time (1 = immediate; 7= delayed)

**Knowledge of risk:** to what extent are the risks known precisely by the persons who are exposed to those risks (1 = known precisely; 7= not known precisely).

**Knowledge of risk:** to what extent are the risks known to science (1 = known precisely; 7 = not known precisely)

**Control over risk:** if you are exposed to the risk of each activity or technology, to what extent can you, by personal skill or diligence, avoid death while engaging in the activity (1 = uncontrollable; 7 = controllable)

**Newness:** are the risks new, novel ones or old, familiar ones (1 = new; 7 = old)

**Chronic – catastrophic:** is this a risk that kills people one at a time (chronic) or a risk that kills large numbers of people at once (1 = chronic; 7 = catastrophic)

**Common - dread:** is this a risk that people have learned to live with and can think about reasonably calmly, or is it one that people have great dread for – on the level of gut reaction (1 = common; 7 = dread).

**Severity of consequences:** when the risk from the activity is realized in the form of a mishap or illness, how likely is it that the consequence will be fatal (1 = certain not to be fatal; 7 = certain to be fatal).

In recent years trust has gained more attention within risk research. According to Sjöberg (2001) trust is often held to be of crucial importance for the understanding of risk perception. Trust in an expert, an agency, or a corporation has been assumed to be determined by perceptions of a number of attributes among them competence and expertise (Peters, Covello & McCallum, 1997). Biel and Dahlstrand (1995) found that attitude towards nuclear power and trust in experts and authorities had a substantial impact on risk perception, while personal knowledge about nuclear waste disposal had no effect.

At some point there will always be necessary for the perceiving subject to make his or her own interpretation and judging of the risk. Cognitive approaches to subjective risk judgement have been unable to answer questions like “why is one technology feared in some societies or social situations, but not in others?” (Rippl, 2002). Besides the obvious answer of an actual risk source, there has been a gradually increased approval for the fact that risk perception is a social phenomenon which cannot be studied in isolation (Boholm, 1996). Since most humans are social beings it is natural to consider the social context of a person when considering his or hers perception of risk. Because risk perception does not occur in a social vacuum one cannot account for how people perceive and understand risks without also considering the social contexts. According to Mary Douglas (1978) risk perception is not governed by personality traits, needs, preferences, or properties of the risk objects. It is a socially, or culturally, constructed phenomenon. What is perceived as dangerous, and how much risk to accept, is a function of ones cultural adherence and social learning. Such adherences are described in Douglas’ cultural theory (Douglas, 1978; Douglas & Wildavsky, 1982; Thompson, Ellis & Wildasvsky 1990). This report will present the subject matter of the cultural theory with respect to risk perception. Empirical tests of the theory’s prediction will be presented and discussed. Can cultural adherence and social learning explain how people perceive and understand risk?

### 3. Cultural theory

Culture is based on the uniquely human capacity to classify experiences, encode such classifications symbolically, and teach such abstractions to others. It is usually acquired through enculturation, the process through which an older generation induces and compels a younger generation to reproduce the established lifestyle. Consequently, culture is embedded in a person's way of life<sup>1</sup>, i.e. the “way of life” is a central idea in and it derives from Mary Douglas’s theory of group and grid (1978). Originally, she developed the theory as a neutral instrument where the morphology of societies could be compared irrespectively of their existence in time and space (Boholm, 1996). Douglas made a distinction between cultural bias, defined as ‘shared values and beliefs’ on the one hand, and social relations, defined as ‘patterns of interpersonal relations’, on the other. According to Thompson et al. (1990: 1), ‘way of life’ was defined as “a combination of social relation and cultural bias”. Cultural theory is a general sociological theory. It is constructed according to tenets of positivistic reasoning, by way of deduction from a limited number of basic axioms, regarding human social beings and their interaction (Boholm, 1996).

Cultural theory aims at explaining how people perceive and act upon the world around them. More specifically the theory claims that this is largely determined by social aspects and cultural adherence. The basis of cultural theory is Douglas’ grid-group typology (Douglas, 1978; Thompson et al., 1990). According to Douglas, variation in social participation can be adequately accounted for by the dynamics between the two dimensions *group* and *grid*.

“The group itself is defined in terms of the claims it makes over its constituent members, the boundary it draws around them, the rights it confers on them to use its name and other protections, and the levies and constraints it applies. Group is one obvious environmental setting, but we seem unable to conceive of the individual’s environment if it is not a group of some kind” (Douglas, 1978: 8).

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<sup>1</sup> [http://www.encyclopedia.com/html/section/culture\\_theatureofculture.asp](http://www.encyclopedia.com/html/section/culture_theatureofculture.asp)

In short, group refers to whether an individual is member of bonded social units and how absorbing the group's activities are on the individual. The other dimension of the grid-group theory is grid. It was explained by Douglas in the following manner:

“The term grid suggests the cross-hatch of rules to which individuals are subject in course of their interaction. As a dimension, it shows a progressive change in the mode of control. At the strong end, there are visible rules about space and time related to social roles; at the other end, near zero, the formal classifications fade, and finally vanish. At the strong end of grid, individuals do not, as such freely transact with one another. An explicit set of institutionalized classifications keep them apart and regulate their interactions, restricting their options” (Douglas, 1978: 8).

To summarize, grid refers to what degree a social context is regulated and restrictive in regard to the individuals' behaviour. A typical high-grid situation is a trial, where each person has very limited behavioural options. As grid weakens, individuals are free to act and are increasingly expected to negotiate their own social relations. When the interaction between grid and group changes, this may influence peoples' social participation. The grid-group analysis describes different modes of social control.

If the dimensions are placed in a two-axis system, from low to high, four outcomes occurs (figure 1). These represent different kinds of social environments. The dimension a person belongs to will guide his or her interaction with the environment. Each of them, in addition to certain social relation, is therefore described as one of four *worldviews* or ways of life. These are termed *individualistic*-, *egalitarian*-, *hierarchical*-, and *fatalistic* worldviews, and they have a self-preserving pattern of risk perceptions. This means that individuals perceive things that endanger their own way of life as risky. The individualistic worldview is characterized by low group and grid. Egalitarians are members of high group and low grid cultures, high grid and high group defines the hierarchical way of life, while high grid and low group is the fatalistic worldview.

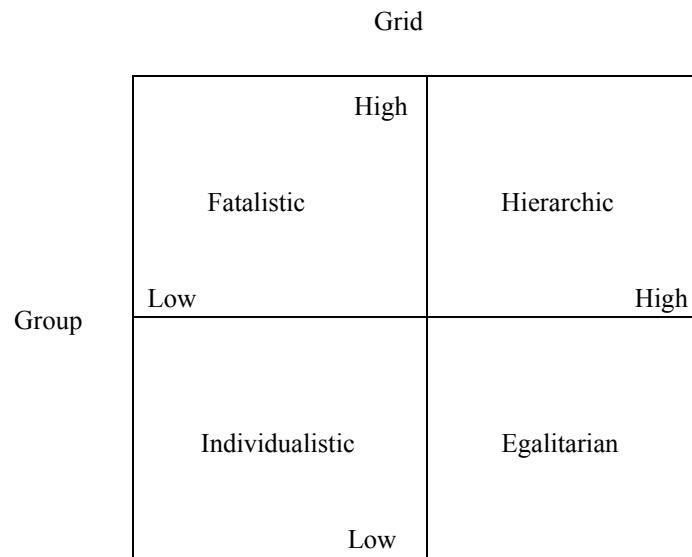


Figure 1: Douglas' grid - group model

An important and fundamental factor concerning peoples risk perceptions are their general attitudes towards nature (Thompson et al., 1990). According to cultural theory, thoughts about the nature and other people are interwoven with worldview and way of life. Thompson et al. (1990) used people's attitudes towards ecological systems as a basis for their analysis. While some want to use pesticides on forests and plants to prevent diseases, others believe that nature is capable of dealing with its own problems without human interventions. Even though people show different attitudes towards nature, this is not coincidental; people act in accordance to one of five so-called "myths of nature" (Thompson et al., 1990). These are general views about how the nature works and how it will respond to human interventions. With the grid/group dimensions, the different views have several practical implications for how people understand and perceive risk.

Individualists fear things that might obstruct their individual freedom. The ultimate obstacle is war, where certain people are physically controlled by others. Less dramatic happenings, like getting a socialist government, will also be regarded as a threat for the individualist. Individualists support market liberalism and believe that people should have the opportunity to keep their



economical gains for themselves. Politically, individualists would place to the right. The individualist sees the nature as self-preserving, with the ability to re-establish its own status quo. Hence, people do not need to care a great deal about how nature is treated. In general, individualists see risk is an opportunity as long as it does not limit freedom.

Egalitarians fear development that may increase the inequalities amongst people. They tend to be sceptical to expert knowledge because they suspect that experts and strong institutions might misuse their authority. Egalitarians are placed politically to the left, and support political action aiming to increase social equality, like placing the highest taxes on the society's richest members. Their view of nature is different from the individualists view. Egalitarians see the nature as fragile and vulnerable to human interventions. This makes egalitarians alert about pollution and new technologies that might change the state of nature and will generally oppose risk that will inflict irreversible dangers on many people or future generations.

Hierarchical cultures emphasize the "natural order" of the society and the perseverance of this order. They fear such things as social commotion, demonstrations, and crime. Hierarchists have a great deal of faith in expert knowledge. The hierarchist see nature as largely self-preserving, though within strict and rigid limits. If people cross these limits, nature will no longer be able to heal itself, and this may have dramatic consequences. Hence, hierarchists accept risk as long as decisions about these are justified by government or experts.

Fatalists take little part in social life, though they feel tied and regulated by social groups they do not belong to. This makes the fatalist quite indifferent about risk, what he fear and not is mostly decided by others. The fatalist would rather be unaware of dangers, since it is assumed to be unavoidable to them anyway. Nature does not give the fatalist any reliable feedback regarding whether people are doing things right or wrong. It seems to operate much like a lottery, where people must deal with whatever problem comes along. In general, fatalists try not to know or worry about things they think they can't do anything about.

In addition to the four worldviews described above, one group does not fit this pattern. These people have cut all relations to their social environment and live more or less like “hermits” (Thompson et al., 1990). They are withdrawn from others and oppose all the other worldviews.

The five worldviews, or ways of life, make up the central part of the cultural theory. Cultural theory draws focus away from concepts such as risk and safety, and towards social institutions. To deal with risk in a reasonable manner one must understand the underlying mechanisms. According to Thompson et al. (1990), people feel the need to justify their own way of life. If individualism is to be a useful and meaningful way of dealing with the world, nature has to be manipulated and controllable through skills. The egalitarian’s way of life does not need a controllable nature, but they should be able to account for it to know what nature can and cannot handle. For the hierarchist nature is fertile and full of possibilities, but within strict boundaries. The fatalist needs an unpredictable and coincidental nature, or his fatalistic way of life would not work. Wildavsky and Dake (1990) sums up the cultural theory by stating that individuals are active organizers of their own perceptions, who choose what to fear and how much to fear it.

Wildavsky and Dake (1990) as well as Dake (1991) have tried to empirically verify the cultural theory. They claim that hierarchical-, egalitarian-, and individualistic ways of life can predict a broad pattern of risk perceptions. Their measure of fatalism is not reported to have been tested empirically in these studies. The relation between fatalism and risk perception has received limited attention from researchers (Marris, Langford & O’Riordan, 1998), but Rippl (2002) tested all four worldviews and found the dimension to be important. Questions about fatalism has also been used in the offshore-industry and has been found to function well (Rundmo, 1995).

Risk perception was measured in relation to technology and environmental issues, war, social deviance and economy. To investigate the relationships between these and cultural adherence, Wildavsky and Dake (1990) developed new measurements for individual adherence to the three ways of life (hierarchical, egalitarian, and individualistic). The questions are shown in Table 2.

Table 2. The cultural measure (Dake 1990).

*Hierarchy (15 items)*

I think there should be more discipline in the youth of today

I would support the introduction of compulsory National Service

I am more strict than most people about what is right and wrong (-)

We should have stronger armed forces than we do now

The police should have the right to listen to private phone calls when investigating crime

Those in power often withhold information about things which are harmful to us (-)

One of the problems with people is that they challenge authority too often

It is important to preserve our custom and heritage

I think it is important to carry on family traditions

In my household, family members have their own places at the dinner table

I always sort out clothes into separate categories before washing

I value regular routines highly

I think being on time is important

My time-tabling of meals is haphazard (-)

I like to plan carefully so that financial risks are not taken

*Individualism (9 items)*

In a fair system people with more ability should earn more

A free society can only exist by giving companies the opportunity to prosper

If a person has the get-up-and-go to acquire wealth, that person should have the right to enjoy it

It is just as well that life tends to sort out those who try harder from those who don't

Continued economic growth is the answer to improved quality of life

This country would be better off if we didn't worry so much about how equal people are

Making money is the main reason for hard work (-)

I don't join clubs of any kind (-)

I tend to be sceptical of health food fads (-)

Table 2. The cultural measure (Dake 1990). (cont).

*Egalitarianism (11 items)*

If people in this country were treated more equally we would have fewer problems (-)

The government should make sure everyone has a good standard of living

Those who get ahead should be taxed more to support the less fortunate

I would support a tax change that made people with large incomes pay more

The world could be a more peaceful place if its wealth were divided more equally among nations

Social security tends to stop people from trying harder to get on (-)

Racial discrimination is a very serious problem in our society (-)

What this country needs is a “fairness revolution” to make the distribution of goods more equal

Most of the meals I eat are vegetarian (-)

Health requirements are very important in my choice of foods (-)

I prefer simple and unprocessed foods (-)

*Fatalism (11 items)*

There is no use in doing things for other people – you only get in in the neck in the long run

Cooperating with others rarely works (-)

The future is too uncertain for a person to make serious plans

I have often been treated unfairly (-)

A person is better off if he or she doesn't trust anyone

I don't worry about politics because I can't influence things very much

Most people make friends only because friends are useful to them (-)

I feel that life is like lottery

Even if you work hard you never know if that will help you do better

It seems to me that, whoever you vote for, things go on pretty much the same

I have few financial investments (-)

Items marked with (-) did not work well in Germany (Rippl, 2002).

The index for hierarchy is based on patriotism (“I think there should be more discipline in the youth of today”), law and order (“the police should be allowed to listen in on private phone calls when investigating crime”) and ethical standards (“I am more strict about what’s right and wrong than most people”). In addition, assertions expressing concern about the lack of discipline among young people nowadays are included.

The individualism index expresses support of continued economical growth as the key to quality of life, and private profits as the main rationale for hard work: “In a fair system people with more ability should earn more”. The index contains assertions in favour of a weaker government control; “if a man has the get-up-and-go to acquire wealth, that person should have the right to enjoy it.”

The index for egalitarianism intends to measure attitudes towards social equality of conditions: “The world could be a more peaceful place if the wealth were divided more equally among nations”; “I would support a tax system that made people with large incomes pay more”.

In the study, cultural adherence was found to be the best predictor of risk perception. Other predictors tested were personality, economy, knowledge, political attitudes, and level of knowledge. Dake (1991) claimed that his study gave strong support to the cultural theory of risk perception.

The majority of studies carried out more recently have failed to confirm the findings of Dake and Wildavsky. Marris et al. (1998) compared the cultural theory and the psychometric paradigm. The sample consisted of 129 residents from Norwich, England, who participated through interviews made in their homes. The psychometric theory was superior in respect to explained variance. Of 14 different risks,  $R^2$  for cultural theory was significant only for five, with the highest  $R^2$  of 0.12. The model was based on an index of all the four ways of life taken together. The same study also did a correlational analysis between the 14 risks and each of the worldviews. The correlations were low to moderate, with 0.34 as the highest. However, Marris et al. (1998) claim that the four worldviews seem to relate to risk perceptions in accordance to distinct patterns. Sjöberg (1997) compared judgments of risk between a Swedish and a Brazilian sample. Data was collected from 102 teachers in Sao Paolo and 94 teachers in equivalent

subjects in Stockholm. Contrary to the predictions made by cultural theory, the two groups judged risks in a similar fashion, despite assumed cultural differences. Correlations between cultural adherence and risk perception were low. Sjöberg explains this by suggesting that risk perception is tied to real risks rather than assumptions and cultural values.

Palmer (1996) used Dake's operationalisation on a sample of 115 undergraduate students of psychology in California, US. Her findings were similar to those previously reported. Individualists, hierarchists and egalitarians did not differ significantly in their judgments of 10 potential risks. However, one of Palmer's findings stands out. Cultural adherence explained much more of the variance in risk perception in Palmer's study than reported by others.

Peters and Slovic (1996) suggested that different ways of life could function as orienting dispositions, guiding people's perception and understanding of a complex and risky phenomenon, e.g. nuclear power. Their study was based on a sample of 1512 English-speaking respondents who answered a half-hour long telephone interview. 15 questions were designed as a measure to what degree subjects thought the four ways of life were supportive of nuclear power.

Altogether, researchers have only to a small degree presented confirming evidence of the cultural theory's predictions. Most have reported that the theory only explains a minor part of the variance in how people perceive risks.



## 4. Discussion

Since cultural theory was introduced, it has met both support and critique. According to Miller (1996), some of the problems of cultural theory represent the complexity of culture: a) multiple functions of cultural meanings, b) differentiated and dynamic nature of culture c) relationship to ecological and socio-political factors. Much of the critique has been based on the low level of explanatory power of the theory (for a more extensive review see Boholm (1996) and Sjöberg (1995). According to Tansey (2004), the theory is embedded in a much deeper sociological theory, and has been taken out of the original context, and thereby been misunderstood.

As shown above, the findings of Dake (1990) and Wildavsky and Dake (1991) have not been replicated. Their way of seeing cultural adherence does not seem to be a very precise predictor of risk perception. There are several possible explanations for this. Two basic ones can be distinguished (Boholm, 1996). The first, and for cultural theory the most serious option, is that it's simply wrong, that cultural adherence is unimportant for how people perceive and understand risks other than through more or less coincidental connections. The other option is that the theory has not been adequately operationalized, and hence its predictions have not been tested according to the right conditions. To account for cultural theory's lack of explanatory power, this should be taken into consideration. The theory has weak or vague parts. The same goes for the studies designed to test it. A fundamental weakness about Dake's operationalisation is that he used very few items to measure cultural adherence. To measure the hierarchical, individualistic, egalitarian, and fatalistic worldviews, Dake used 15, 9, 11, and 11 items, respectively (in comparison, McCrae and Costa (1992) uses 48 items to measure each of their five personality traits). This makes it difficult to capture differences between the worldviews, which again makes it difficult to separate them from risk perception.



The mobility view of culture makes it possible to adhere to different cultures in different situations or parts of life. When people answer a questionnaire, which of the cultures determines their answers? If someone is hierarchical at home but individualistic at work, how will this be captured by a questionnaire that presupposes people to adhere to only one culture? Marris et al. (1998) used Dake's measures for cultural adherence. In their sample they found 22 egalitarians, nine individualists, five hierarchists and five fatalists. The remaining 81 respondents showed mixed adherences, and only 32 per cent adhered clearly to only one of the worldviews. Similar findings were made by Sjöberg (1995) in Sweden and Brenot and Bonnefus in France (cited in Marris et al., 1998). This can imply that cultural adherence is not an inherent individual characteristic that can be captured by questionnaires like the one used by Dake (Marris et al., 1998). One possible improvement of the questions may be to specify which group a person belongs to when he or she answers the question (i.e. when you as a driver/athlete/police-officer assess the following..). The theory of group size effect supports this thinking (Price, 2001; Ho & Leung, 1998). Rippl (2002) found fatalists to show a higher risk perception with regard to individual dangers such as personal unemployment and becoming infected with AIDS. This result is also found for egalitarians. Individualists showed the lowest level of perception for all types of risks. This finding may imply strong self-confidence and perception of individual control. This suggests that it is important to differ between risk that influence many and risk that influence individuals. Hayakawa, Fiskbeck and Fishbeck (2000) found that a difference may appear in different groups, dependent of the degree of interdependence. Groups that are highly dependent of each other would be expected to have a lower degree of individual optimism, and higher on optimism on behalf of the group. If these findings are correct questions should be adapted to the different cultures or groups. It may be hypothesised that this difference also may exist in groups that are highly dependent of each other. The reason is that highly interdependent groups would be expected to have a lower degree of individual optimism and higher on optimism on behalf of the group.

This is supported by Marris et al. (1998: 637), which stated, "if questionnaires are to be used at all, respondents should be chosen according to

their adherence to particular institutions with distinctive grid and group characteristics". If Marris et al.'s (1998) suggestion is correct one have to ask what Dake's items in fact measure. According to Sjöberg (2000) they are merely examples of scales measuring political attitudes and values, which relate to risk perception in a traditional sense, that is, not very well. On the other hand, other explanations are also possible. Rippl (2002) also criticize Dake's approach because he addresses attitude measurement, which is well established in the social sciences. The aspect of social relations or behavioural patterns is disregarded. In this sense, attitude measures are used as indirect indicators of the more complex latent construct "cultural type".

Many of the items used by Dake bear a great resemblance to items used in personality tests, such as the NEO-PI-R (McCrae & Costa, 1992). For instance, Dake used among others the following items to measure the worldview fatalism: "There is no use in doing things for other people, you only get it in the neck in the long run" and "I believe that most people would take advantage of you if you let them". In the NEO-PI-R (McCrae & Costa, 1992), the following items are intended to measure the trait agreeableness: "I tend to be cynical and skeptical of others' intentions" and "I believe that most people would take advantage of them if you let them". Even though the exact wording differs, it seems plausible that these four items may reflect a common underlying factor. Still they claim to measure substantially different things. Dake claims that his items measure cultural adherence, McCrae and Costa claim that their items measure personality, which is individual preferences, dispositions, and behavioural tendencies. This is consistent with the critics of Dake's questionnaire, claiming that he has not managed to capture Douglas' concept of culture by administering questionnaires to individuals (Rippl, 2002; Marris et al., 1998). It may be that Dake is measuring personality as much as cultural adherence. An analysis of the connections between Douglas' worldviews and the traits included in the five-factor model would be interesting and could reveal whether some of the worldviews relates to certain traits. If one follows this train of thought personality measures what a person views himself or herself to be whereas the cultural questions measure the perception he or she has about different subjects. The problem may be that the distinctions between the two are indistinct.

Additional reasons for the lack of explanatory power of the theory can be hypothesised. One possibility is that people are so different that a general theory is not sufficient. “With dominance of natural science models of explanation, psychology has tended to focus on the identification of laws of behaviour that are invariant across time and historical context (Miller, 1997: 87). Maybe the whole concept of a joint cultural theory is naïve. The creation of four groups is wrong and very optimistic. The fact that there is no difference in the way questions are formulated between individualistic and collectivistic groups may cause some of the problems.

Douglas’ initial study was conducted in an environment with a very strong leader where tradition in the society held the members in their place. One possibility is that society may have changed a lot since the initial theory was suggested by Douglas. May be it was more correct before the globalisation? Poortinga and Pandey (1997: 10) said “culture becomes manifest in shared constraints that limit the behaviour repertoire available to members of a certain group in a way different from individuals belonging to some other group”. This indicates a difference between the cultures where the cultural theory initially came up and the cultures the theory is applied to today. The development of more extensive communication between different cultures may also contribute to less diversity between cultures and perhaps more diversity within the same culture. We need to recognise individual differences within cultural groups – and individual differences among these. The history of the particular culture is also important. The objective history may cause a difference in the level of trust in a society and this will probably affect the degree of hierarchy one finds in a culture. If there is dissatisfaction with the government the level of hierarchy may decrease. Several studies have found the level of trust to be closely related to risk perception and this may be closely related to the actual experience of to the inhabitants in a country (Biel & Dahlstrand, 1995). In some cultures, the head of the state may be the only person the society has to relate to and the level of trust in this person may be high.

The use of the term culture may seem somewhat ambiguous. It is not clear whether the cultural adherence is set or whether it is continually negotiable through the grid-group dynamics. Marris et al. (1998) refer to this ambiguity as

stability versus mobility, and this is problematic in several ways. Firstly, different views on culture call for different causal explanations. If culture is seen as preset, this can be used to explain why and how people perceive risks as a culturally learned phenomenon. In contrast, if culture is thought to be in constant fluctuation, people's cultural adherence can be a result of their risk perception. One chooses a culture that fits one's own patterns of risk perception. The culture becomes a result of what people fear. Secondly, an unclear understanding of what culture means makes it difficult to operationalise the theory, which might be a reason for why cultural theory has explained so little of the variance in risk perception. Thirdly, it should be made a distinction between whether something is socially *learned* or socially *determined*. In Norway, experience has thought us that avalanches and floods are dangerous and should be avoided, but it would be absurd to claim that culture made them dangerous. This is related to the previous discussion between objective and subjective risk.

Marris et al. (1998: 645) reported that "cultural theory does not really claim to explain such abstract ratings or risk", but each of the worldviews correlated systematically with certain risk perceptions. The associations were significant; however, no correlation coefficients were presented in their paper.

Some of the most basic knowledge from any introductory course in psychological methods is that significant results do not necessarily indicate a meaningful effect on the population. Sjöberg (2003;1997) argues that Dake treat his correlations in this way. Significant correlations are made synonymous with strong correlations. Of course, this does not mean that Dake's findings are meaningless or coincidental, only they seem to be weaker than he has claimed. It may therefore be correct to say that they give some partial support for cultural theory, but no strong support as contended by Dake. Marris et al. (1998) also used a relatively small sample of respondents. They acknowledged this fact, but argued that the sample showed sufficient variance in certain socio-economic variables to be seen as representative. Off course, this can be correct. Nevertheless, a study using only 129 respondents will still be more vulnerable for accidental circumstances than studies using bigger samples, as long as the sampling are done in a similar fashion.

As mentioned, Palmer (1996) reported that the explanatory power of cultural theory was high. For the worldviews hierarchy, individualism and egalitarianism she obtained explained variances ( $R^2$ ) of 0.67, 0.54 and 0.62, respectively. These numbers are far greater than what other studies have found. However, if Palmer's results are closer scrutinized, it becomes apparent that these results are caused by strong correlations between each of the worldviews and the dimension "harm", or severity of the risk's consequences. The other correlations were weak and sporadic like other's findings.

Another argument opposing the cultural theory comes from Sjöberg. He criticizes the way the data were analysed. The use of means when analysing the data are inappropriate.

Certain aspects put the organism in greater danger than other aspects, irrespectively of worldview, social learning, or cultural adherence. It would not be adaptive to be unafraid of such things. We are certainly biologically predisposed to fear many activities and technologies. There is a reason why humans fear heights whereas turtles do not. This is because turtles are less exposed to heavy falls to lower levels. People who fall often or have been involved in accidents involving falls do not seem to develop a fear of heights from that (Kennair, 2003). This may simply be a result of a natural selection, where the fittest creature survive.

That culture and social learning shall account for such a broad spectre of perceived risks as cultural theory claims, may be biologically unlikely. Fear has always had a biological function, namely to protect the organism against harm (Sjöberg, 1997). Thereby, a possible explanation may be biological, but this was disputed by Flynn, Slovic, and Mertz (1994). A very few studies have examined the reasons for the gender difference in risk perception. However, there are some indications that masculinity and femininity may be related to perceived risk.

It has been pointed out that the consequences of events are important for how we perceive risks (Sjöberg, 2000; Drottz-Sjöberg, 1991), which might be a biological adaptation since it is the severity of the consequences that, ultimately, defines how dangerous an event is. Biologically, what can be more useful than a system that motivates flight from and avoidance of potentially dangerous situations (Nesse, 2001)? Palmer's findings do not necessarily support cultural

theory; it might just as much reflect a general human characteristic. Still of course, precisely *what* is dangerous is to a large degree socially learned (though not socially determined). As a Norwegian tourist in the Amazon, you would not know a lethal snake from a harmless one, but you would know which one of them you would like to avoid. It might be the survival ability of humans Palmer has captured; people do not need a certain cultural adherence for wanting to protect themselves from harmful situations.

Why has cultural theory made such a big impact despite its relatively low explanatory and predictive power? According to Sjöberg, it may simply be due to the power of persuasion, that the supporters of cultural theory have been good advocates and managed to promote their views in a convincing way. In addition, the basics of the theory is easily comprehensible and might seem intuitively reasonable, which of course will make it easier to gain accept.

To assess cultural theory, question from Dake (1992) was extended with questions considered relevant to Norwegian conditions and more closely related to transport safety (see table 3). In addition, nine questions tied to language and communication was added to investigate the symbolic exchange in a more general sense.

Table 3: Cultural theory, adapted version

Indicate to what extent you agree or disagree to the following statements:

**Hierarchy:**

I think there should be more discipline in the youth of today

We should have stronger armed forces than we do now

I am more strict than most people about what is right and wrong

The police should have the right to listen to private phone calls

It is acceptable that those investigating accidents within transport detain information

One of the problems with people is that they challenge authority too often

It is important to preserve our custom and heritage

I think it is important to carry on family traditions

I think being on time is important

I trust the experts when they tell me what means of transportation is the safest

Regulations and laws to prevent accidents are often ignored and broken

New technology will solve the problems within transport

The proper authorities show sufficient responsibility for safety in the transport sector

**Individualism**

In a fair system people with more ability should earn more

A free society can only exist by giving companies the opportunity to prosper

Continued economic growth is the answer to improved quality of life

This country would be better off if we didn't worry so much about how equal people are

It is fair that with higher status you can make yourself more comfortable

The most intelligent ones should get the most responsibility in the society

People that work hard are not rewarded enough

To get to the top is a result of hard work

Individual needs to tend to an important task is in many instances superior to safety in transport

Sometimes the transport companies has to prioritize economy before safety to be able to do business

If one is to follow all safety regulations and rules, society would come to a halt

**Egalitarian**

If people in this country were treated more equally we would have fewer problems

The government should make sure everyone has a good standard of living

I should support a tax change that made people with large incomes pay more

What this country needs is a "fairness revolution" to make the distribution of goods more equal

Those that make the most money should get the highest tickets when they break rules and regulations

Appropriate measures to improve safety in transport are often stopped if they are too costly

Table 3: Cultural theory, adapted version (cont)

**Fatalism**

There is no use in doing things for other people – you only get in the neck in the long run

Cooperating with others rarely works

I have often been treated unfairly

I don't worry about politics because I can't influence things very much

I feel that life is like lottery

Even if you work hard you never know if that will help you do better

A person is better off if he or she doesn't trust anyone

Accidents will always happen because people are unreliable

It is not wise to call attention to others' violations of safety rules and statues

**New measurement**

I have many ideas about measures that could prevent accidents within transport

I like to discuss measures that can prevent accidents

The mass media collect the necessary information when they focus on measures in transport

The mass media has a short termed focus when they write about accidents and disaster within transport

Politicians collect all the information necessary to initiate appropriate measures in transport

When politicians make decisions in transport safety is always prioritized

Politicians use all necessary information to come to appropriate decisions

Accident in transport can only be avoided if human behaviour is changed radically

Laws and regulations about safety is only a disclaimer of liability from the government





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## **Explaining risk perception. An evaluation of cultural theory**

Cultural theory launched by Mary Douglas (1966, 1978) and Douglas and Wildavsky (1982) has been important in the discussion on risk perception and risk interpretations (Dake, 1991; Wildavsky and Dake, 1990). The core aim of this report is to evaluate the relevance of this theory in risk perception research. Empirical tests of the theory's capability of predicting perceived risk will be presented and discussed. Can cultural adherence and social learning explain how people perceive and understand risk? According to Wildavsky and Dake (1990: 42) the cultural theory of risk is capable to "predict and explain what kind of people will perceive which potential hazards to be how dangerous". However, the empirical support for this theory has been surprisingly meagre and the reasons are discussed in the present report. The report is financed by The Norwegian Research Council's RISIT (Risk and Safety in Transport) - program.

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